

Challenges in Measuring the Modern Economy

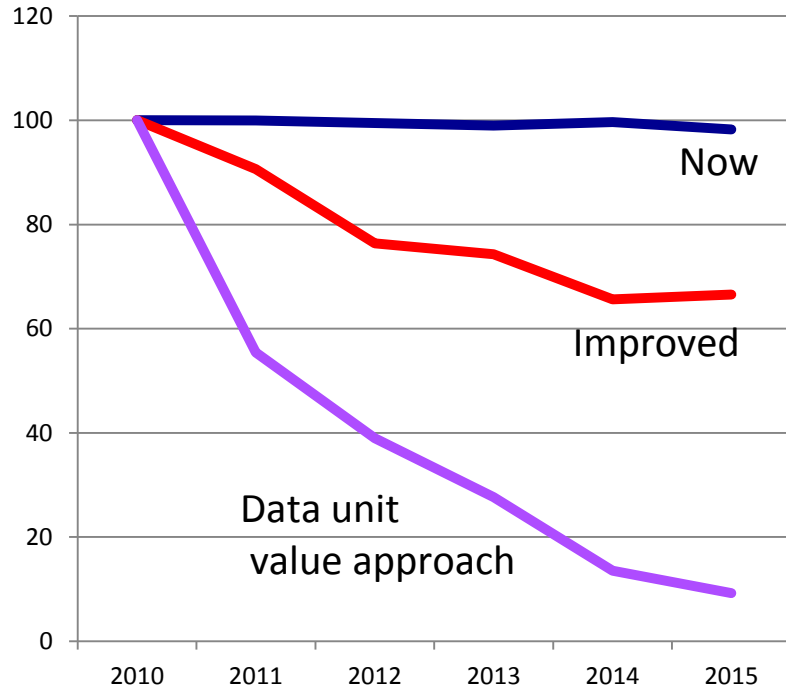
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Deflators

Telecoms services deflators

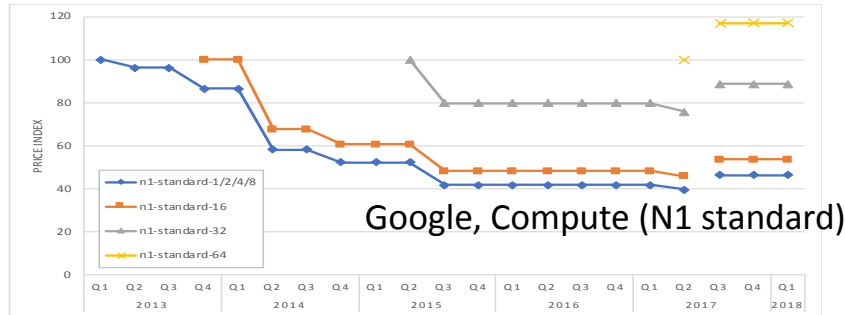


- Other digital-using services
- Capturing consumer substitutions (eg smartphone apps, digital platforms, open source)
- Quality changes, variety, digitisation

Source: Abdirahman et al 2018, ESCoE

Business models

Price of cloud computing services



- Cloud services
- Digital platforms incl 'sharing economy'
- Ad-funded vs subscription models
- Contract manufacturing
- Digitisation

(Coyle & Nguyen 2018)

The production boundary: back to Becker

Households combine time and market goods to produce basic commodities Z_i

$$Z_i = f_i(x_i, T_i)$$

where the x_i are market goods (including capital services of durable goods) and T_i is a vector of time inputs and the partial derivatives of Z_i with respect to both inputs are non-negative. Rewriting the production functions:

$$T_i = t_i Z_i$$

$$x_i = b_i Z_i$$

The t_i and b_i are vectors giving the time and market goods inputs per unit of Z_i . Households combine the inputs via these household production functions to maximise utility

$$U = U(Z_1, \dots, Z_m)$$

in the usual way, subject to budget constraint where Z is the bound on resources Z , and g the expenditure function:

$$g(Z_1, \dots, Z_m) = Z$$

The expenditure function includes expenditure on both market goods and time; these are not independent because time can be converted into more market goods by spending more time at work and less in consumption. There is therefore a single constraint:

$$\sum p_i x_i + \sum T_i w' = V + Tw'$$

where the p_i are the prices of the market goods, and w' is a vector of wages paid for hours of work, and V is other income. Substituting in the production functions, this can be written as:

$$\sum (p_i b_i + T_i w') Z_i = V + Tw'$$

The full price of the goods consists of the sum of the prices of the market goods and time used in production.

