

Comments on
‘What Can Be Done to Measure
Productivity Better’
by Chad Syverson

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I. Review of the Paper

0. Background

Measuring productivity is a major priority

1. Productivity Measures

Productivity = output-to-input ratio

⇒ Consider measurement of outputs and inputs sequentially

I. Review (Continued)

2. Challenges in Output Measurement

Three basic problems

Price index accuracies

Defining appropriate output measure

Uncounted output

* There can be a connection between the define-the-output measurement challenge and the quality quality-adjustment challenge: Both are related to unmeasured quality.

I. Review (Continued)

2.1 Expenditure-Based Output Measures or Price Index Accuracies

Output = Expenditures deflated by a price index

Sources of inaccuracy

Quality change

New products

Substitution bias

I. Review (Continued)

Practice of statistical agencies

Differential treatments

Some products are adjusted for quality change with varying degree of sophistication.

Many products are not adjusted for quality change.

⇒ May distort aggregate output measure

eg. IT-related goods grew rapidly

driven by a large price decrease

thanks to hedonically adjusted quality of goods.

I. Review (Continued)

The paper poses an important question:

‘How statistical agencies choose which limited set of products receive more intensive quality adjustment?’

The answer:

Balance the benefit and costs of quality adjustment for a product, then prioritize.

I. Review (Continued)

In micro data

typically, no producer-specific price index

⇒ Price differences remain in output and productivity measures

Not only: Quality and efficiency differences

But also: Idiosyncratic demands shifts

Market power variation

I. Review (Continued)

Product turnover is also difficult to measure by the current small-sample approaches of most statistical agencies.

Proposals

Develop a systematic evidence on new goods entry and product turnover among industries, over time or across countries.

To quantify product variety effects, identify more sharply the parameters of utility and production function.

I. Review (Continued)

2.2 Difficulties Defining the Output

Financial industry: What is the output?

Across an insurance company and a bank

Within banking, lending? what about other services?

Healthcare: health

Lag: healthcare services \rightarrow change in health

Noise in the causal relation between the two

No easily observable cardinal measure of health

Also, education, government and nonprofit organizations

I. Review (Continued)

Conventional measure of output of these industries

Input use

⇒ Strong assumption about productivity
at the extreme, productivity is constant

‘Quantity–augmentation’ approaches are one ways to try

e.g. U.S. Bureau of Labor Statistics(BLS)

Output of the primary and secondary education

⇒ Adjust enrollment by attendance.

I. Review (Continued)

2.3 Uncounted Output

Home production

Environment goods

Health: Life expectancy

“free” digital goods

⇒ Purchase of complementary goods

Imputation of consumer valuation using advertising revenue

I. Review (Continued)

3. Challenges in Input Measurement

3.1 Labor

Variation in worker quality

Education, training, overall experience and tenure at a firm.

⇒ One may merge employment quantity with workers' average level of education, training, experience, etc.

I. Review (Continued)

Another approach: Measure labor inputs using wage bill

Justification

- Market wages reflect variations in workers' marginal productivity

Problem

- Effects of the competitive structure of a local labor market
- More productive firms share rents with employees

⇒ More direct measure of labor productivity is needed.

I. Review (Continued)

3.2 Intermediate Inputs

Inaccuracy of input price indexes

Product(input) turnover, quality differences

3.3 Capital

- (i) Unmeasured quality variation
eg. Vintages

Capital has a dearth of proxies for quality,
while labor often has measurable correlates of quality(such as
education, experience).

- (ii) Not stock, but flow of capital services

I. Review (Continued)

(iii) Perpetual inventory method

Depreciation rate

Investment deflators are noise-laden

(iv) Intangible capital \Rightarrow Unmeasured

eg. Brand value, production know-how, organizational culture,
relationships with suppliers or distributors

Interpret productivity as including the effect of intangibles?

\Rightarrow Blurs the mechanisms through which intangibles add to production.

I. Review (Continued)

3.4 Estimating Output Elasticity

Combine disparate inputs into a single, composite input

Weight: the elasticity of output with respect to the input

Actual measurement

- Cost minimization \Rightarrow elasticity = Cost share

Direct measures of expenditures on capital inputs are rare.

Not assumption-free: Adjustment costs

- Estimate the production function: Transmission bias

I. Review (Continued)

4. Market Power

‘Residual’ TFP

= ‘Technology’ concept of TFP(Production function shifter)

+ Market power

Statistical agencies do not make adjustment to productivity measures for market power

but would be worthwhile

* Use of production data to infer the magnitude of market power

I. Review (Continued)

5. Priority Areas to Address

(i) Improve and Expand Price Data

- For aggregates

a) Quality adjustment

- ⇐ Select areas of priority by cost–benefit considerations

b) Programs to measure product turnover more systematically

I. Review (Continued)

c) Leverage existing digital pricing information
⇒ Will not impose considerable extra costs

–For micro level

Producer-specific prices

⇒ Will open up an entirely new set of opportunities

Although they are rare

I. Review (Continued)

(ii) Expand the Set of Measured Outputs

Measure what the sector actually produces.

a) Healthcare

⇐ An easy case to make that we should improve
because an enormous amount of resources are
expended

Micro-level: Survival and/or readmission rate

Macro-level: Quality-adjusted life expectancy

I. Review (Continued)

b) Household production

Time-use surveys offer important information

c) Improve Capital Measurement, Especially Intangibles

Capital is probably the most difficult input to measure.

Intangibles \Rightarrow Has become a highly important factor

\Rightarrow Perhaps the most pressing of the capital measurement issues

I. Review (Continued)

Author's last words

None of these proposals would be trivial to implement.

Progress will require a considerable research and organization building

However, these challenges are matched by a higher expected return to collecting and analyzing data.

- a return that should pay for itself many times over in terms of our understanding of productivity and the economy.

II. Comments

- I do not have particular objections about the paper.
- Mainly asking more suggestions:
 - More explicit criteria for cost–benefit analysis wanted.
 - Further suggestions are helpful in expanding the set of measured output.
 - How to proceed on intangibles.
Relatedly, market power in TFP

II. Comments(continued)

On Cost–Benefit Analysis

- The proposal that areas of priority for quality adjustment should be selected by cost–benefit considerations is very important.
- More specific criteria for prioritization will be appreciated.
- Sometimes, a large number of small improvements without apparent policy relevance are proposed in revisions of statistics.
- I provide two examples below.

On Cost–Benefit Analysis(continued)

(i) Uncertainty of success

Area A: Small benefit, but sure improvements

Area B: Large benefit, but success not secured

(eg. Healthcare, education, financial services, etc.)

Suppose that expected cost–benefit ratio of Area B is a little lower than that of Area A (not by a large margin).

Should statistical agencies obey strict cost–benefit analysis?

Or, they can venture into a risky project?

Of course, the choice will be made on the actual, though.

On Cost–Benefit Analysis(continued)

(ii) Value of information: Statistical integrity vs policy relevance

A statistical system has its own logic and integrity.

So, it is very valuable to improve statistics in accordance with the logic and integrity of a statistical system.

But statistics which policy–makers need may require partial, sometimes ad hoc, treatment of a specific area.

And the methods used to estimate such statistics could be very different from those of other parts.

It is not easy to compare statistical integrity with policy relevance

II. Comments(continued)

On Expanding the Set of Measured Output

- On expanding the set of measured output, specifically for healthcare, more detailed suggestions would be helpful. Examples include:
- Hospitals: the paper proposes survival/readmission rate as output
Not all patients are for acute care (in Japan)
Not in all diseases, survival is the most important outcome.
(eg. Heart failure, hip replacement, diabetes mellitus, etc.)

Can selective diseases for which survival is important be picked up?

Should other metrics such as complications be also included?

On Expanding the Set of Measured Output(continued)

- Aggregate-level (Population?) health: the paper proposes QALYs as output

Even at aggregate levels, various effects other than that of healthcare remain in quality-adjusted life expectancy.

(Some studies indicate that around a half of the improvement in the QALYs is due to healthcare in some diseases.)

How to separate the effect of healthcare from that of other factors?

Or, restrict attention to people who received healthcare?

On Expanding the Set of Measured Output(continued)

Directly measuring the QOL of the population is too expensive.

Are there easy methods to measure the QOL?

Some researchers propose methods to transform Symptoms and Impairments into QALYS.(Stewart, Rosen and Cutler)

Clinical laboratory test results such as blood pressure and blood glucose level can be used to predict future complications and health, so that population health can be inferred from these test results.

Here, big data on test results on the population basis would be helpful.
They are available in Japan.

On Expanding the Set of Measured Output(continued)

- Comparability of quality-adjusted output and productivity measures across industries.

Chandra, Finkelstein, Sacarny and Syverson (2016) compares productivity of health care and manufacturing sector.

Productivity measure for health care: Survival

Productivity measure for manufacturers: Usual productivity?

Is it OK to use such disparate measures to compare productivity across industries?

II. Comments(continued)

On Intangibles

- As for intangibles, there is a wide variation of quality.
- Their valuation in firms' balance sheet may not be so reliable.
- How to proceed? Suggestion, please.
 - Research o individual components of intangibles?
Which ones are of high priority?
 - Management: Bloom, et al. \Rightarrow Measure of quality of management

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On Intangibles(continued)

- Related comment

Brand \Rightarrow Product differentiation \Rightarrow Market power

Other intangibles often lead to differentiation and high quality,
which confers a firm market power.

(eg. Production know-how, organizational culture, management, etc.)

If brand and other intangibles which confer a firm market power are included in the capital,

then, there is no reason to exclude the effect of market power from the measured TFP as proposed on pages 15–16 of the paper.