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State Sector Productivity Enquiry

New Zealand Productivity Commission

PO Box 8036

The Terrace

WELLINGTON 6143

Dear Sir or Madam

Please find attached our comments on the NZ Productivity Commission's Draft Report on Measuring and improving state sector productivity.

At the University of Auckland Business School, there are a number of us who have researched, taught and written about productivity for many years. We will shortly be establishing a Centre for Productivity Studies within the Business School. We welcome the opportunity to provide the comments below on the draft report.

Kind regards

Paul Rouse	Dimitri Margaritis	Maryam Hasannaasab
Professor	Professor	Post-Doctoral Research Fellow

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Comments: Measuring and improving state sector productivity (Draft Report), NZ Productivity Commission December 2017.

Our general view is that this is a well-written document that provides an excellent discussion around productivity in a New Zealand (NZ) context. As such it should serve as a valuable foundation for building on efficiency and productivity research and applications in the public sector. We have tried to provide some helpful observations and suggestions which are set out below.

1. It is good to see a focus on productivity, especially measurement. The Public Finance Act 1989 requirements around reporting distinctions between outcomes, outputs and inputs was a giant leap in better accountability for public sector organisations. At the time, there was considerable confusion around the distinction between outputs and outcomes and the distinctive roles of ministers and departments (Ball, 1992)[i]. However, as Figure 1.1 shows, these distinctions enable measures of the 3 E's (efficiency, effectiveness and economy) to be estimated as used in Rouse and Chiu (2009)[ii] to determine optimal life cycle maintenance in road maintenance for Transit NZ. Although these measures are still required to be reported, it is not clear how they are currently used which may be an indication of being too broad or overly financial. We agree with the statement made on page 3 about "the culprits for this lack of measurement and understanding are cultural and institutional."
2. While productivity leads to greater efficiency as stated in the 'Overview' the normal causal link is from efficiency to productivity as articulated in the seminal paper on efficiency and productivity by Caves at al. (1982) and its extension by Färe et al. (1994). [See Färe et al. (2008, 2011) for more details][iii]
3. We note the distinction drawn between goods and services on page 9 but suggest that it might be helpful to look at the literature around service dominant logic[iv] which aligns very well with the production perspective described on page 9.
4. Page 9 also refers to limited or lack of price information for many services in the public sector. New models in production modelling use shadow prices to estimate virtual prices for non-marketed goods and services that potentially can be used in these situations as described in our recent research.[v]
5. We agree with the implication noted on page 16 that "effectiveness is prioritised over efficiency, rather than pursuing both goals." Causal observation of a sector such as health readily shows the tension between efficiency and effectiveness (almost manager versus clinician) and the need for balance. We support more research to be focused on this tension and ways in which a balance can be attained to satisfy competing stakeholders.
6. Page 36 provides some illustrative outputs and outcomes in various sectors. We are aware in health that while there are well developed output measures for case weighted inpatients (and to a lesser extent outpatient attendances), there are less well developed measures of other non-inpatient activities such as community health and mental health. We have done some work on developing measures in these areas particularly in home care and district nursing[vi].
7. The report makes no mention of the Integrated Data Infrastructure (IDI) maintained by Statistics NZ which might be a useful extension or resource for productivity modelling.

8. Page 38 mentions the issues around controllability principles and provides a useful figure (3.1) illustrating hierarchical levels of analysis. We are familiar with aggregation issues especially those using index numbers as well as some hierarchical models[vii]. We also suggest looking at recent research into network models especially in light of the discussion around intermediate goods and services and outputs and outcomes.
9. Chapter 5 provides a good discussion around environmental and contextual variables and we have a strong interest in this area having published in areas such as education[viii] as well as technical aspects of modelling these variables[ix].
10. The Report does not talk much about inter-temporal productivity measurement and network models which can bring into the analyses the dynamics of technological change[x] and time substitution modelling[xi]. These can be especially powerful methods when estimating the effects of climate change and abatement activities on productivity.

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[i] Ball, I. (1992). "Outcome Specification." *Proceedings of the New Zealand Society of Accountants Public Sector Convention*.

[ii] Rouse, P. and T. Chiu. 'Towards Optimal Life Cycle Management in a Road Maintenance Setting using DEA.' *European Journal of Operational Research* 196: 672-681, 2009.

[iii] Caves,D., Christensen, L. and Diewert, W.D. 1982, The economic theory of index numbers and the measurement of input, output and productivity, *Econometrica* 50(6), 1393-1414; Färe, R., Grosskopf, S., Norris, M., Zhang, Z. 1994, Decomposition of Productivity Growth in Industrialized Countries into Technical Change and Change in Performance, *American Economic Review* 84(1), 66-83; Färe, R., Grosskopf, S., Margaritis, D. (2008). Efficiency and Productivity: Malmquist and More. In: Fried, H.O., Lovell, C.A.K., & Schmidt, S.S. (Eds.), *The Measurement of Productive Efficiency and Productivity Growth*, 522-622, New York, Oxford University Press; Färe, R., Grosskopf, S., Margaritis, D. (2011). Malmquist Productivity Indexes and DEA. In: Cooper, W., Seiford, L., & Zhu, J. (Eds.), *Handbook on Data Envelopment Analysis*, (3rd ed.), 127-149, Springer, New York]

[iv] Vargo, S.L., Lusch, R.F., 2004. Evolving to a new dominant logic for marketing. *Journal of Marketing* 68, 1-17; Vargo, S.L., Lusch, R.F., 2008. Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science* 36, 1-10; Vargo, S.L., Lusch, R.F., 2016. Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science* 44, 5-23

[v] Fare, R., Grosskopf, S. and Margaritis, D**.** Pricing Non-marketed Goods Using Distance Functions. World Scientific - Now Publishers Series in Business, forthcoming; Färe, R., Grosskopf, S., Margaritis, D. (2018) "Shadow pricing" In Ray, S., Chambers, R., Kumbhakar, S. (Eds.), *Handbook of Production Economics*, Springer, forthcoming; Hasannasab, M., Margaritis, D**.** and Staikouras, C. "The financial crisis and the shadow price of bank capital." *Annals of Operations Research*, forthcoming.

[vi] Parsons, M., Rouse, P., Sajtos, L., Harrison, J., Parsons, J. and L. Gestro. (2017). Developing and utilising a new funding model for home care services in New Zealand. *Health & Social Care in the Community*

[vii] Cook, W., Chai, D., Doyle, J. and R. Greeen. (1998). Hierarchies and Groups in DEA. *Journal of Productivity Analysis* 10(2): 177-198

[viii] Harrison, J., & Rouse, A. P. (2014). Competition and public high school performance. *Socio-Economic Planning Sciences*, 48(1): 10-19.

[ix] Harrison, J., Rouse, P and J Armstrong. (2012). 'Categorical and Continuous Non-discretionary Variables in Data Envelopment Analysis: A Comparison of Two Single-stage Models.' *Journal of Productivity Analysis* 37

(3): 261-276; Roshdi I, Hasannasab M, Margaritis, Rouse AP. (2017). Generalised Weak Disposability and Efficiency Measurement in Environmental Technologies *European Journal of Operational Research*.

[x] Fare, R., Grosskopf, S., Fukuyama, H. and D. Margaritis. (2010). 'DEA and endogenous technological change', European Journal of Operational Research, 210: 457-458.

[xi] Fare, R., Grosskopf, S. and D. Margaritis. (2010). 'Time Substitution with Application to Data Envelopment Analysis', *European Journal of Operational Research*, 206, 686-690.