

Centre for Applied Economic Research (CAER)

Annual Report 2019





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1. Centre for Applied Economic Research (CAER) - key facts

1.1 Presiding faculty

UNSW Business School

1.2 Schools, centres, faculties and other organizations with which CAER interacts

CAER has significant linkages with the academia, industry and government. The following table summarizes the schools, centres, faculties and other organizations with which CAER interacted during 2019. The nature of the interactions is also indicated. Further descriptions of the interactions are provided in the sections to follow of this report.

Entity	Nature of interaction		
Within UNSW			
School of Economics, UNSW Business School	On-going engagement: CAER's management, majority of CAER members, and part of the Steering Committee members are academics at the school; Collaboration and coordination of teaching and research supervision activities; Provision of in-kind facilities.		
School of Banking and Finance, UNSW Business School	On-going engagement with the Real Estate Initiative; Part of CAER members and the Steering Committee members are academics at the school; Collaboration and coordination of teaching activities.		
UNSW Law	On-going engagement with the Law and Economics Initiative; Part of CAER members are located at the school; Coordination of research supervision activities.		
Outside UNSW			
Australian Bureau of Statistics	On-going engagement with the Economic Measurement Initiative.		
Australian Bureau of Agricultural and Resource Economics and Sciences	On-going engagement with the Economic Measurement Initiative.		
Department of Communications and the Arts	On-going engagement with the Economic Measurement Initiative.		
OECD	On-going engagement with the Economic Measurement Initiative.		
U.S. Bureau of Economic Analysis	On-going engagement with the Economic Measurement Initiative.		
The Australian National University and the University of Melbourne	Collaboration with the Economic Measurement Initiative on an Australian Research Council Discovery Project Grant.		
School of Economics, the University of Queensland	On-going engagement with the Economic Measurement Initiative and the Real Estate Initiative.		
The Australian Treasury	On-going engagement with the Economic Measurement Initiative and the Real Estate Initiative.		
Department of Industry Innovation and Science	On-going engagement with the Economic Measurement Initiative.		

Entity	Nature of interaction
Outside UNSW - Cont.	
Statistics Netherlands	On-going engagement with the Economic Measurement Initiative.
Herbert Smith Freehills law firm (Sydney)	On-going engagement with the Law and Economics Initiative; Key donor of the Law and Economics Initiative.
Economic Statistics Branch, United Nations Statistics Division	On-going engagement with the Economic Measurement Initiative.

1.3 Governance and management of CAER

Director

Professor Kevin Fox, School of Economics, UNSW

Deputy Director

Professor Richard Holden, School of Economics, UNSW

Steering Committee

Professor Richard Dunford (Acting Associate Dean Research) - Chair

Professor Kevin Fox (Director, CAER)

Professor Jerry Parwada (School of Banking and Finance)

Mr Tim Harcourt (J.W. Nevile Fellow in Economics)

Ms Maree Magafas (School Manager, School of Taxation and Business Law)

1.4 CAER's research initiatives and their members in 2019

CAER's research activities are carried out through its research initiatives where each initiative focuses on a specialised research area. The following is a list of CAER's research initiatives and their members during 2019. The research agenda of each initiative is described in section 2 of this report.

Economic Measurement Initiative 2019

Professor Kevin Fox - School of Economics, UNSW

Professor Erwin Diewert - School of Economics, UNSW and Vancouver School of Economics, the University of British Columbia

Associate Professor Glenn Otto - School of Economics, UNSW

Herbert Smith Freehills Initiative on Law and Economics 2019

Professor Richard Holden, Initiative Director - School of Economics, UNSW

Professor Rosalind Dixon, Initiative Deputy Director - UNSW Law

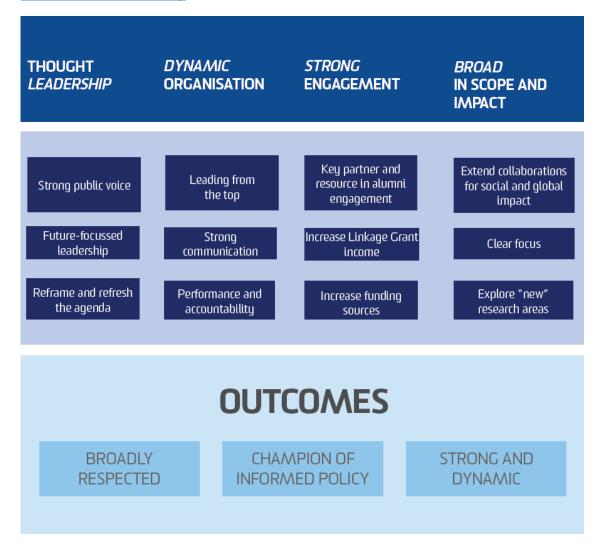
The **Real Estate Initiative** continued with primarily teaching and industry engagement activities in 2019, as it was being wound down in preparation for the launch of a new initiative from 2020; see section 9.2. The donor impact report to Mr Andrew Roberts, whose donation enabled this initiative, was prepared by the UNSW Philanthropy Office and submitted to him by the Chancellor.

1.5 CAER's administrative staff in 2019

Kala Miranda continued to be employed as a full-time administrator of CAER in 2019. She was hired to assist CAER's Director in the administration of the Centre and in coordinating the research activities of CAER's initiatives. Her position was funded by CAER.

Carmit Schwartz continued as a part-time Senior Research Officer, during 2019. Carmit was hired to provide research assistance to CAER's Director as well as help manage relationships between ABS, Department of Industry, Innovation and Science and the ATO, in one of the emerging research projects around Business Longitudinal Analytical Data Environment (BLADE). Administrative support was also provided by the UNSW Business School, mainly consisting of HR, IT, finance and marketing support.

1.6 CAER's mission and history



History

Founded in 1976, CAER is one of the oldest centres in the University and the first centre to be established in the former Faculty of Commerce and Economics (now the UNSW Business School). CAER's primary emphasis is on applied economic research relevant to policy issues. For more than thirty years a significant body of such research has been carried out and the results published in academic journals, books and the Centre's own publications. CAER's work is valued by its internal and external stakeholders and its years of built up impact have contributed to its brand name achieving a high level of external recognition. CAER is proud of its contribution to UNSW and the broader community. It remains relevant, having changed with times, and continues to attract top class international visitors, research funding and research collaborations.

2. CAER's performance in relation to its identified objectives

The following is a summary of CAER's performance in relation to its identified objectives during 2019. A detailed description of CAER's operations in 2019 is provided in the following sections of this report.

Earry out, encourage and enhance applied economic research with an interdisciplinary and multidisciplinary focus that addresses current policy issues both within Australia and globally.

In 2019 CAER's research activities were carried out and advanced through the following research initiatives:

Economic Measurement Initiative

The appropriate measurement of economic variables is of high importance as data of economic variables is used by a wide range of researchers and policy decision makers, spanning the social sciences, humanities and the physical sciences. Therefore, the research undertaken by the Economic Measurement Initiative is dedicated to improving measurement techniques of economic variables to more accurately reveal empirical facts. To achieve its aim the initiative applies advanced and innovative tools from economic theory, econometrics, aggregation theory, experimental economics, mathematics, and statistics. The initiative research areas include: performance measurement, inflation measurement, index number theory, functional form specification and measurement issues in international comparisons.

Law and Economics Initiative

The Herbert Smith Freehills Initiative on Law and Economics is a collaboration between CAER, UNSW Business School, UNSW Law and the Herbert Smith Freehills law firm (Sydney). Its main goals are to help establish law and economics in the Australian academia, begin a dialogue with practitioners about developments in the field and developments in practice, and to establish UNSW as a key leader in the field. The research of the initiative aims to analyse and understand law and legal institutions from economic perspectives rather than the legal realistic tradition. This is achieved by applying the latest developments in the field of economics, including the incorporation of tools from labour economics and the insights of information and behavioural economics on the limits of neo-classical economic models.

CAER's diverse research activities clearly indicate its role in leading research that crosses discipline boundaries, and as such it adds great value to UNSW research capabilities, supports UNSW's research strength "Law, Business and Economics", and significantly contributes to promoting the UNSW research brand.

Encourage and support collaborative research across schools and faculties both at the national and the international level.

CAER's collaborative research during 2019 is demonstrated by its following undertakings:

- Dr Ben Milligan was appointed to UNSW (from UCL) as a Scientia Fellow with a joint affiliation with CAER, the Environmental Law Cluster (UNSW Law), and the Centre for Ecosystem Science (UNSW Science). His interdisciplinary research, teaching and advisory work focus on:
 - Use of environmental information in public policymaking in particular public sector accounting for environmental assets and ecosystem services using standardised statistical frameworks and approaches, and cross-sectoral development planning informed by natural capital and green growth approaches and perspectives.
 - Design of legal, institutional and policy frameworks for sustainable development

 including a focus on integrated governance of transnational economic sectors
 (marine, mining, energy), and national implementation of multilateral commitments
 concerning the environment.

- In 2019 CAER supported domestic and international collaborations and stimulated its research activities by hosting three distinguished visitors.
- As a research centre, CAER's collaborative activities are mainly concentrated on research.
 However, CAER also undertakes educational collaborative activities where they are deemed
 appropriate in achieving its mission. In 2019 Professor Kevin Fox delivered a course on
 Economic Measurement as part of the Economic Measurement Initiative. Dr Nigel Stapledon
 member of the Real Estate Initiative, delivered a course offered as part of the UNSW Business
 School's Real Estate major. Professor Rosalind Dixon member of the Law and Economics
 Initiative delivered a course on Economic analysis of the Law.
- > Support and facilitate research training and career opportunities for outstanding Australian and international students and researchers.

During 2019 CAER members have supervised 5 Honours and 10 PhD students. Many junior academic and government researchers participated in the Economic Measurement Group Workshop.

> <u>Build and enhance UNSW research capacity and outcomes through stimulating network</u> opportunities and exposure to cutting-edge research.

CAER's commitment to building and enhancing UNSW research capacity and outcomes is shown by the following activities undertaken in 2019:

Visitors

In 2019 CAER supported domestic and international collaboration by hosting three visitors. These visits of distinguished and internationally–recognized visitors assist stimulating CAER's research activities and provide staff and students the possibility of interactions with leading researchers in diverse areas of investigation. Among other activities, these visits usually involve a formal presentation given by the visitor.

Conferences, workshops and special events

In 2019, the EMG Workshop was run over two days, continuing the success which has led it to become a regular and well-attended event of international standing. The workshop is run as part of CAER's objective of helping academics and students engage with government and industry and contributing to their development as internationally recognised researchers. Each year the workshop involves academics from overseas and around Australia, and representatives from the public and private sectors.

Academic, industry and government engagements

In 2019 CAER continued to foster and expand its linkages with the broader academic community, industry and the public sector:

Academic engagements

- Professors Rosalind Dixon and Richard Holden were both academic co-leads of UNSW Grand Challenge on Inequality.
- Professor Ricard Holden participated as a panel member of UNSW Business School's experts who analysed the 2019 Federal Budget and its implications, "BusinessThink Federal Budget Roundtable 2019" on 4th April, at the Business Lounge, UNSW Business School.

Industry engagements

 As part of its teaching program, the Real Estate Initiative hosted Bryan Reid (Vice President, Research, MSCI), as a guest lecturer in Professor Kevin Fox's ECON4309/6309 Economic Measurement course in the first term 2019. In his lecture Bryan discussed the methodologies

- employed by MSCI in producing real estate related regional and global indexes, benchmarks, performance modelling, data metrics and risk analytics.
- In 2019 Dr Nigel Stapledon continued his appointment as Chief Advisor at MacroPlan-Dimasi, a firm located at Sydney's CBD and provides a range of property related services, such as research, economics, planning, spatial analysis and advisory, critical to the formulation of successful development projects.

Government engagements

- Professor Kevin Fox, Advisor to the Australian Treasury.
- Professor Kevin Fox advised the Australian Bureau of Statistics on land price measurement.
- Professor Kevin Fox, member of the Australian Bureau of Statistics Methodology Advisory Committee,
- Professor Kevin Fox, member of the Australian Bureau of Statistics Productivity Measurement Reference Group (PMRG).
- Professor Kevin Fox, Academic Representative, Economic Data and Analysis Network (EDAN) Governance Committee, Department of Industry, Innovation and Science.
- Professor Kevin Fox met with the Innovation and Metrics Review Taskforce, Department of Industry, Innovation and Science to provide advice in relation to innovation metrics and the data underpinning them as part of the "Innovation and Science Australia 2030 Plan".
- Professor Kevin Fox met on multiple occasions with the Department of Agriculture and Water Resources to provide advice on research relating to land valuation.
- Raise the profile, around Australia and internationally, of applied economic research at UNSW.

In 2019 CAER continued to create impact through the following activities:

Publications

To enhance the profile of UNSW's high-impact research and researchers CAER publishes and communicates its research achievements in journals and outlets of the highest standing internationally. In 2019 members of CAER edited one book, published three book chapters and twelve articles in highly regarded international refereed journals.

Conferences, workshops and special events

In 2019 CAER organized the EMG Workshop. The EMG workshop is such, as these raise the profile of applied economic research at UNSW in the broader community and strengthen CAER's position as a leading research centre in the region.

Professional engagements and scholarly achievements

The professional engagements and scholarly achievements attained by CAER members in 2019 further contributed to its community impact. In particular,

- Professor Kevin Fox, Advisor to the Australian Treasury.
- Professor Kevin Fox, member of working group at UN/IMF/OECD/World Bank/Eurostat
 Intersecretariat on Digitalisation, including leading the subgroup on the valuation of free digital
 assets and services.
- Professor Kevin Fox, Associate Editor, Journal of Productivity Analysis.
- Professor Kevin Fox, Editorial Board member, Review of Income and Wealth (2019-2021 term).

- Professor Kevin Fox, President-Elect and Treasurer of the International Association for Research in Income and Wealth (IARIW), (2019-2020 term).
- Professor Kevin Fox, Chair, Panel B of the Academy of the Social Sciences in Australia.
 (Panel B represents Fellows of the Academy from Accounting, Economics, Economic History, Statistics and Marketing).
- Professor Kevin Fox, member of the Policy and Advocacy Committee of the Academy of the Social Sciences in Australia. (2016-2019 term).
- Professor Kevin Fox, member of the Council of the International Association for Research in Income and Wealth (IARIW). (2016-2020 term).
- Professor Kevin Fox, invited discussant, Reserve Bank of Australia 2019 Quantitative, Macroeconomic Workshop, November 2019, Sydney.
- Professor Kevin Fox, Invited Speaker, Statistics Netherlands, The Hague, May 2019.
- Professor Kevin Fox, Invited Speaker, Statistics Norway, Oslo, May 2019.
- Professor Kevin Fox, Invited Speaker, U.K. Office for National Statistics, Newport, Wales, 2 May 2019.
- Professor Kevin Fox, Invited Speaker, ESCoE Conference on Economic Measurement, King's College, London, May 2019.
- Professor Kevin Fox, Invited Discussant: 2019 Reserve Bank of Australia Conference, "Low Wage Growth", Sydney, 4-5 April 2019.
- Professor Richard Holden, editor of the Journal of Law and Economics. Professor
- Rosalind Dixon, editor of a Hart Publishing series on Comparative Constitutional Law.
- Professors Rosalind Dixon and Richard Holden were panelist at the Festival of Dangerous Ideas.
- Professor Ricard Holden participated as a panel member of UNSW Business School's experts who analysed the 2019 Federal Budget and its implications, "BusinessThink Federal Budget Roundtable 2019" on 4th April, at the Business Lounge, UNSW Business School.

It is evident that CAER's work is valued by external stakeholders and its brand name has achieved a significant level of recognition.

Media engagement

To raise the profile of CAER and UNSW, members of CAER's research initiatives were actively engaged with the media and were extensively interviewed on various topical issues during 2019. In addition to Professor Holden's on-going media engagement on SkyNews Australia, the Australian Financial Review and the Conversation, there were seventy media engagements during the year, with media engagements taking place almost every month.

In summary, CAER delivers its stated mission and objectives in a financially sustainable manner and continues to add significant value to UNSW.

3. CAER's planning for the coming year 2020

A review of the existing research initiatives commenced, to respond to new opportunities.

New Initiative-

The possibility of a new initiative on Competition, Policy and Regulation (CPR) utilising BLADE Data were explored in 2019. Kevin Fox and Richard Holden have teamed up to lead the research, commencing in 2020. It is also noteworthy that our current engagement with the RBA, Treasury, Department of Industry, Innovation and Science is around BLADE data.

4. Statement of financial performance certified by the UNSW Business School's Finance Manager for the year ended 31 December 2019.

Ctr for Applied Econ				UN	SN N E Y
Statement of Financial Performance	F	2019	2018	Difference	
For the Year Ended December 2019	Note	\$'000	\$'000	\$'000	×
REVENUE					
Research Revenue:	1	174	217	(43)	-20%
Donations & Bequest - Draw downs		18	100	(82)	-82%
UNSW Contributions			-	**	-
Faculty Contributions	2	8	5	3	63%
Other Restricted Revenue	3	- 12	-		
Commercial Activity - Fees for Service		- 12			
Sundry Other Revenue		8	-	8	9
Total Revenue		208	322	(114)	-35%
EXPENSE					
Salaries, Oncosts and other staff costs		216	165	51	31%
Scholarship Stipends		5	3	3	100%
Contract & Consulting Services		0	1	(0)	-56%
Repairs and Maintenance			-	-	-
Consumables		10	5	5	121%
Travel		29	96	(67)	-70%
Equipment Non Capitalised		10	2	8	338%
Entertainment		(0)	2	(2)	-110%
Marketing		1	-	1	*
Miscellaneous Expenses		(16)	2	(17)	-939%
Total Non-People Costs		39	109	(70)	-64%
Total Expenses		255	274	(19)	-7%
TOTAL CONTRIBUTION - SURPLUS/(DEFICIT)		\$ (47)	\$ 48	(95)	-198%
Depreciation				-	francis
SURPLUS / (DEFICIT) after Depreciation		\$ (47)	\$ 48	(95)	-198%
Cashflow Funded Capital Expenditure (CAPEX)					
NOTES: Revenue in Advance will be noted in Creditors & Other Liabilities. Research Revenue generated (cash basis). Category 1 Research Revenue therein		\$ 174 174	\$ 217 217	(43) (43)	
UNSW Budget model includes other revenue items					
Teaching Revenue			Mary Mary		
Block Grants					
Indirect Cost Recoveries	01				
Other Research Revenue includes internal fund transfers.					
Restricted Funds - Cash at year end	- 8	\$ 163	\$ 210	(47)	
Funds available in Division of Advancement	- 10		Several Assessment	Carried and	

	3	2019	2018	
As at December 2019	Note	\$000	\$000	
UNSW Australia Internal Cash	6	156	206	
Accounts Receivable	7	-	-	
Sundry Assets		(0)	(0)	
Investments			*	
Property Plant & Equipment	8	0	0	
Creditors and Other Liabilities	1	(0)	(0)	
NET ASSETS		\$ 156	\$ 207	
UNSW has central provisions in respect of payments made Such provisions will not be reflected in this Centre's Stat	ement of Financ			

Additional notes:

- The expenses of the Law and Economics Initiative are administrated through an FC101 project on UNSW accounts. Every year funds from the UNSW Foundation accounts are transferred to the FC101 project to cover the expenses and appear as donation income in the FC101 project. On the 31st of December 2019 the remaining donation balance within the UNSW Foundation accounts of the Law and Economics Initiative was \$46,209.
- CAER would like to acknowledge the generous support of \$6,000 from the UNSW Business School's Research Office for the EMG Workshop 2019. The support was transferred into CAER's operating project and was incorporated in the above annual financial statement.

5. Details of research grants and projects associated with CAER during 2019

The following is a list of research grants and projects held by CAER's research initiatives in 2019 as part of their activities¹. CAER members are marked in bold.

- The Herbert Smith Freehills donation is administered by CAER and is the foundation funding for the Law and Economics Initiative. At the end of 2019 the remaining balance was \$46,209.
- The New Economic Policy Initiative donation funding of \$20,00 a year is also administered by CAER, in support of research by R. Holden and R. Dixon, co-leads of the Law and Economic Initiative.
- Australian Research Council Discovery Grant, 2015-2019 (extended to 2020), "Productivity Measurement, Drivers and Trends: A New Analytical Framework", \$551,400, investigators: K.J. Fox and W.E. Diewert. The project aims to advance new concepts and methods for productivity measurement that have the potential to improve policy and national welfare, with special attention to: productivity in the mining industry, the increased holding of precautionary cash balances by firms during financial crises, innovative examination of firm productivity dynamics, and a more realistic approach to capitalisation of research and development and other intangible investments. The project is part of the research agenda of the Economic Measurement Initiative. Funds of this project are administrated by CAER.
- Australian Research Council Discovery Grant, 2017-2019 (extended to 2020), "Natural Resources and Ecosystem Services in Productivity Measurement", \$320,000, investigators: K.J. Fox, R.Q. Grafton, C. Obst and W.E. Diewert. This project aims to significantly advance the understanding of sources of productivity growth through addressing theoretical and practical problems in the economics of natural resources and ecosystem services. A key issue is the valuation of non-renewable resources and ecosystem services, acknowledging their contributions to economic activity and the impact on national income from their depletion and degradation. This then leads to new approaches to incorporating natural resource depletion and degradation into productivity analysis. Theory and practice for aggregate, regional and industry level analysis will be developed with the goal of better informing environmental, innovation and industry policy.

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¹ Research grants and projects which CAER members obtained outside the activities of CAER's research initiatives are excluded from the list.

6. Statement of in-kind contributions, cash contributions, infrastructure and other resources provided to CAER during 2019

6.1 <u>In-kind contributions</u>

Estimated value of CAER members contribution to CAER's activities -by research initiatives²

CAER member	Type of Activity	Value of Contribution
Professor Kevin Fox	Economic Measurement	64,022
Professor Erwin Diewert	Initiative activities	
Associate Professor Glenn Otto		
Professor Richard Holden	Law and Economics	56,008
Professor Rosalind Dixon	Initiative activities	
Total in-kind		120,030

Estimated value of in-kind contribution to CAER's administration3

	Type of Activity	Value of Contribution
Professor Kevin Fox	Director	46,671
Professor Richard Holden	Deputy Director	16,033
Professor Richard Dunford (acting ADR and chair)	Steering Committee	
Professor Jerry Parwada (Head, School of Banking and Finance)		
Mr Tim Harcourt (J.W. Nevile Fellow in Economics)		
Ms Maree Magafas (School Manager, (School of Taxation & Business Law)		
UNSW Business School administrative support	HR, IT, finance and marketing support	13,113
Total in-kind		75,817

² CAER members whose salary was paid by funds held within CAER's department ID are excluded from the table. ³ Administrative support which was funded by CAER's funds is excluded from the table.

6.2 Cash contributions4

Entity	Purpose	Cash Contribution
School of Economics	Support for the EMG Workshop 2019	\$10,000
Total cash		\$10,000

6.3 Infrastructure and other resources provided to CAER

CAER continue to share the allocated office space in the Quadrangle Building (Quad 1039) with the Industrial Relations Research Centre (IRRC).

Dr Stapledon was allocated an office within this space while the other office is reserved to CAER's visitors.

The remaining four workstations are reserved to CAER's postgraduate students. The rest of CAER members provided their own office space (including computers) on or off campus. The School of Economics provided office space and printer/photocopier facilities for CAER administrative staff.

CAER DATA Lab -

The DATA Lab is set up in one of the offices in the CAER space. This is a result of collaboration with the ABS, DIIS and Treasury around analysis of the new Australian firm-level database (BLADE).

CAER was required to put in place strict security arrangements in the setup of the lab to the satisfaction of the ABS staff who carried out an on-site inspection. This is a unique arrangement and is viewed by the ABS as a test case.

In 2019, the DATA Lab was accessible to 2 PhD students, 2 Honours students, and a Research Associate. Access to the data is only permissible after completing mandatory training at the ABS Sydney offices.

⁴ The following table reports only cash contributions which were made available to CAER and which were administrated by the contributing entity. Cash contributions which were transferred into CAER's financial projects are reported as part of CAER's annual financial statement in section 4 above.

7. Details of publications, professional engagements and scholarly achievements associated with CAER during 2019.

7.1 Research output of CAER members

The following is a list of research output attained by CAER members in 2019 as part of their initiative activities. CAER members are marked in bold.

Books

Books - edited

Book Chapters

W.E. Diewert; Fox KJ, 2019, "Productivity Indexes and National Statistics: Theory, Methods and Challenges," in W. Greene and T. ten Raa (eds.), The Palgrave Handbook of Economic Performance Analysis, Palgrave Macmillian, Chapter 18, 2019.

Dixon, R, "Constitutional Non-Transformation? Socioeconomic Rights Beyond the Poor," Katharine G Young (ed), *The Future of Economic and Social Rights*, Cambridge University Press, Chapter 4, 2019.

Dixon, R, "Constitutional Dialogue: Democracy, Rights, Institutions" (ed. with Gregoire Webber and Geoffrey Sigalet), *Constitutional Dialogue*, Cambridge University Press, Chapter 6, 2019.

Refereed Journal Articles

W.E. Diewert; **Fox KJ**, 2019, "A Decomposition of U.S. Business Sector TFP Growth into Technical Progress and Cost Efficiency Components,"_Journal of Productivity Analysis 50, 71{84, 2019}.

W.E. Diewert; **Fox KJ**, 2019, "Addendum to Output Growth and Inflation Across Space and Time," EURONA Eurostat Review on National Accounts and Macroeconomic Indicators, Issue No 2/2019, 71{80, 2019}.

W.E. Diewert; Fox KJ, 2019, 'Alternative User Costs, Productivity and Inequality in US Business Sectors' in W.H. Greene, L.A. Khalaf, P. Makdissi, R. Sickles, and M-C. Voia (eds.), Productivity and Inequality, Springer, 21–69.

Fox KJ, 2019, 'The ET Interview: Professor W. Erwin Diewert' Econometric Theory 34, pp. 509-542.

Fox KJ, 2019, 'What Do We Know About the Productivity Slowdown? Evidence from Australian Industry Data' International Productivity Monitor, pp. 149 – 156.

Akerlof R; Holden R, 2019, 'Capital Assembly', Journal of Law, Economics, and Organization, vol. 35, pp. 489 – 512.

Dixon R, 2019, 'Rule of Law Teleology: Against the Misuse and Abuse of Rule of Law Rhetoric', *Hague Journal on the Rule of Law*, vol. 11, pp. 461 – 464.

Dixon R, 2019, 'The forms, functions, and varieties of weak(ened) judicial review', *ICON-International Journal of Constitutional Law*, vol. 17, pp. 904 – 930.

Dixon R; Landau D, 2019, '1989-2019: From democratic to abusive constitutional borrowing', *International Journal of Constitutional Law*, vol. 17, pp. 489 – 496.

Dixon R; Jackson V, 2019, 'Hybrid constitutional courts: Foreign judges on national constitutional courts', *Columbia Journal of Transnational Law*, vol. 57, pp. 283 – 356

Dixon R; Baldwin G, 2019, 'Globalizing constitutional moments? A reflection on the Japanese article 9 debate', *American Journal of Comparative Law*, vol. 67, pp. 145 – 176.

Landau DE; **Dixon R**; Roznai Y, 2019, 'From an unconstitutional constitutional amendment to an unconstitutional constitution? Lessons from Honduras', *Global Constitutionalism*, vol. 8, pp. 40 – 70.

Other Research Output

K.J. Fox, E. Brynjolfsson, A. Collis, W.E. Diewert and F. Eggers, "GDP-B: Accounting for the Value of New and Free Goods in the Digital Economy," NBER Working Paper 25695, Cambridge, MA. Selected for AEA Papers & Proceedings, 2020.

W.E. Diewert; Fox KJ, 2019, "Substitution Bias in Multilateral Methods for CPI Construction Using Scanner Data," UNSW Business School Research Paper No. 2019-13.

Diewert, WE; **Fox KJ**, Schreyer P, 2019, "The Digital Economy, New Products and Consumer Welfare", ESCoE Discussion Paper 18-16.

7.2 Professional engagements and scholarly achievements of CAER members

The following is a list of professional engagements and scholarly achievements attained by CAER members in 2019 as part of their research initiative activities. CAER members are marked in bold.

Editorial activities

- Professor Kevin Fox, Associate Editor, Journal of Productivity Analysis.
- Professor Richard Holden, editor of the Journal of Law and Economics.
- Professor Rosalind Dixon, editor of a Hart Publishing series on Comparative Constitutional Law.

Professional memberships:

Rosalind Dixon was elected as Fellow of Australian Academy of Arts and Social Sciences.

Invited speaker/discussant/chair/participant

- Professor Kevin Fox, discussant of "The Rise of Market Power and the Macroeconomic Implications", Reserve Bank of Australia Quantitative Macroeconomics Workshop, Sydney, 12-13 December 2019.
- Professor Kevin Fox, Invited presenter "Experimental Economics and the New Commodities Problem", NBER Summer Institute, July 2019
- Professor Kevin Fox, Invited Presenter 4th Annual Conference of The OECD Global Forum on Productivity 20-21 June, Sydney
- Professor Kevin Fox, Invited Presenter: Statistics Netherlands, The Hague, 16 May 2019.
- Professor Kevin Fox, Invited Presenter: Statistics Norway, Oslo, 13-14 May 2019.
- Professor Kevin Fox, Invited Presenter: U.K. Office for National Statistics, Newport, Wales, 2 May 2019.
- Professor Kevin Fox, Invited Discussant: 2019 Reserve Bank of Australia Conference, "Low Wage Growth", Sydney, 4-5 April 2019.
- Professor Richard Holden Invited speaker Asia-Pacific Industrial Organization Conference, Tokyo, Dec. 2019.
- Professor Richard Holden, Invited speaker San Francisco Blockchain Week, Nov. 2019
- Professor Richard Holden, Panelist, ICON-S, Santiago, Chile, July 2019
- Professor Richard Holden, Invited speaker, Festival of Dangerous Tax ideas May 2019
- Professor Richard Holden, Invited speaker, Luohan Academy/Alibaba conference, Hangzhou,
 Jun. 2019 (NB. 10 invited speakers of whom 6 were Nobel Laureates).
- Professor Richard Holden, Seminar Speaker, ANU, April 2019
- Professor Richard Holden, Seminar Speaker, UQ, March 2019
- Professor Richard Holden, Seminar speaker, Columbia Law School, Jan. 2019
- Professor Rosalind Dixon, Invited speaker at ICON-S Santiago, July 2019
- Professor Rosalind Dixon Invited speaker at Chicago 57th St bookstore, January 2019

Members/fellows of committees/organizations:

• In 2019, **Rosalind Dixon** was elected as co-president of the International Society of Public Law.

Scholarly achievements

- Professor Kevin Fox, Advisor to the Australian Treasury.
- Professor Kevin Fox, member of working group at UN/IMF/OECD/World Bank/Eurostat
 Intersecretariat on Digitalisation, including leading the subgroup on the valuation of free digital
 assets and services.
- Professor Kevin Fox, Associate Editor, Journal of Productivity Analysis.
- Professor Kevin Fox, Editorial Board member, Review of Income and Wealth (2019-2021 term).
- Professor Kevin Fox, President-Elect and Treasurer of the International Association for Research in Income and Wealth (IARIW), (2019-2020 term).

- Professor Kevin Fox, Chair, Panel B of the Academy of the Social Sciences in Australia.
 (Panel B represents Fellows of the Academy from Accounting, Economics, Economic History, Statistics and Marketing).
- Professor Kevin Fox, member of the Policy and Advocacy Committee of the Academy of the Social Sciences in Australia. (2016-2019 term).
- Professor Kevin Fox, member of the Council of the International Association for Research in Income and Wealth (IARIW). (2016-2020 term).
- Professor Kevin Fox, invited discussant, Reserve Bank of Australia 2019 Quantitative, Macroeconomic Workshop, November 2019, Sydney.
- Professor Kevin Fox, Invited Discussant: 2019 Reserve Bank of Australia Conference, "Low Wage Growth", Sydney, 4-5 April 2019.
- Professor Richard Holden, editor of the Journal of Law and Economics. Professor
- Rosalind Dixon, editor of a Hart Publishing series on Comparative Constitutional Law.
- Professors Rosalind Dixon and Richard Holden were panelist at the Festival of Dangerous Ideas.
- Professor Ricard Holden participated as a panel member of UNSW Business School's experts who analysed the 2019 Federal Budget and its implications, "BusinessThink Federal Budget Roundtable 2019" on 4th April, at the Business Lounge, UNSW Business School.

8. Details of CAER's engagement with the academia, government, industry and broader community

The following sections provide details of CAER's activities undertaken in 2019 to accomplish its aims of providing a stimulus to the research undertaken at UNSW, supporting research students and early career academics, encouraging collaborative research and raising the profile of applied economic research at UNSW in the broader community.

8.1 Conferences, workshops and special events

EMG Workshop 2019

The Economic Measurement Initiative of CAER hosted its nineteenth annual international workshop on the 5th & 6th December 2019 at UNSW main campus. The aim of the workshop is to create a genuine engagement between academics, statistical agencies researchers, government policy makers and industry representatives from all around the world, leading to an improved understanding of economic measurement and the potential impact on policy. The workshop was supported by the Australian Research Council, UNSW Business School and the School of Economics.

The workshop featured an outstanding program consisting of the following speakers:

Erwin Diewert (University of British Columbia), Rebecca Riley (UK Economic Statistics Centre of Excellence), Paul Schreyer (OECD), Kevin Fox (UNSW), Jan de Haan (Statistics Netherlands), Jonathan Hambur (Australian Treasury), Gabriela Araujo (Reserve Bank of Australia), Shipei Zeng (UNSW), Nalini Agarwal, (UNSW), Robert Tiong, (UNSW), Anthony Brassil (Reserve Bank of Australia), Shengyu Li (UNSW), Andrew Glassock (Australian Bureau of Statistics), Khanh Hoang (ANU and Australian Bureau of Statistics), Will Chancellor (ABARES), Paul Wyrwoll (ANU) and Carl Obst (Inst. for Development of Environmental-Economic Accounting).

8.2 Visitors

The following is a list of visitors hosted by CAER as part of its commitment to stimulate research activities and foster research students and early career academics:

Visitors hosted by the Economic Measurement Initiative of CAER

Rebecca Riley, UK Economic Statistics Centre of Excellence, visited UNSW in December 2019. Dr Paul Schreyer, OECD, visited UNSW in December 2019.

Visitors hosted by the Real Estate Initiative of CAER

Professor Jan de Haan, Statistics Netherlands, visited UNSW in December 2019.

8.3 Academic, industry and government engagements

Academic engagements

 Professor Ricard Holden participated as a panel member of UNSW Business School's experts who analysed the 2019 Federal Budget and its implications, "BusinessThink Federal Budget Roundtable 2019" on 4th April, at the Business Lounge, UNSW Business School.

Industry and Government engagements

- As part of its teaching program, the REI hosted Bryan Reid (Vice President, Research, MSCI), as a guest lecturer in Professor Kevin Fox's ECON4309/6309 Economic Measurement course in the second semester 2019. In his lecture Bryan discussed the methodologies employed by MSCI in producing real estate related regional and global indexes, benchmarks, performance modelling, data metrics and risk analytics.
- In 2019, CAER, in partnership with The Methodology Division of the Australian Bureau of Statistics, undertook research to develop experimental estimates of firm-level capital stock and to apply a method for the estimation of firm-level multifactor productivity (MFP) using integrated microdata from the Business Longitudinal Analysis Data Environment (BLADE).

8.4 Media engagement

The following is a list of media engagement undertaken by CAER members in order to raise the profile of CAER and UNSW in the broader community:

On-going

- Professor Richard Holden, weekly commentator on Peter van Onselen's, PVO NewsDay on SkyNews Australia.
- Professor Richard Holden, monthly op-ed writer for the Australian Financial Review.
- Professor Richard Holden, weekly columnist for the Conversation. The weekly column called "Vital Signs" aims to contextualise weekly economic events and cut through the noise of the data impacting global economies.
- Professor Richard Holden is a regular commentator on ABC radio and television, and on 10News.

January 2019

Professor Richard Holden wrote an article on "Prepare to say goodbye to the cold, hard cash in your pocket," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs: so far, it's more of a house price blip than a bust in the making," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: the power of not being too clear," The Conversation.

Professor Richard Holden wrote an article on "Squeezing the wealth more complicated than it looks," Australian Financial Review.

February 2019

Professor Richard Holden wrote an article on "Vital Signs. Yet another year of steady rates. What's the point of the RBA inflation target?" The Conversation.

Professor Richard Holden wrote an article on "Cashing in on carbon reduction," Inside Story.

Professor Richard Holden wrote an article on "Vital Signs. If needed, this man can and will cut rates during the election campaign," The Conversation.

Professor Richard Holden wrote an article on "'Staggering': Cash incentives improve kids' learning, research shows," SMH.

Professor Richard Holden wrote an article on "Why we should (carefully) consider paying kids to learn," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs. when watchdogs become pets – or the problem of 'regulatory capture'," The Conversation.

Professor Richard Holden wrote an article on "Biggest discipline on banks would be customers walking away," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs. why more expensive milk won't help farmers much," The Conversation.

Professor Richard Holden wrote an article on "Now is the time to plan how to fight the next recession," The Conversation 2/26/19.

Professor Richard Holden wrote an article on "Command and control no substitute for a carbon market," Australian Financial Review.

March 2019

Professor Richard Holden wrote an article on "Vital Signs. Do deficits matter anymore?" The Conversation.

Professor Richard Holden wrote an article on "It's members' money, not Combet's and big super's," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs: Australia's sudden ultra-low economic growth ought not to have come as surprise" The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: It's one thing to back down on Hayne's recommendation about mortgage brokers, it's another to offer nothing in its place" The Conversation.

Professor Richard Holden wrote an article on "Introducing shadow equity: a fresh idea to escape the low wage trap," The Conversation.

April 2019

Professor Richard Holden wrote an article on "Frydenberg's budget looks toward zero net debt, but should this be our aim?" The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: why governments get addicted to smoking, gambling and other vices," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: the 'ball-tampering' budget trick they don't want you to know about," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: Zero inflation means the Reserve Bank should cut rates as soon as it can, on Tuesday week," The Conversation.

Professor Richard Holden wrote an article on "Morrison and Shorten take aim at one another in leaders' debate: experts respond," The Conversation.

Professor Richard Holden wrote an article on "Claiming Credit for Climate Policy," Australian Financial Review

May 2019

Professor Richard Holden wrote an article on "Vital Signs: Policies come and policies go, but surely we shouldn't be subsidising inheritances," The Conversation.

Professor Richard Holden wrote an article on "Vale RBA inflation targeting regime," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs: When it came to the surplus, both Bill and Scott were having a lend," The Conversation.

Professor Richard Holden wrote an article on "Markets are great, except when they're not," Inside Story.

Professor Richard Holden wrote an article on "Hawke was our larrikin, but also our reformer," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: for the best election predictions, look to the betting markets, not the opinion polls," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: APRA is going to make it easier to borrow. It could be another one of its bad calls," The Conversation.

June 2019

Professor Richard Holden wrote an article on "RBA finally acts to stave off a self-inflicted recession," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs. If we fall into a recession (and we might) we'll have ourselves to blame," The Conversation.

Professor Richard Holden wrote an article on "APRA-cadabra: Why Australians will be able to get larger home loans," Finder X.

Professor Richard Holden wrote an article on "The RBA just backflipped on the job market," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs: the RBA's marching orders are no longer realistic. They'll have to change," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: Once were Kiwis. Here's the hidden history of Australia's own well-being framework," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: having a bob each way on US and China is Australia's own super-power," The Conversation.

July 2019

Professor Richard Holden wrote an article on "Vital Signs: Trump's nominations for the US Federal Reserve are an odd lot, and an even bet," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: we need those tax cuts now, all of them. The surplus can wait," The Conversation.

August 2019

Professor Richard Holden wrote an article on "Vital Signs: the battle for the soul of the US Democrats that's taking place before our eyes," The Conversation.

Professor Richard Holden wrote an article on "The misguided race to tax digital revenues," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs: Blame Trump, not China for the looming trade and currency war," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: Amid talk of recessions, our progress on wages and unemployment is almost non-existent," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs. Turning Germanese. Economically, we're on the road to becoming Germany rather than Greece," The Conversation.

Professor Richard Holden wrote an article on "Business tax cut is a better signal," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs. Business investment is flatlining, and it isn't clear that suasion or a special allowance will help," The Conversation.

September 2019

Professor Richard Holden wrote an article on "What we should do about the GDP numbers," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs. Sure, economic growth is low, but think about what's gone right," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: All this overinflated talk about an indexfund bubble is very passive-aggressive," The Conversation.

Professor Richard Holden wrote an article on "Why going green is the best way to fire up the economy," SMH.

Professor Richard Holden wrote an article on "Vital Signs: NBN's new price plans are too little, too late," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: Why can't Australia be friends with both US and China?," The Conversation.

October 2019

Professor Richard Holden wrote an article on "The RBA needs to disagree more openly," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs: yes, house prices will rise with lower interest rates, but that's not the only effect," The Conversation.

Professor Richard Holden wrote an article on "Nobel poverty fighters show science can improve the world," Australian Financial Review.

Professor Richard Holden wrote an article on "The best way forward on climate change: Toward a Carbon Tax and dividend." therift.eu.

Professor Richard Holden wrote an article on "Towards Universal Coverage? Reflections on The Promise and Pitfalls of a Public Option." Jotwell.

Professor Richard Holden wrote an article on "Vital signs. Our compulsory super system is broken. We ought to axe it, or completely reform it," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: talk of a US wealth tax is about symbolism as much as it is about economics," The Conversation.

November 2019

Professor Richard Holden wrote an article on "Vital Signs: does monetary policy work anymore?" The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: Might straight down the middle be the source of our economic success?" The Conversation.

Professor Richard Holden wrote an article on "How 'hurt money' could fix the exec pay problem," Australian Financial Review.

Professor Richard Holden wrote an article on "Vital Signs. Untaxing childcare is a bold idea that seems unfair, but might benefit us all," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: let's not weep for Westpac's board, but directors do need help," The Conversation.

December 2019

Professor Richard Holden wrote an article on "Vital Signs: Australia's slipping student scores will lead to greater income inequality," The Conversation.

Professor Richard Holden wrote an article on "Vital Signs: Australia's wafer-thin surplus rests on a mine disaster in Brazil," The Conversation.

Professor Richard Holden wrote an article on "'Back to basics' is not our education cure - it's where we've gone wrong," SMH.

Professor Richard Holden wrote an article on "Vital Signs: Australia's nation-building opportunity held hostage by the deficit daleks," The Conversation.

9. Details of research supervision and teaching activities carried out by CAER members on behalf of academic units

9.1 Research supervision

Postgraduate research supervision activities within CAER are coordinated with the relevant Schools/Faculties (mainly the School of Economics and UNSW Business School), in accordance with the relevant UNSW policies, procedures and delegations. The following is a list of research supervision carried out by CAER members in 2019 as part of their initiative activities. CAER members are marked in bold.

Honours Supervision

Supervisor: Professor Kevin Fox

Nalini Agarwal

School of Economics, UNSW, 2019

Supervisor: Professor Kevin Fox

Robert Tiona

School of Economics, UNSW, 2019

Supervisor: Richard Holden

Jonathan Nathan (Honours Class I) 2019

Supervisor: Richard Holden

Daniel Thornton (Honours Class I) 2019

Supervisor: Rosalind Dixon

Christopher Burnitt

UNSW Law School, UNSW 2019

PhD Supervision

Supervisor: **Professor Kevin Fox**

Adam Gorajek: Crossing Econometrics and Measurement

In progress

Supervisor: Professor Kevin Fox

Shipei Zeng: Topics in Measurement Economics

In progress

Supervisor: Kevin Fox

Miguel Lorca: Retirement savings adequacy: A cross-country analysis of pensions

In progress

Supervisor: Professor Kevin Fox

Khanh Hoang: Accounting for Natural Capital in Productivity Analysis

In progress

Supervisor: Richard Holden

Barton Lee

School of Economics, UNSW, 2017-2019 (ongoing).

Supervisor: Richard Holden

Ningyi Sun

School of Economics, UNSW, 2019- (ongoing).

Supervisor: Professor Rosalind Dixon

Shreeya Smith
UNSW Law School.

Supervisor: Professor Rosalind Dixon

Jemima Roberts UNSW Law School

Supervisor: Professor Rosalind Dixon

Khanh Hoang UNSW Law School

Supervisor: Professor Rosalind Dixon

Elizabeth Perham UNSW Law School

9.2 Teaching activities

Real Estate Initiative

Fifty-two students have completed the real estate studies major, which is a great achievement
for the Real Estate Initiative since the establishment of the major in 2014. The real estate major
continued to see an increase in students' enrolments. In 2019, and nineteen students chose
the real estate major as their specialized major.

Dr Nigel Stapledon, member of the Real Estate Initiative taught the "Real Estate Economics and Public Policy" course which was delivered to both undergraduate and postgraduate students in the second semester of 2019. The delivery of the two courses was coordinated with the UNSW Business School in accordance with the relevant UNSW policies and procedures.

With support from the Real Estate Initiative and the UNSW Business School, the UNSW Real Estate Student Society (Real Soc) continued to be very active in 2019. In particular, the UNSW Real Estate Student Society organised career's panel event chaired by **Professor Kevin Fox** on the 2nd of April 2019 at UNSW main Campus, Roundhouse Room 6.

The panel included: **Rodney Timm** Director, Property Beyond and CoreNet Global | Australian Chapter **Jane Combes**, Head of Talent Acquisition, Pacific at CBRE, **Edward Chi-Zhang** Consultant, Real Estate Advisory at PwC Australia and **Angela Wang** Founder of Surplus Home Realty and Sales Manager of APEX Investment Alliance.

Economic Measurement Initiative

Professor Kevin Fox delivered a course on Economic Measurement.

Law and Economics Initiative

• Professor Rosalind Dixon delivered a course on Economic analysis of the Law.

10. Details of significant managerial or personnel changes during 2019

- Professor Richard Holden continued as Deputy Director of CAER.
- Dr Stapledon continued his association with CAER on a voluntary basis and the Director is in the process of officially appointing him as a visiting Real Estate Research Fellow within CAER (a non-remunerated position).

11. A record of dates and attendance at meetings of CAER's Steering Committee

Date	Attendance	Absent
29/08/19	Professor Kevin Fox, Professor Richard Holden, Ms Maree Magafas, Professor Jerry Parwada, Professor Tim Harcourt and Kala Miranda (minutes).	Professor Richard Dunford (Acting, Chair and ADR)