Australian KLEMS estimates

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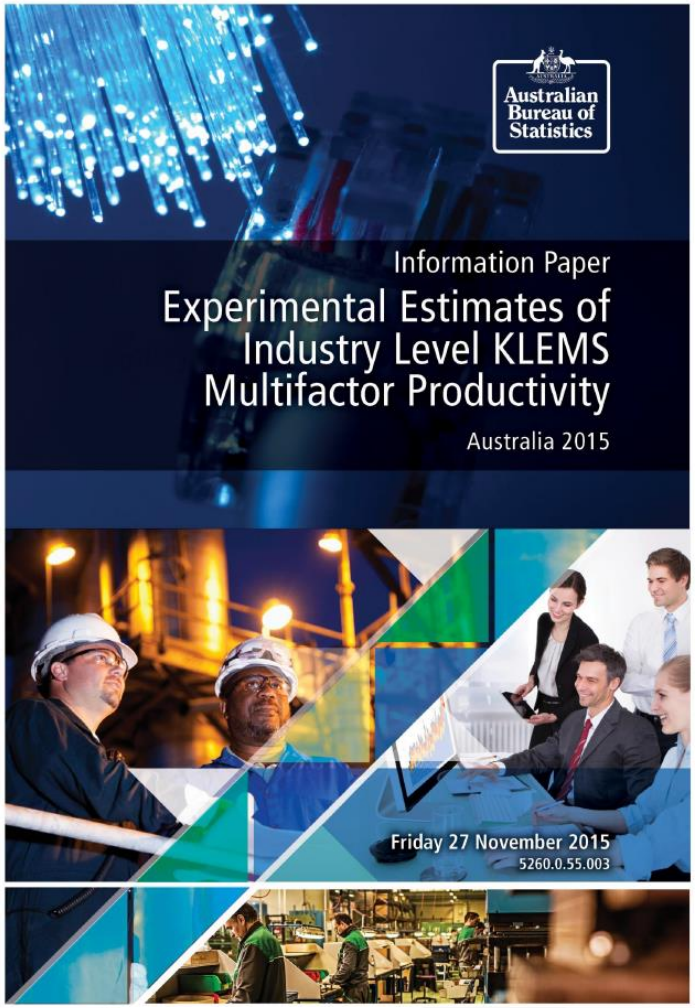


Presentation overview

- Challenges in implementation
- Challenges in derivation
- Australian KLEMS MFP methodology
- Results
- Further research questions/challenges

Challenges in implementation

- Mixed opinions whether Supply Use Tables was fit-for-purpose (especially services)
- Uncertainty surrounding publishing two different MFP figures
- No aggregation across industries

Challenges in KLEMS derivation

1. Supply-Use data

- Supply Use Tables not published by the ABS
- Historical balancing decisions often not recorded
- Balanced results occasionally inconsistent
- Price indexes not always available at Supply Use Product Classification level – broader deflators used

Challenges in KLEMS derivation

2. Alignment with energy accounts

3. Different chaining methods

4. Additivity between intermediate inputs components and Laspeyres aggregate

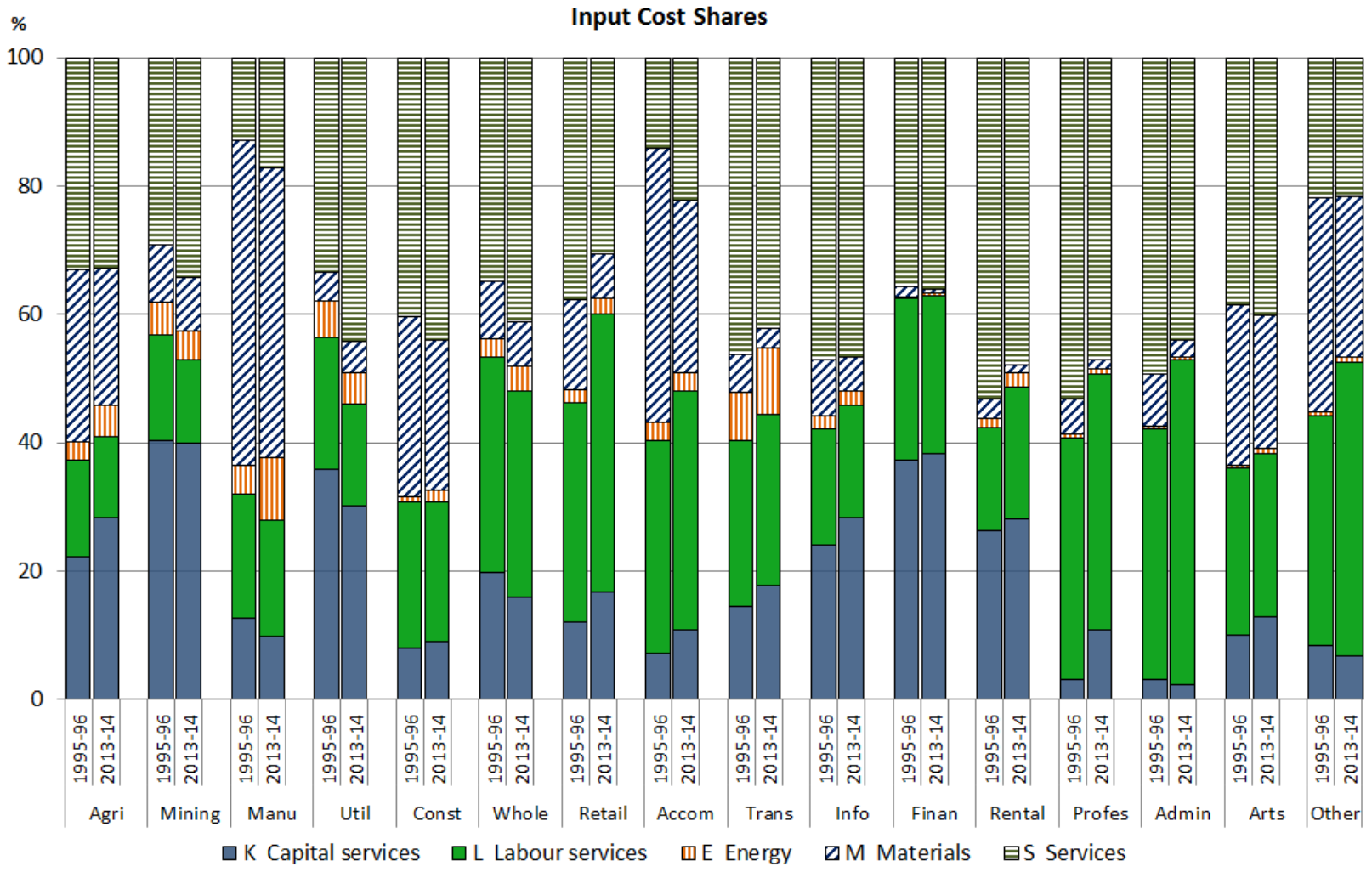
ABS KLEMS Methodology summary

Follows standard growth accounting framework.

Points to note include:

- Mixture of Laspeyres CVMs (Gross Output, total intermediate inputs) and Tornqvist CVM (capital services index, labour composition, E, M, S)
- Alignment of energy products in KLEMS with the ABS Energy Accounts
- No published aggregate market sector estimates

Results – input cost shares

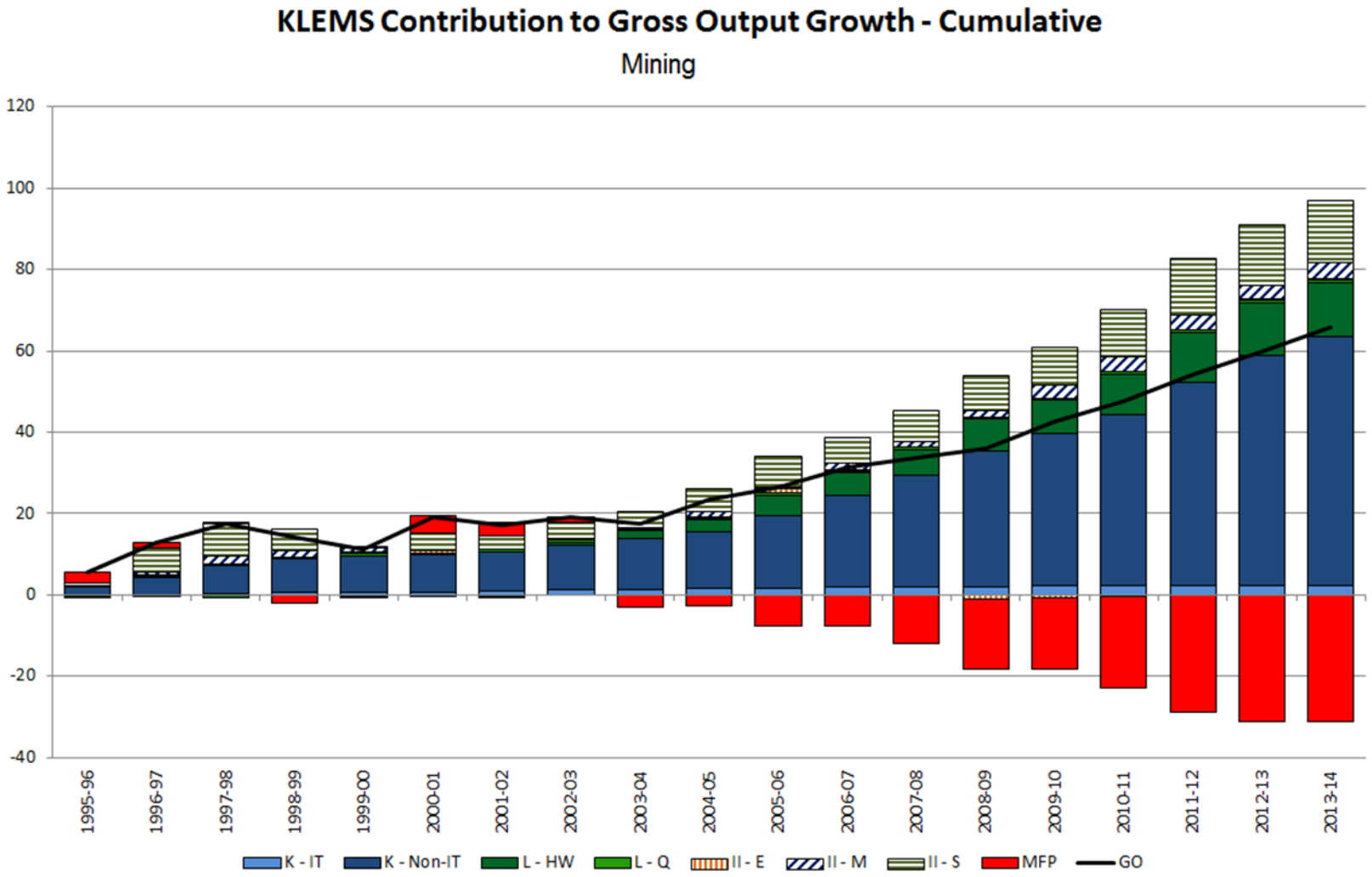


Results – 1995-96 to 2013-14

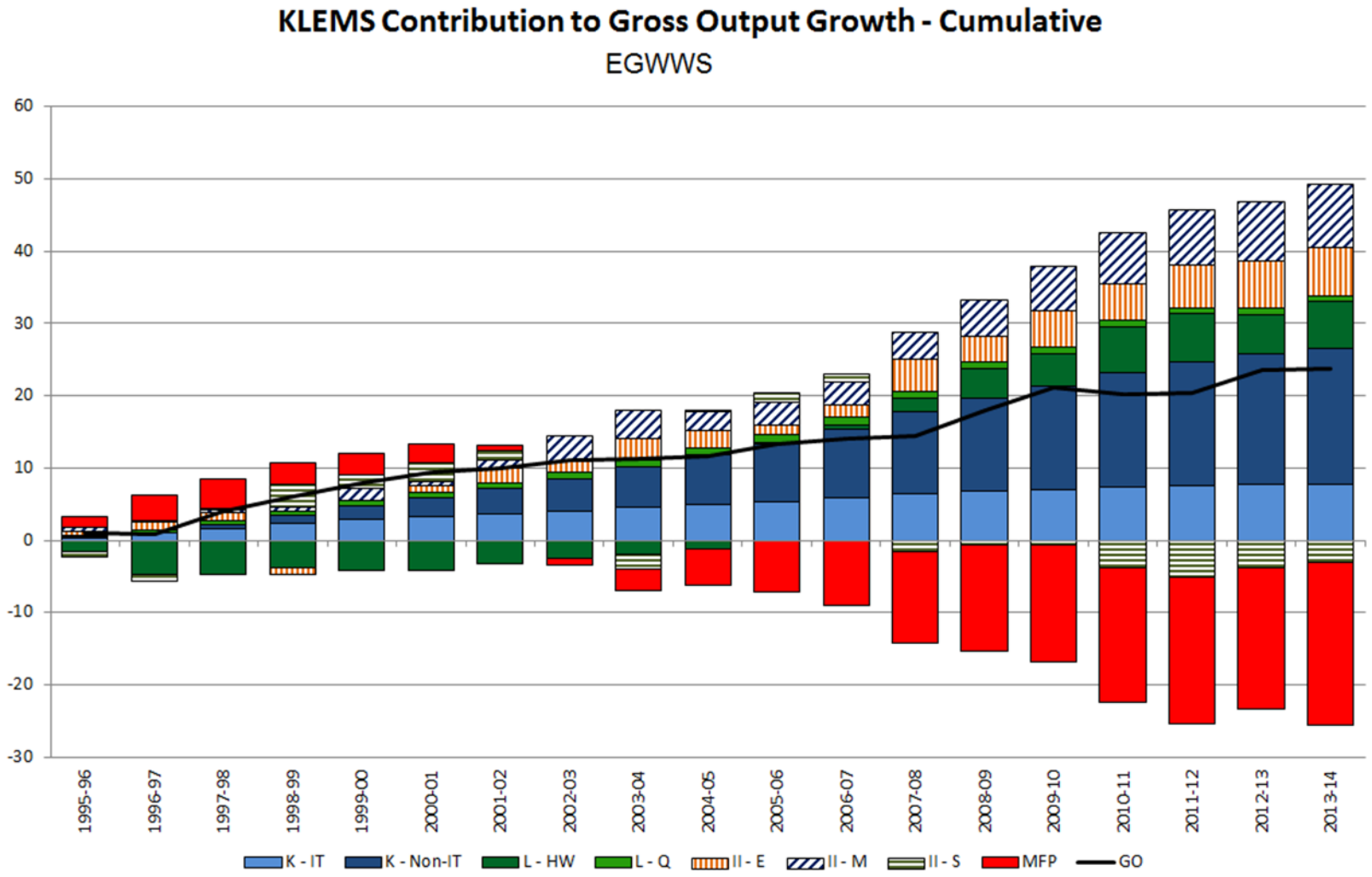
Industry	Gross Output Growth	Contribution from Capital		Contribution from Labour		Contribution from Intermediate Input			Multifactor Productivity (b)
		IT (c)	Non-IT	Hours Worked	Composition	Energy	Materials	Services	
Agriculture	2.1	0.0	0.2	-0.2	0.0	0.1	0.4	0.2	1.3
Mining	3.5	0.1	3.2	0.7	0.0	0.0	0.2	0.8	-1.6
Manufacturing	1.2	0.1	0.2	-0.2	0.1	0.1	0.5	0.3	0.0
Utilities	1.2	0.4	1.0	0.3	0.0	0.3	0.5	-0.2	-1.2
Construction	4.8	0.1	0.3	0.6	0.0	0.0	1.2	1.9	0.5
Wholesale	4.0	0.3	0.5	-0.2	0.2	0.1	0.4	1.9	0.9
Retail	2.1	0.3	0.3	0.4	0.1	0.0	-0.1	0.2	0.8
Accommodation	2.7	0.1	0.2	0.3	0.0	0.0	0.6	1.0	0.4
Transport	2.9	0.1	0.5	0.4	0.1	0.2	0.1	1.1	0.3
Information Media	4.3	0.4	1.1	0.0	0.1	0.1	0.3	2.2	0.0
Finance & Insurance	4.8	1.0	0.3	0.4	0.2	0.0	0.0	1.9	1.1
Rental & Real Estate	2.7	0.8	1.2	0.4	0.1	0.1	0.0	1.4	-1.3
Professional	4.7	0.2	0.2	1.3	0.2	0.0	0.1	2.6	0.1
Administrative	3.6	0.2	0.1	0.9	0.2	0.0	0.1	2.2	-0.2
Arts & Recreation	3.1	0.3	0.5	0.6	0.1	0.0	0.5	1.2	-0.1
Other	2.1	0.2	0.6	0.3	0.0	0.0	0.6	0.4	-0.1

(a) Differences in natural log x 100
(b) Quality adjusted hours worked basis
(c) IT refers to computers and software

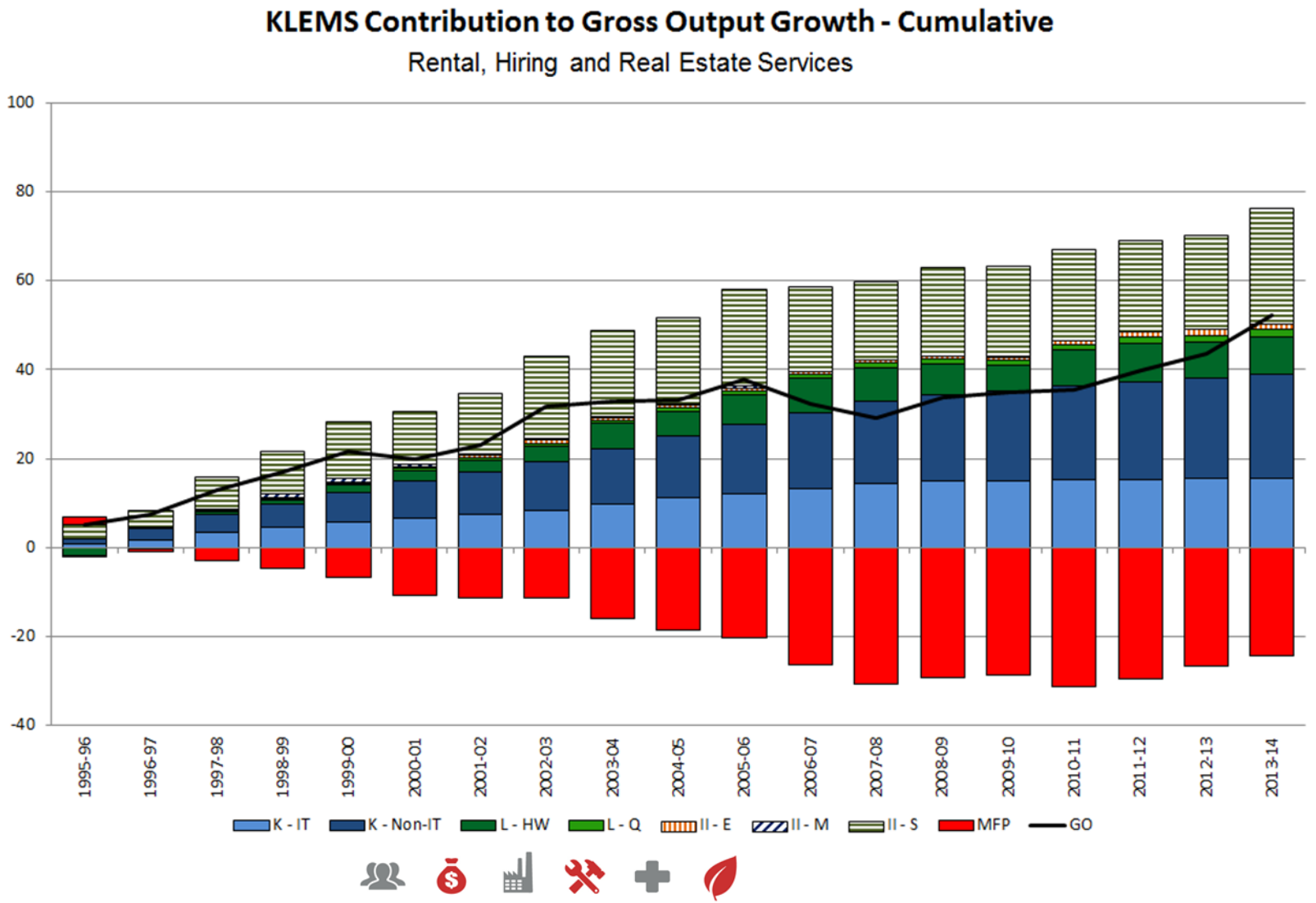
Industry results - Mining



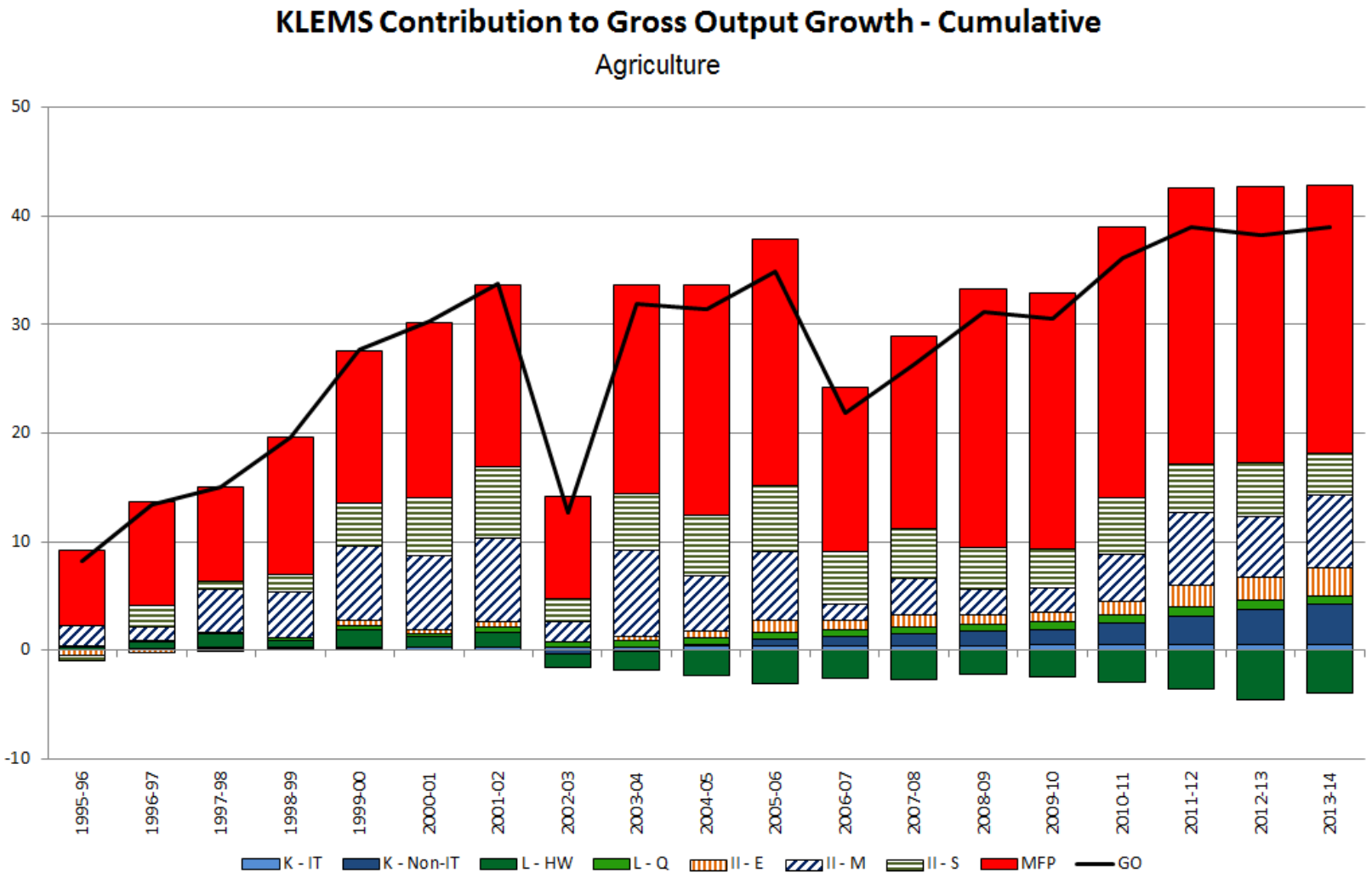
Industry results - Utilities



Industry results – Rental, hiring and real estate



Industry results – Agriculture



Further research – primary inputs

Labour inputs

- Mismatch between industry classification of labour and output
- Labour Accounts

Capital inputs

- Mismatch between capital stock estimates, and capital actually contributing to output
- Capital utilisation assumed to be constant

Further research – constrained optimisation

- Automatic balancing technique being researched for application to supply-use tables
- Will provide a consistent balancing framework, recording of balancing decisions and faster processing
- May also be adopted in I-O tables, and the quarterly accounts

Thank you and Questions?

I would like to thank Derek Burnell and Peter Williams for their assistance in putting together this presentation, and Hui Wei and Marcel Timmer for their comments.