

Shipei Zeng

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Education

Ph.D. Economics, UNSW Sydney, Australia June, 2021 (*expected*)
Thesis Title: *"Productivity decomposition, price imputation and firm dynamics"*
Supervisors: Prof. Kevin Fox and Prof. Erwin Diewert

M.A. Economics, Renmin University of China, China June, 2017
Thesis Title: *"Designing the increasing block tariff for residents: the study of elasticity estimation and application based on micro household-level data"*
Supervisor: Prof. Zhanming Chen

B.A. Economics, Renmin University of China, China June, 2015
Thesis Title: *"Impact of fossil fuel subsidy reform on residents across income groups in China"*
Supervisor: Prof. Zhanming Chen

Fields of Interest

Economic Measurement, Data Mining, Energy Economics

Research Experience

Centre for Applied Economic Research, UNSW Business School
Research Assistant (Programming) July, 2019 – Dec., 2019
- Translated the R code of firm dynamics into Stata commands for the OECD
- Programmed bilateral and multilateral price indexes with data simulation
- Visualised price outputs in a grid for different elasticity scenarios

Teaching Experience

UNSW Sydney, Australia
ECON5257 Introductory Statistics and Data Analysis (Tutor) Semester 3, 2019

Professional Activities

Conferences

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| IARIW General Conference, Oslo, Norway (postponed) | Aug., 2020 |
| EMG Workshop, Sydney, Australia | Dec., 2019 |
| Society for Economic Measurement Conference, Frankfurt, Germany | Aug., 2019 |
| Productivity Research Network Fourth Conference, Sydney, Australia | May, 2019 |
| EMG Workshop, Sydney, Australia | Nov., 2018 |
| Forum of Chinese Energy and Environmental Economists, Xiamen, China | May, 2017 |
| Systems of Engineering Society of China Annual Conference, Beijing, China | Oct., 2016 |
| Youth Conference on Energy and Environment, Beijing, China | June, 2015 |
| Industrial Economics and Industrial Security Conference, Beijing, China | July, 2014 |

Refereeing

Journal of Reviews on Global Economics, AIMS Energy, Sustainability

Honours

Scholarships

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| Tuition Fee Scholarship plus a Research Stipend, UNSW Sydney | July, 2017 |
| CNPC Scholarship (Top 1%), Renmin University of China | Dec., 2014 |
| First Grade Scholarship (Top 5%), Renmin University of China | Dec., 2013 |

Awards

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| Digital Sichuan Data Mining Competition Top 5 Team, Sichuan Big Data Centre | Sept., 2020 |
| Beijing Distinct Graduate, Beijing Municipal Education Commission | June, 2015 |
| Summer Research Award, Renmin University of China | Nov., 2012 |

Grants

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| Financial Assistance Grant for 2020 IARIW General Conference | Mar., 2020 |
| Postgraduate Research Student Support Scheme, UNSW Sydney (\$2600) | May, 2019 |
| PRSS Conference Travel Top-up, UNSW Business School (\$750) | May, 2019 |
| Innovation Experiment Project Grant, Renmin University of China (\$2000) | Apr., 2013 |

Skills

Languages: English (fluent), Mandarin (native), Cantonese (intermediate)
 Coding: R, Python, Stata, SQL; authored an R package "dfvad"

Publications

1. Zhanming Chen, Shipei Zeng, Leo Lester, Linting Zhang, Xiaohua Xia, Shiyun Xu, Ahmed Alsaedi, and Tasawar Hayat. 2018. "Economic cost of China's oil import: welfare estimation for 2001–2015". *Resources, Conservation and Recycling*, 132: 158–167.
2. Shipei Zeng, Zhanming Chen, Ahmed Alsaedi, and Tasawar Hayat. 2018. "Price elasticity, block tariffs, and equity of natural gas demand in China: investigation based on household-level survey data". *Journal of Cleaner Production*, 179: 441–449.
3. Shipei Zeng, and Zhanming Chen. 2016. "Impact of fossil fuel subsidy reform in China: estimations of household welfare effects based on 2007–2012 data." *Economic and Political Studies*, 4(3): 299–318.

Working Papers

1. "Frontier firms, inefficiency and productivity dynamics" (Job Market Paper)

Productivity dynamics occur when firms enter and exit a market. Contributions from firms to industry productivity can be decomposed into effects from entrants, exits and incumbents. As opposed to productivity dynamics, productivity can also be decomposed into explanatory factors regarding efficiency and technical progress. These two patterns of decomposition provide different perspectives about the driving components of productivity. I propose a framework that merges them and produces a cross dimension. Industry productivity can not only be allocated as firm contributions, but also its explanatory factors can be illustrated analogously. It is developed by specifying firms that are on production frontiers, measuring the deviation from frontiers, and integrating explanatory factors with firm dynamics. A difference-in-differences approach is also considered to examine productivity dynamics in the counterfactual context. As an empirical exercise, the framework that integrates productivity decomposition with productivity dynamics is applied to firm-level data sets and reveals industry features.

2. "Hedonic imputation with tree-based decision approaches"

Linear hedonic regression is commonly utilised to estimate missing prices of unmatched products, but the linear assumption of prices in product characteristics is dubious. Product characteristics are not perfectly substitutes in real purchases so that the prediction capacity of linear models is challenged. I consider alternative estimations of hedonic prices by introducing tree-based machine learning models that are highly recommended for prediction accuracy. A tree decision structure is compatible with consumer preferences when product characteristics are complements. Model performance metrics based on scanner data confirm the reliability of machine learning in price predictions. I find that random forests are the best fitted model with largest R^2 -type measures among a series of tree-based models. Price indexes with random forests display correct predictions that are robust in single, double and full imputation. The variable importance estimated for product characteristics is consistent with real coefficients of hedonic functions in price simulation. It is advisable that tree-based decision approaches, especially random forests, can be effectively employed for unmatched products in hedonic imputation.

3. "Industry-level value added and productivity decompositions"

Decomposing productivity into explanatory factors has been extensively used for identifying the responsible components of economic growth. Drawing on a non-parametric model, this paper decomposes value added and productivity into explanatory factors for Australian market sector. 12 selected industries and 16 market sector industries are analysed, featuring an industry-level decomposition. The results indicate that technical progress has supported the increasing productivity, though it is slightly offset by input mix factor and value added inefficiency. The effect of share weighting is confirmed when computing contributions to overall performance from industries. Financial and insurance services contribute to overall productivity due to large market shares and technical progress while the mining industry tends to have the largest negative impact on efficiency and

leads to overall productivity deterioration. The priority of efficiency is empirically confirmed for Australian industry production.

Last updated: September 17, 2020