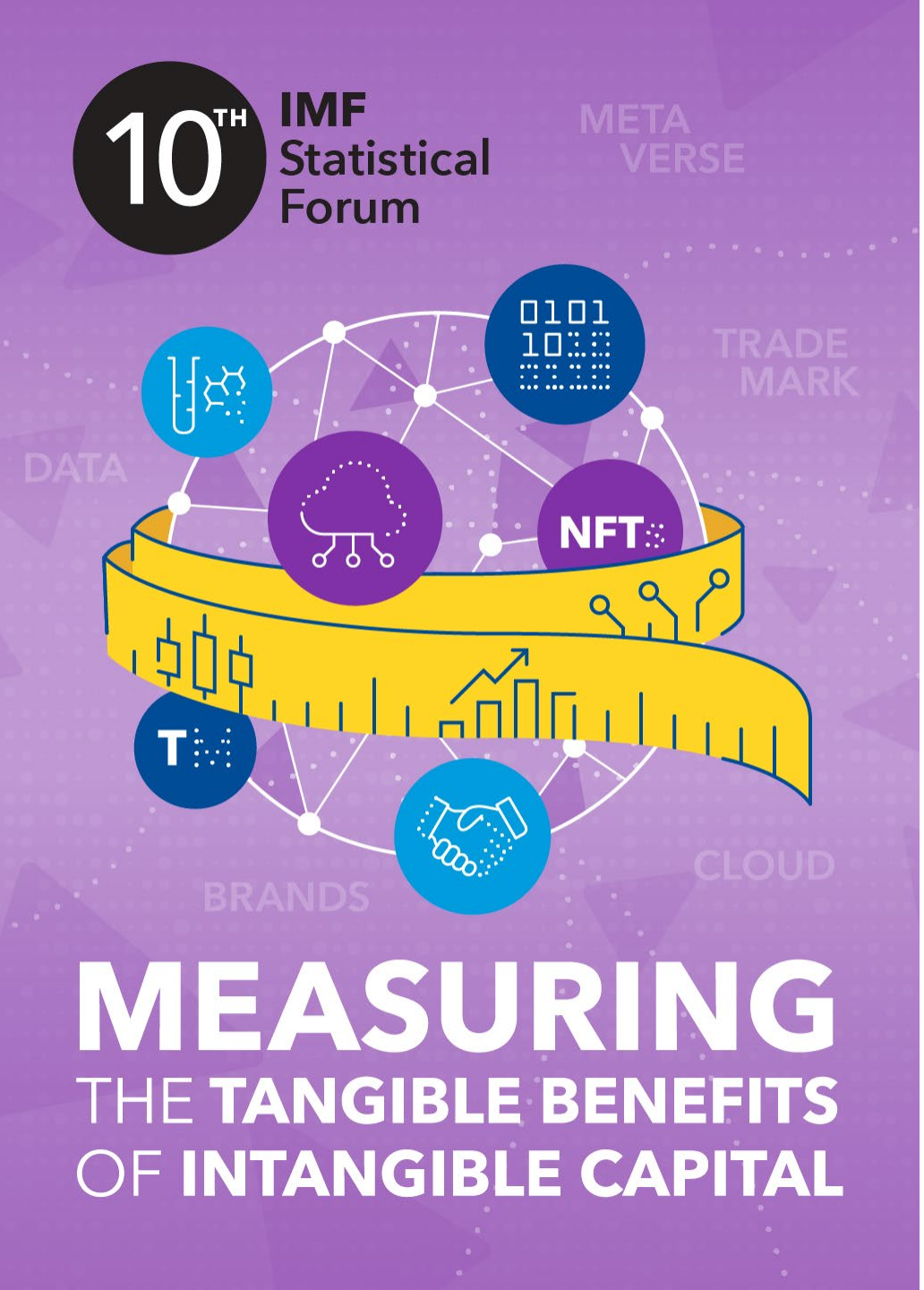

STATISTICS

Valuing Data as an asset – Australian experience

NOVEMBER 19, 2022

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Overview of today

- ABS has produced experimental estimates of
  - Data-related capital formation
  - Data-related capital stock

- Presentation today will cover:
  - Methods and assumptions used to produce estimates
  - Values and comparison with official ABS statistics
  - Our current areas of focus

Valuing Data-Related Capital Formation

- An observable market price for data doesn't (usually) exist
- ABS employed a sum of costs approach, as pioneered by Statistics Canada
- Labour costs:
  - Select occupational groups that are generally associated with converting observations into useable data stores
  - Assume upper and lower bounds on proportion of time spent producing data
- Intermediate inputs:
  - Costs such as software / hardware, electricity, telecoms, non-direct salary, etc
  - Assume 50% of labour costs
- Cost of Capital assumed at 3% of above

Valuing Data-Related Capital Formation

- Some limitations to this approach:
  - Detailed occupation data is only available from the Census of Population and Housing (every 5 years in Australia)
  - Occupation classifications don't necessarily reflect the current types of occupations in the digital economy
  - Estimates overlap to a large extent with components already captured in gross domestic product, so cannot be directly added in

Valuing Data-Related Capital Formation

Estimates of Data Related Capital Formation (Current Price)

	2006	2011	2016
AUD millions			
lower bound value	19,790	25,951	35,512
upper bound value	25,543	33,682	46,728
Annual growth rate			
lower bound value		5.6%	6.5%
upper bound value		5.7%	6.8%
Share of total Gross Fixed Capital Formation			
lower bound value		7.0%	8.5%
upper bound value		9.1%	11.1%
As a percentage of total GDP			
lower bound value			2.2%
upper bound value			2.8%

Valuing Data-Related Capital Stock

- Next step is to calculate capital stock estimates. Again, we have followed Statistics Canada's lead

- We employed the Perpetual Inventory Method. Missing pieces we need:
  - Annual estimates of capital formation (in current prices)
  - Estimates of price change
  - Estimates of asset life to depreciate asset values over time

- Focus on data assets only. Databases and data science are excluded

- Annual estimates of capital formation in current price are obtained by using Labour Force Survey and Survey of Employee Earnings to extrapolate between Census cycles. Census years are used as a benchmark.

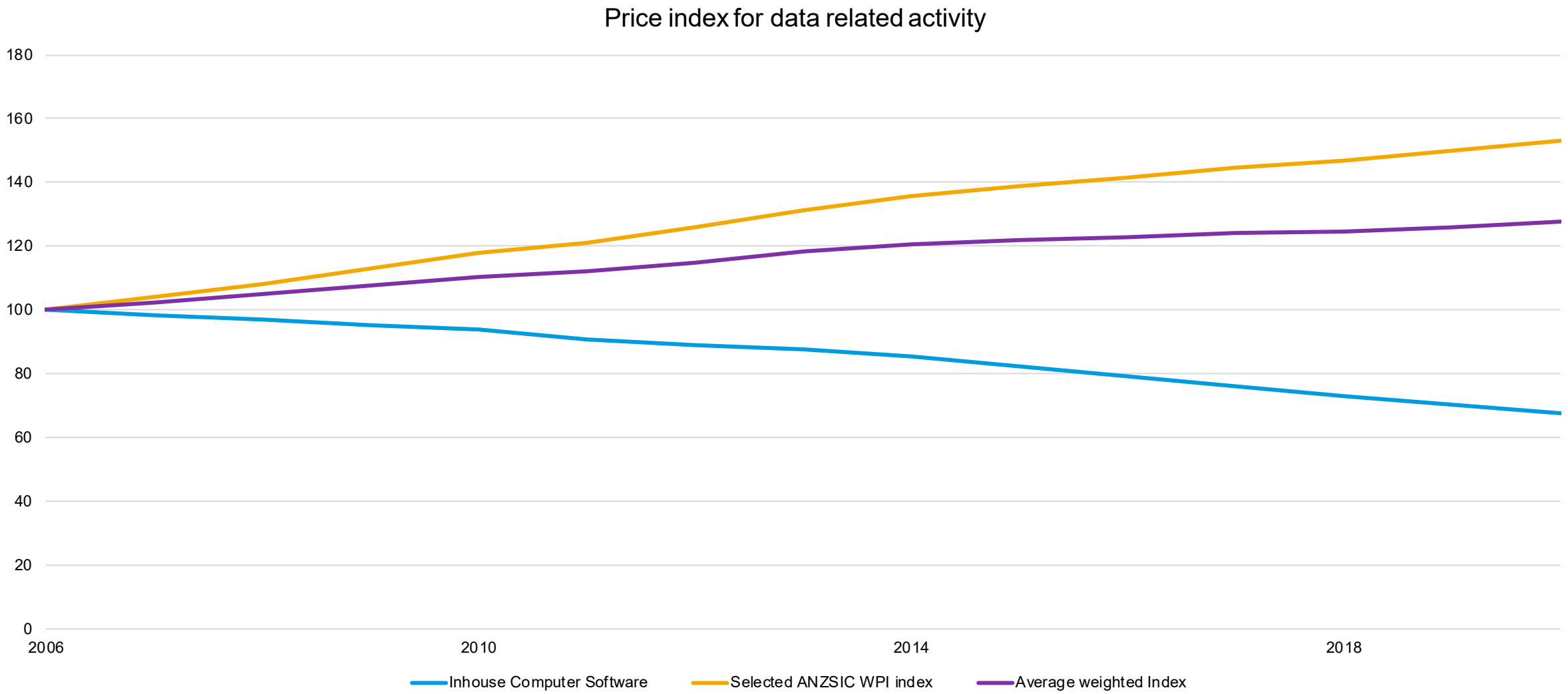
Valuing Data-Related Capital Stock

- For calculating estimates of price change, we considered three approaches:
  - Wage Price Index
  - Software Prices
  - Cost weighted combination

- Different results from the three:
  - Wage rates for data professionals are increasing
  - Prices for software and ICT equipment are falling

- Comparisons follow, but weighted index seems the most appropriate
  - Deflating using this index results in an average annual growth rate for constant price data assets of just over 5% a year

Valuing Data-Related Capital Stock



Valuing Data-Related Capital Stock

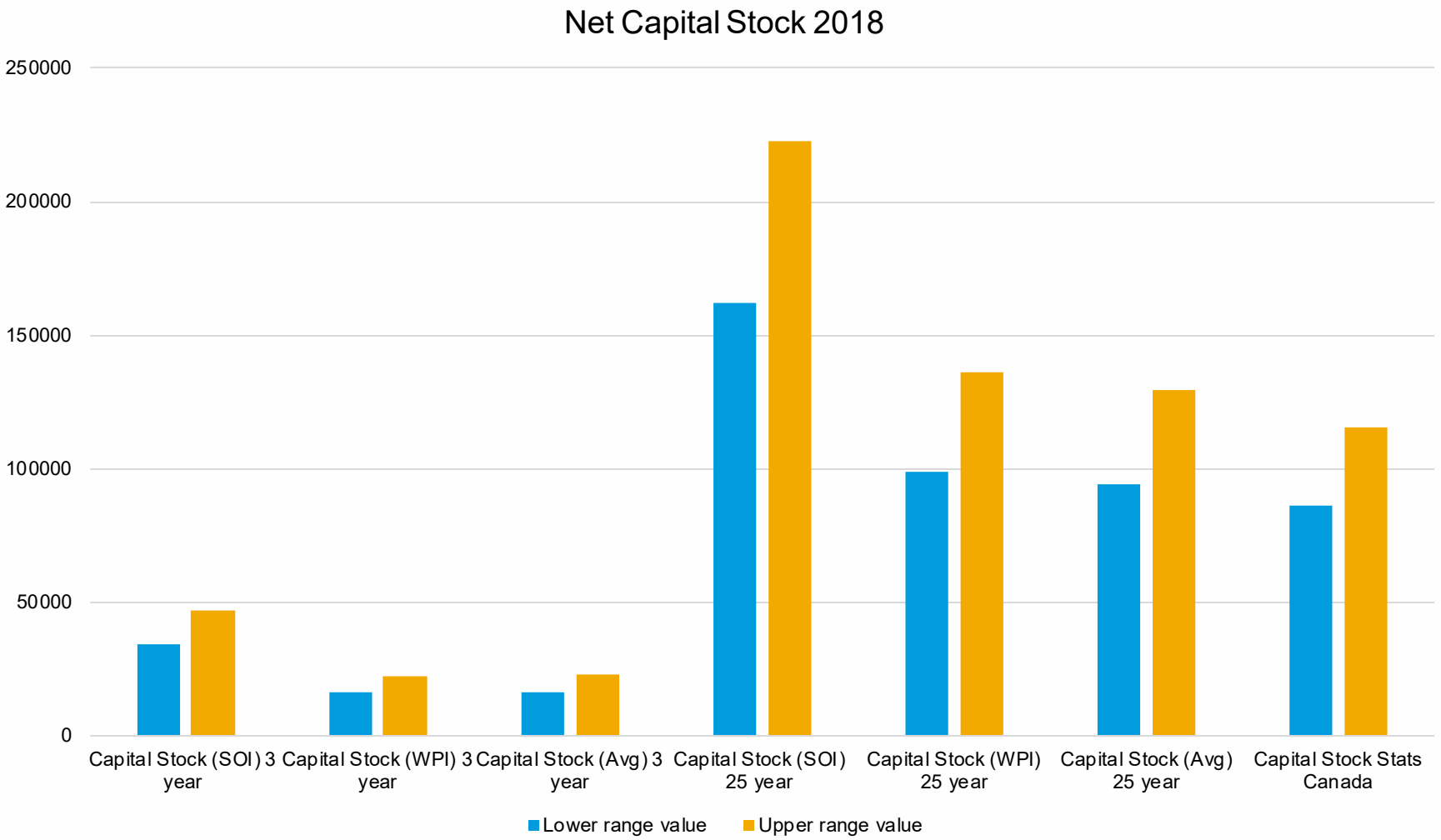
- For calculating estimates of asset lives, we tested two options:
  - 25 years
  - 3 years

- 25 years is based on the Statistics Canada assumption that a firm is expected to draw upon data to gain 'generational' insights for 25 years

- 3 years assumes that most of the value in data exploited now is linked to consumer preferences. This gives a mean asset life of 3 years and a maximum asset life of 5 years

- For context, mean asset lives used for other intangibles:
  - Research and development – 11.3 years
  - Purchased software – 4.5 years
  - Music originals – 3 years
  - Film and TV originals – 3.5 years

Valuing Data-Related Capital Stock



- As a comparison:
  - The upper bound of the sensitivity test would increase balance sheet intangibles by 90%
  - The lower bound would increase balance sheet intangibles by 6.6%

Where to next?

- Updating our experimental estimates based on:
  - 2021 Census data
  - Updated guidance note DZ.6
- Improve our estimates of investment in data-related assets:
  - Occupation mapping (NOC–ANZSCO; 6 digit ANZSCO)
  - Reassess assumptions on share of production activities
- Refine estimates of capital stock for data-related assets
  - Expand coverage of the experimental estimates (databases and data science)
  - Reassess assumptions and collect real world information (asset lives, price indexes)
- Review overlap with existing estimates (e.g. R&D)
- Assess impact to productivity estimates

Updated guidance note - implications

- Guidance Note DZ.6 – Recording of data in the National Accounts recommends that in the absence of information otherwise, All costs associated with *own account* production of data is considered capital formation.

- The note rightly considers that although it is likely that some own account data may be fully consumed within one year, due to practical limitations on delineating this data from data used repeatedly for more than year, that it is recommended to capitalise all *own account* production of data.

- Implications – what does this mean for data captured and used as part of a production process? e.g. agricultural producers recording rainfall and crop yields, retailers capturing stock levels.

- Rough estimates would increase the number of occupations from 16 to 130 – large business employ data professionals, medium/small multitask. Assumptions on upper and lower bounds on proportion of time spent recording data, and mean asset lives need to be considered