

Annual Report for The Centre for Efficiency and Productivity Analysis (CEPA)

For the year ended 31 December 2017

Annual Report for CEPA
(Centre for Efficiency and Productivity Analysis)
For the Year ended 31 December 2017

1) Agreed objectives for the 2017 calendar year and how these objectives were achieved or progressed.

The main purpose of the Centre is to provide a focal point for research, consultancy and training in efficiency and productivity analysis in Australia and the Asia/Pacific Region, and thus advance and promote the research in the field of efficiency and productivity. The revenues obtained through such activities are then typically used to fund the public good type activities for the local productivity and efficiency research community, through (co-) funding visits of external top scholars to visit CEPA, organizing and (co-)funding workshops and conferences, etc.

The principal aims and objectives of the Centre are to undertake theoretical and applied research, develop useful end-user-driven intensive courses and workshops and to develop computer software for use by private and public sector organizations. Specific goals are:

- to assess and develop methods for the measurement of productivity, efficiency and economic performance;
- to apply these methods to assess the performance of firms, industries and sectors within the domestic and international economies;
- to conduct research directed towards explaining and interpreting patterns of productivity and economic growth across nations;
- to conduct ex post assessments of the effects of microeconomic reform and deregulation on productivity and efficiency;
- to provide technical advice to private and public sector organizations on efficiency and productivity measurement; and
- to offer short courses and workshops to researchers, managers and policy analysts from various sectors of industry and government.

Agreed objectives for 2017:

- Continue to produce high quality journal publications.
- Continue to provide high quality supervision to our PhD students and encourage them to produce journal publications from their research.
- Continue to attract high profile visitors and good quality PhD students to work on projects undertaken by CEPA staff.
- Continue to seek external research funding through consultancies and grants.
- Run the CEPA International Workshop
- Deliver at least two short-courses on introductory and/or advanced productivity and efficiency analysis methods.

The Centre has very successfully reached its 2017 objectives, as is summarized below. In a nutshell, it might be also worth noting that due to the work of scholars united by the Centre, RePEc continues to rank the School of Economics of UQ in the top-3 (although reduced from top 2) in the world in the field of Efficiency & Productivity—above Harvard, Stanford, Yale, etc. (These ranking facts are as of January 2018, see: <https://ideas.repec.org/top/top.eff.html>). **Yet, investment into capacity building of CEPA (due to retirement of some of its key members) is urgently needed to maintain this standing.**

2) Outputs (including publications, workshops, industry events)

From Valentin Zelenyuk (Director of CEPA, A/Professor UQ)

Journal Articles:

“Central Limit Theorems for Aggregate Efficiency” with Leopold Simar, *forthcoming at Operations Research* (2018, *accepted* May 2017).

“Data envelopment analysis, truncated regression and double-bootstrap for panel data with application to Chinese banking,” with Kai Du, Andrew C. Worthington, *European Journal of Operational Research* 265:2, 2018, pp. 748-764, [Ihttps://doi.org/10.1016/j.ejor.2017.08.005](https://doi.org/10.1016/j.ejor.2017.08.005).

“Measuring efficiency of Vietnam commercial banks in the presence of bad outputs: An application of slack-based directional distance function,” with Duc Manh Pham (2017) *Empirical Economics*, *forthcoming* doi: [10.1007/s00181-017-1232-7](https://doi.org/10.1007/s00181-017-1232-7).

“[Nonparametric Least Squares Methods for Stochastic Frontier Models](#),” (2017) with Leopold Simar and Ingrid Van Keilegom, *forthcoming in Journal of Productivity Analysis* (doi:10.1007/s11123-016-0474-2)

“Introduction to the APPC2014 special issue,” with Antonio Peyrache (2017), *Journal of Productivity Analysis*, 47 3: 185-187. doi:10.1007/s11123-017-0506-6

Book Chapters:

“Stochastic Frontier Analysis: Foundations and Advances” with Subal Kumbhakar and Chris Parmeter, In *Handbook of Production Economics*, Eds., Ray, Chambers and Kumbhakar, Springer, *forthcoming*.

"Aggregation of Individual Efficiency Measures and Productivity Indices." With Andreas Mayer In *Handbook of Economic Performance Analysis*, Eds. William H. Greene and Thijs ten Raa, Palgrave Macmillan, London, *forthcoming*.

Organization and delivery of Intensive Course:

CEPA Intensive Course on Performance Analysis: Theory & Practice, by Associate Professor Zelenyuk (Australia): 19-21 July 2017 (by V. Zelenyuk)

Conference and Invited Presentations:

“Central Limit Theorems for Aggregate Efficiency” with Leopold Simar, presented at European Workshop on Efficiency and Productivity Analysis (EWEPA), June 2017, London, UK.

Invited Speaker at DEA International Conference, University of Hefei, China, 7-10 July 2017 “Central Limit Theorems for Aggregate Efficiency”.

Invited Seminar at the University of Adelaide: “Central Limit Theorems for Aggregate Efficiency” based on work with Leopold Simar. 28 April 2017.

Invited Seminar at the Australian National University: “Central Limit Theorems for Aggregate Efficiency” based on work with Leopold Simar. 28 March 2017.

Organization of Workshop

Annual CEPA International Workshop: 2-3 Nov 2017

Appointments:

- Director and Member of the CEPA Advisory Committee.
- Associate Editor for Journal of Productivity Analysis (A by ABDC)
- Editorial Board member for the DEA Journal (new, and unranked by ABDC)
- Guest Co-Editor for Special issue on Asia Pacific Region in Journal of Productivity Analysis (A by ABDC),

Referee reports for academic journals, including Journal of Econometrics, Operations Research, European Journal of Operations Research, etc.

Supervision of two PhD and 1 MA students (related to CEPA):

Kelly Trinh (4th year)

Manh Duc Pham (2nd year)

Bao Hoang Nguyen (1st year).

Engagement with Government and Industry:

Consulting project for the Netherlands Authority for Consumers and Markets (Netherlands), via Economic Insights: Topics in efficiency benchmarking of energy networks: Choosing the model and explaining the results

Consulting project for the Netherlands Authority for Consumers and Markets (Netherlands), via Economic Insights: Topics in efficiency benchmarking of energy networks: Selecting cost drivers

From Chris O'Donnell (Professor, UQ)

Journal Articles:

O'Donnell, C.J., Fallah-Fini, S. and K. Triantis (2017). Measuring and Analysing Productivity Change in a Metafrontier Framework. Journal of Productivity Analysis DOI: 10.1007/s11123-017-0494-6.

Amsler, C., O'Donnell, C.J. and P. Schmidt (2017). Stochastic Metafrontiers. Econometric Reviews DOI: 10.1080/07474938.2017.1308345.

Working papers:

O'Donnell, C. J. (2017) Estimating total factor productivity change when no price or value-share data are available. Centre for Efficiency and Productivity Analysis Working Papers WP01/2017. University of Queensland.

<http://www.uq.edu.au/economics/cepa/docs/WP/WP012017.pdf>.

Conference and Workshop Presentations:

O'Donnell, C.J. (2017). Measuring Total Factor Productivity Change When No Price or Value-Share Data are Available. Keynote paper presented at the Data Envelopment Analysis International Conference, Hefei, China, 9 July.

O'Donnell, C.J. (2017). Productivity Analysis in the Presence Uncertainty. Keynote paper presented at the 15th European Workshop on Efficiency and Productivity Analysis, London, 12-15 June.

O'Donnell, C.J. and T. Puolokainen (2017). Efficiency Analysis in the Presence of Demand Uncertainty. Keynote paper presented at the 6th Workshop on Efficiency and Productivity Analysis, Porto, Portugal, 9 June.

O'Donnell, C.J. (2017) An Historical Overview of the Evolution of Productivity Analysis. Presented at the PreConference on Sustainability, Productivity and Public Policies: Synergies to Improve Agricultural Economic Development University of Talca, Chile, 16 October, 2017

O'Donnell, C.J. (2017) Climatic Effects and Agricultural Productivity Analysis. Keynote paper presented at the IAAE Inter-Conference Symposium on Agricultural Productivity, Climate Change and Sustainable Resource Management University of Talca, Chile, 17-20 October, 2017 □

Seminars:

Productivity Analysis in the Presence of Environmental Uncertainty. Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, 9 May, 2017

Efficiency Analysis in the Presence of Demand Uncertainty. School of Business and Economics, Loughborough University, □21 June, 2017

Efficiency Analysis in the Presence of Demand Uncertainty. Xi'an Jiaotong-Liverpool University, Suzhou, China, □5 July, 2017

Productivity Change in Agriculture: A Comparative Analysis, Ministerio de Agricultura Santiago, Chile, □23 October, 2017

Efficiency Analysis in the Presence of Demand Uncertainty. 2017 CEPA International Workshop on Performance Analysis: Theory and Practice University of Queensland, Brisbane, □2-3 November, 2017

Consultancies:

O'Donnell, C.J. and A. Peyrache (2017) Productivity Change in Agriculture: A Comparative Analysis, Asian Productivity Organisation (Ref. No. 12-AG-31-GE-RES-B), USD 47500.

Research Students:

Tarmo Puolokainen (PhD, Tartu University)

Zi Yin (Honours)

Significant External Service:

Co-Editor, Journal of Productivity Analysis

Associate Editor, Empirical Economics

Visitors:

Alan Ker, University of Guelph, 1/3/17 to 30/4/17

Zelei Xiao, Central China Normal University, 24/7/17 to 30/6/18

David Saal, Loughborough University, 30/10/17 to 13/11/17

Barnabe Walheer, Xi'an Jiaotong-Liverpool University, China, 1/11/17 to 4/11/17

From Prasada D.S. Rao (Professor, UQ)

Journal Articles:

Maitra, C. and D.S. Prasada Rao (2017), “An Empirical Investigation into Measurement and Determinants of Food Security”, *Journal of Development Studies*, <http://dx.doi.org/10.1080/00220388.2017.1324144>.

Rohde, N., K.K. Tang, L. Osberg, and D.S. Prasada Rao (2017), “Is it Vulnerability or Economic Insecurity That Matters for Health”, *Journal of Economic Behavior & Organization*, 134, 307-319.

Carrington, R., C.J. O’Donnell and D.S. Prasada Rao (2017), “Australian University Productivity Growth and public funding revisited” to appear in *Studies in Higher Education*, <http://dx.doi.org/10.1080/03075079.2016.1259306>

Inklaar, R. and D.S. Prasada Rao (2017), “Cross-country Income Levels Over Time: Did the Developing World Suddenly Become Much Richer?”, *American Economic Journal (Macroeconomics)*, Vol. 9, No. 1, January, 2017, pp. 265-90.

Biggeri, L., and D.S. Prasada Rao (2017), “Income, Poverty and Prices: Comparisons at National and Sub-national Level: Editors’ Introduction”, *Social Indicator Research*, Vol. 131, No.1, pp 1-6.

Ganegodage, K. R., Alicia Rambaldi, D.S. Prasada Rao and K.K. Tang (2017), “A New Multidimensional Measure of Development: the Role of Technology and Institutions”, *Social Indicator Research*, Vol. 131, No. 1, 65-92.

Wu, D. and D.S. Prasada Rao (2017), “Urbanization and Income Inequality in China: An Empirical Investigation at Provincial Level”, *Social Indicator Research*, Vol. 131, No. 1, 189-214.

Appointments:

- Visiting Professor, Institute for Economic Research, Hototsubashi University, March-May, 2017
- Member of the Technical Advisory Group for the International Comparison Program (ICP), World Bank, 2017-19
- Member, Taskforce on PPP Compilation and Computation for the ICP, World Bank, 2017-2019
- Member, Taskforce on Country Operational Guidelines and Procedures for the ICP, World Bank, 2017-19.

Major Consulting Research Reports – 2017

- Rao, D.S. Prasada, K.K. Tang and Peyman Khezari (2017), *Stage I Report on QTC – UQ Use of the public hospital system by private patients: motivations and implications*, Queensland Treasury Corporation, 30 June, 2017.
- Inklaar, R. and D.S. Prasada Rao (2017), *Extrapolation of PPPs and Real Expenditures for years in between benchmark years, 2012-214*, Report prepared for DECDG, World Bank

From Knox Lovell (Honorary Professor, UQ/CEPA)

Journal Articles:

“A New Composite Index for Greenhouse Gases: Climate Science Meets Social Science,” *Resources* 6 (2017), 62 doi:10.3390/resources6040062 (with H. K. Edmonds and J. E. Lovell)

“What Determines Students’ Expectations and Preferences in University Teaching and Learning? An Instrumental Variables Approach,” *Economic Analysis and Policy* 56 (2017),18-27 (with M. Alauddin, A. Ashman and S. Nghiem)

Book chapter:

“Assessing Stream Health with Respect to Ecological Connectivity,” Chapter 5 in T. Ancev, M. A. S. Azad and F. Hernandez, eds., *New Directions in Productivity Measurement and Efficiency Analysis: Counting the Environment and Natural Resources*. Cheltenham, UK: Edward Elgar (with H. K. Edmonds and J. E. Lovell)

Seminar:

“A New Composite Index for Greenhouse Gases: Climate Science Meets Social Science,” School of Economic and Social Development, Nankai University, Tianjin, China

Appointments:

I have been appointed as Adjunct Professor in the College of Economic and Social Development, Nankai University, Tianjin, China

I serve on the International Organizing Committee of the 12th Asia Pacific Productivity Conference, to be held at Seoul National University, Seoul, Korea, July 4-6, 2018

From Antonio Peyrache (Senior Lecturer, UQ)

Journal Articles:

Peyrache A., Zelenyuk V. (2017), “Introduction to the APPC2014 special issue”, *Journal of Productivity Analysis*, DOI 10.1007/s11123-017-0506-6

Peyrache A., Zhu M. (2017), “The quality and efficiency of public service delivery in the UK and China”, *Regional Studies*, 51, 285-296

Peyrache A., Rambaldi A. (2017), “Incorporating temporal and country heterogeneity in growth accounting – an application to EU-KLEMS”, *Journal of Productivity Analysis*, 47, 143-166

Filippetti A., Peyrache A. (2017), “Productivity growth and catching up: a technology gap explanation”, *International Review of Applied Economics*, 31, 283-303

From Alicia Rambaldi (Associate Professor, UQ)

Journal Articles:

Plant, L., A. N. Rambaldi, N. Sipe (2017), "Evaluating Revealed Preferences for Street Tree Cover Targets: A Business Case for Collaborative Investment in Leafier Streetscapes in Brisbane, Australia." *Ecological Economics*, 134, 238–249. <http://dx.doi.org/10.1016/j.ecolecon.2016.12.026>.

Peyrache, A. and A.N. Rambaldi (2017), "Incorporating Temporal and Country Heterogeneity in Growth Accounting - An Application to EU-KLEMS" *Journal of Productivity Analysis*, 47, 2, 143–166. <https://doi.org/10.1007/s11123-017-0498-2>

Heard, C., F. M. Menezes, A. N. Rambaldi (2017), "The dynamics of bank location decisions in Australia," *Australian Journal of Management*, <https://doi.org/10.1177/0312896217717572>. First published September 6, 2017.

Appointments:

2017 - Methodology Advisory Committee - Australian Bureau of Statistics

Since Sept 2015 - Editorial Board the *Review of Income and Wealth*

3) Research grants, consultancies and other contracts that were awarded.

From Valentin Zelenyuk (Director of CEPA, A/Professor UQ)

ARC Future Fellowship 2017 (nominated by BEL & DVCR, applied in 2016, awarded in 2017)

ARC Future Fellowship, Title: “Improving Productivity: Theory and Application to Australian Hospitals” Nov. 2017- Nov. 2021. (\$944,000)

From Prasada D.S. Rao (Professor, UQ)

ARC Discovery Project - \$270,000, “**How reliable are Purchasing Power Parities from the World Bank?**” (jointly with Alicia Rambaldi and Gholamreza Hajargasht), 2017-2019.

ARC Discovery Project - \$240,500, “**Inequality of opportunity in Australia**”, (jointly with KK Tang, Nicholas Rohde, Pravin Trivedi and Lars Osberg), 2017-2019.

From Alicia Rambaldi (Associate Professor, UQ)

Predicting the Value and Use of Urban Land (July 2017- July 2020). Funding: Australian Research Council (ARC) Linkage Grant. Investigators: A N. Rambaldi, Madeleine Tan. Partner Organisation: Department of Treasury and Finance Victoria

How reliable are Purchasing Power Parities from the World Bank? (2017-2019) Chief Investigators: DS Prasada Rao, A.N Rambaldi, Gholamreza Hajargasht (Swinburne University) Funding: Australian Research Council (ARC) Discovery Project (\$270,000)

From Chris O'Donnell (Professor, UQ)

O'Donnell, C.J. and A. Peyrache (2017) Productivity Change in Agriculture: A Comparative Analysis, Asian Productivity Organisation (Ref. No. 12-AG-31-GE-RES-B), USD 47500.

4) Other relevant information

Overall CEPA continued to be a leading global centre for research and development of theories and methods for economic performance measurement and for designing innovative and advanced statistical and econometric tools for analysis of large scale firm-level data.

Strong engagement of the Centre with industries and government in Australia and Worldwide had a profound influence on decision making in different sectors, with aims to help boosting productivity gains in the Australian and World economy.

To maintain the impressive strength in its area of expertise and to continue delivering the great results—in terms of publications, research and industry engagements—CEPA needs strategic support from BEL Faculty and UQ central (VC and DVCR).

Indeed, a key senior and legendary member of CEPA, Professor Prasada Rao is retiring as of July 2018. Another key senior and legendary member of CEPA, Honorary Professor Knox Lovell also announced his natural slowing down due to age. Moreover, the other members of CEPA have been headhunted by various local and international universities to move and establish a similar centre at their institutions. This is a moment of truth for UQ:

“To be or not to be among the leaders in this important field of research?!”

For the sake of sustainability, it is vital to bring in several new scholars to CEPA. Specifically, we ask for at least one postdoctoral (or research fellows) position and one new professorial position (to replace Professor Rao) to be allocated from strategic funds to maintain the strength of UQ in the area of productivity and efficiency analysis. While filling these new positions, especially the professorial position, we will aim to bring scholars that are very strong in econometrics and this will likely increase UQ’s standing in econometrics to level 5 in the ERA.

The return on such a strategic fund investment from UQ will prove to be very fruitful and is very likely to be well above the average of returns from similar investments to other centres and institutes in Australia in general. This confidence is based on the facts: CEPA has generated more research funds than any other field in the School of Economics: e.g. CEPA’s core members have generated about quarter of all research grants in the last 10 years and in some years it was over 50%! Most of these grants are the most prestigious grants—from the ARC, including ARC Professorial Fellow, two ARC Future Fellowships, many ARC DPs and ARC Linkage Projects.

On the other hand, absence of such strategic investments into CEPA will intensify the depreciation of UQ’s strength in this area and, very likely, lead to completely losing any serious advantage in this field. That is why, before it is too late, it is very important to revert the trend (the current ranking fell from top 2 to top 3 in the world and is likely to decrease if no investments into capacity are made).

Anticipating this, the CEPA team have made substantial efforts to raise funds from the ARC Centre of Excellence 2020. A very strong internal EOI for the Centre of Excellence “Centre for Economic and Business Performance Analysis” was prepared by Prof. Prasada Rao (proposed as CI and Director) and ARC Future Fellow Valentin Zelenyuk (proposed CI and Deputy-Director) and with contributions from many other renowned international scholars. The idea was to

embrace several key focal points of research in the world (including scholars from Harvard, NYU, etc.) and in Australia (UNSW, University of Melbourne, etc.) around CEPA. For some reasons, the application was not successful (detained feedback was requested, yet so far not received.) We aim to apply for the round in 2023 and seed funds are needed to maintain the strength of CEPA until then.

5) Agreed objectives for the 2018 calendar year.

Agreed objectives for 2018 are similar to those that were in 2017, namely:

- Continue to produce high quality journal publications.
- Continue to provide high quality supervision to our PhD students and encourage them to produce journal publications from their research.
- Continue to attract high profile visitors and good quality PhD students to work on projects undertaken by CEPA staff.
- Continue to seek external research funding through consultancies and grants.
- Deliver one or more intensive short-courses on productivity and efficiency analysis methods.
- Run one or more 2-3 day workshops with focus on productivity and efficiency analysis.



Valentin Zelenyuk
Centre Director

Date 10/3/2018



Professor Phil Bodman
Head of School (Acting)

Date 20.3.2018