

# **Recent Developments in the ABS Productivity Measurement Program**

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# Outline

- Overview of the ABS multifactor productivity statistics
- Recent progress
- Challenges and data gaps
- Opportunities for further improvements and new stats

# Multifactor Productivity Measurement Framework

- Solow (1956) new classical growth accounting framework
- Modern growth accounting framework
  - Refined measures of capital and labour input (Griliches & Jorgenson 1967)
  - Index number theory (Diewert 1976)
  - Industry level MFP statistics (Jorgenson et al. 1987)
- International standard and best practice
  - The release of BLS (1983) MFP statistics
  - OECD Productivity Manual (2001)

# Brief History of ABS MFP Statistics

- The ABS *market* sector MFP statistics
  - Research on capital stock
  - First information paper in 1989
  - Occasional paper on productivity measurement issues by Aspden (1990)
  - Regular release of market sector MFP statistics from 1994
  - Incorporated into ASNA from 1999
- The ABS industry level MFP statistics
  - Research paper by Zheng (2005)
  - ABS information paper and release of industry level MFP datacube in 2007

# Key Activities of the ABS Program

- Compiling aggregate and industry level MFP statistics
  - Headline MFP measures for ASNA
  - Industry level MFP data cube
- Conducting ongoing research
  - Perennial measurement issues
  - Hard-to-measure industries

# Recent Changes in ABS MFP Statistics

- Implementation of new international statistical standards
  - ANZSIC06
  - SNA08
- Expanded definition of *market* sector
- Two aggregate MFP measures
  - New expanded market sector measures released in ASNA
  - 12 Selected industries MFP statistics released in industry level MFP data cube

## Growth Accounting Analysis for the Market Sector (%)

	1998-99 to 2003-04	2003-04 to 2007-08	1998-99 to 2007-08
<b>Output growth</b>	3.5	3.7	3.6
<b>Contributions to output growth (hours worked basis)</b>			
Capital services	1.7	2.6	2.1
Hours worked	0.7	1.5	1.1
Multifactor productivity	1.1	-0.5	0.4
<b>Contributions to output growth (quality adjusted hours worked basis)</b>			
Capital services	1.7	2.6	2.1
Hours worked	0.7	1.5	1.1
Labour composition	0.3	0.2	0.2
Multifactor productivity	0.8	-0.7	0.2

## Industry Level MFP Statistics: 1994-95 to 2011-12

	Output	Capital	Labour	MFP
A Agriculture, Forestry and Fishing	4.21	0.60	-0.52	4.13
B Mining	3.30	5.41	1.09	-3.20
C Manufacturing	1.00	1.38	-0.69	0.31
D Electricity, Gas, Water and Waste Services	1.39	2.88	1.04	-2.52
E Construction	4.94	1.25	2.22	1.47
F Wholesale Trade	3.52	1.73	0.32	1.47
G Retail Trade	3.71	1.31	1.03	1.37
H Accommodation and Food Services	2.57	0.78	1.01	0.77
I Transport, Postal and Warehousing	3.71	1.67	0.94	1.11
J Information, Media and Telecommunications	4.16	3.77	0.24	0.15
K Financial and Insurance Services	5.68	1.93	0.97	2.78
L Rental, Hiring and Real Estate Services	2.27	4.59	1.22	-3.54
M Professional, Scientific and Technical Services	4.82	1.10	3.18	0.55
N Administrative and Support Services	2.83	0.63	2.57	-0.36
R Arts and Recreation Services	3.52	1.95	1.74	-0.17
S Other Services	2.31	2.07	0.56	-0.33



# Key Research on Hard-to-measure Industries

- Research into Mining Industry MFP
  - Research paper on natural resources input presented at 2010 EMG workshop
  - Research paper on adjusting lags between investment and delivery of capital services presented at 2012 ACE
- Examining MFP measures for Utilities industry
  - Report presented at 2011 PMRG workshop
- Solving puzzles for Rental, Hiring & Real Estate Industry
  - Report presented at 2010 PMRG workshop
- A feasibility study on developing MFP statistics for Health Care and Education industries
  - Report presented at 2010 PMRG workshop

# Research on Measurement Issues

- Integrating market sector MFP with industry level MFP stats
  - Paper on industry sources of Australia's productivity slowdown at Second World KLEMS Conference at Harvard University
  - Incorporated into the upcoming updated ASNA CSM
- Developing measures of labour compositional changes at the industry level
  - Report presented at 2012 PMRG workshop
  - Incorporated into the upcoming updated ASNA CSM
- Capital and labour shares
  - Alternative methods for splitting gross mixed income
- Measurement of capital input
  - Sensitivity analysis of alternative assumptions and approaches

# Challenges and Data Gaps

- Nonmarket industries
- Quality changes, in particular for services related industries
- Continuing debate about the output measurement for Financial & Insurance Services Industry
- Business survey based employment information
- Capital investment by asset types at the industry level
- Natural resources and environment

# Quality Dimensions of Productivity Statistics

- The ABS information paper ‘ Quality Dimensions of Australian National Accounts’ establishes a few criteria on assessing economic statistics
- Market Sector LP Stats rated as A, and MFP as B due to measurement issues with capital input
- Updated National Accounts CSM to be released in December 2012

# Opportunities for Improvements and Addressing Data Gaps

- Developing a full production account in both current price and volume (based on supply-use tables) to support KLEMS analysis
- KLEMS model of industry level MFP measures
  - Separate estimates of energy, material and services
  - Gross output based and the role of intermediate input
- Developing MFP measures at 2 digit ANZSIC level
- Construction of a set of labour accounts to improve labour input measures
- Possible improvements to capital services including survey on asset lives and industry assets splits

# Questions ?