Does GDP Tell Us What We Need To Know?

Discussion by Tamim Bayoumi

At 5th IMF Statistical Forum

November 16, 2017

Measuring the Digital Economy

- **(Updated) issue**. "You can see the ~~computer~~ digital age everywhere but in the productivity statistics".

- **Complication**. Computer-related GDP is relatively easy to calculate as purchases feed directly into final spending, so all that was needed is correct price index. Internet firms generally produce an intermediate good whose value added is easy to lose in expenditure-based GDP.

- **Results**. Both papers propose ways around measurement issue and argue digital impact is small(ish) as size of digital economy is small. Surely correct.

Health Warning

- Title of session a bit of a misnomer. Both papers argue GDP is a sensible approach as measures actual payments. I tend to agree GDP is more "objective" that other calculations since money actually changes hands.

- The first paper notes some estimates peg consumer surplus from digital economy as ten times their impact on GDP.

- A natural question is whether this ten times figures is large compared to other industries. If not, fine. If it is—and it certainly sounds large—what drives this large effect what does this imply about the digital industry?

Measuring Consumer Inflation in a Digital Economy

- **Summary**: A really sensible paper with solid analysis and views.
- **GDP impact**: “many of the criticisms of GDP statistics are based on misunderstandings of the conceptual framework and purpose of GDP, or on exaggerated perceptions of the likely size of the effects.”
- **Is issue novel?** “quality change of existing products, the emergence of new products, and free goods are not new issues, but the digital economy, with its fast pace of innovation, has brought them to the fore.”

Questions Posed, Questions Answered

- **Conceptual issues**: Three issues discussed:
  - Faulty adjustment of prices for changes in quality
  - Lags in introducing new goods into the consumption basket.
  - Existence of “free” goods.

- **Analysis**:
  - Focuses on first issue, faulty adjustment for changes in quality of goods. Price indexes used by statistical agencies underestimate change in quality of goods.
  - Quibble. Why is faster growth called a “worst case scenario?

Answer Seems Convincing

- **Approach**.
  - Calculate likely upper ranges of price biases.
  - Always part of GDP (benefits of variety?)
  - Multiply by sector weight.

- **Result**. Impact of digital economy is small(ish) as weights are small.

- **Larger biases?** Produce implausible long run changes in living standards.
  - Reminds us biases are not all in one direction.
  - Early twentieth century goods included asking for directions (versus Google maps) and twice-a-day postal services (versus emails).

Measuring the ‘Free’ Digital Economy

- **Issue**. This paper deals with the third conceptual issue discussed in the first paper—“free” digital goods. Since goods are “free” they are not in final spending and hence not in expenditure-based GDP.

- **Approach**. “Eyeballs” approach, similar in concept to network TV. Barter transaction, consumers watch adverts as well as content, including own advertising to sell premium versions.

- **Solution**. Calculate value added of “free” goods from another source—the value added used to create the ads, including for own products.

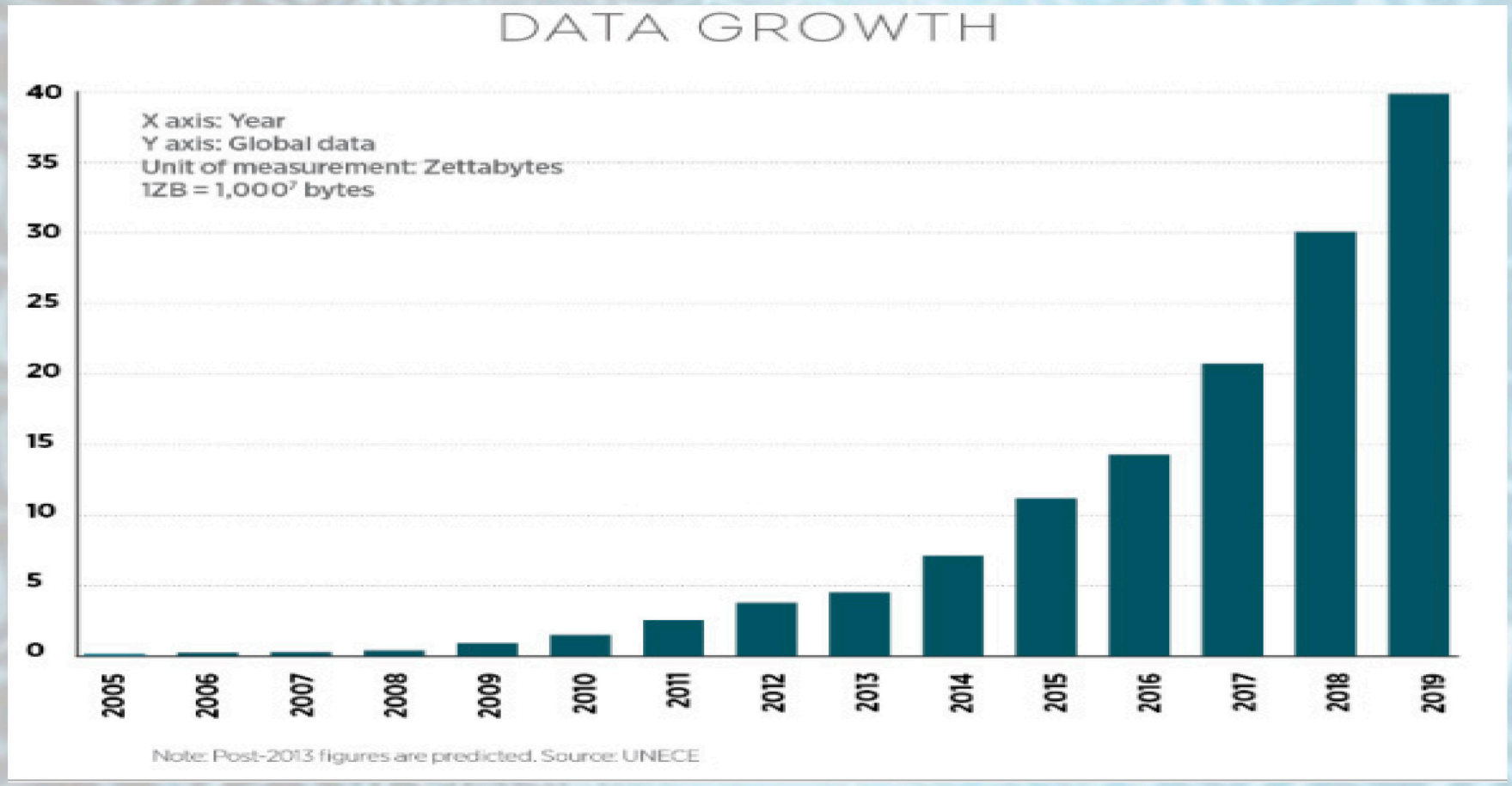
What is Being Bartered?

- **Approach works well for Internet 1.0**. Quote from paper "But most Web sites target a general audience and have advertising unrelated to the precise media services provided."

- **Authors seems slightly bemused by Google Maps**. This apps does not sell goods, have prominent adverts, or a premium version.

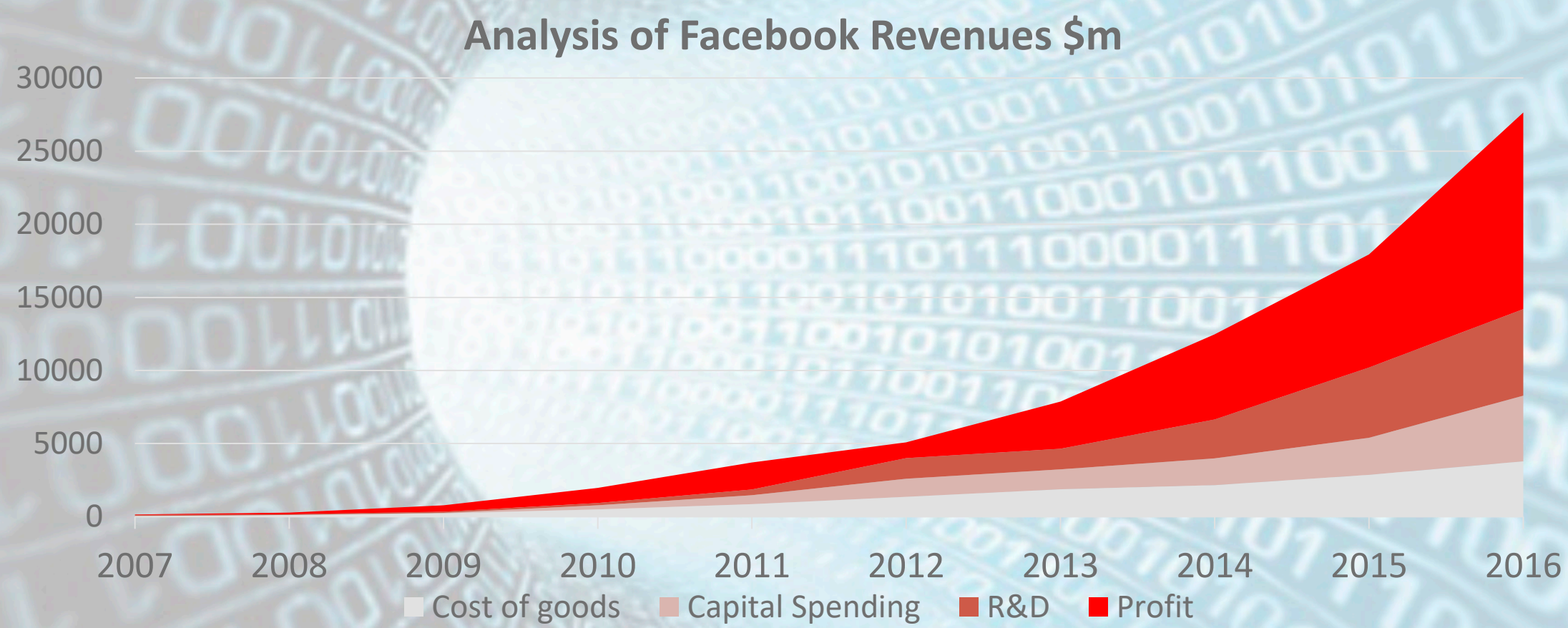
- **Google is part of Internet 2.0, which provides "free" services to track people**. Data is then analyzed using AI, and information on highly targeted audiences is sold to ad agencies (and Russians).

This is a Recent Business Model



Source: UNECE

Facebook Business Model



What is Facebook's Value Added?

- **Facebook 2016**: 4th highest capitalized US firm, revenues of $27b split:
  - 49% profit
  - 21% R&D (presumably analyzing big data)
  - 16% capital expenditures (presumably servers for big data)
  - 14% running costs

- **Value added can be looked at from two angles**:
  - Income side: Large value added from profits and labor spending (including R&D)
  - Spending side: capital spending on storing data (servers) and analyzing it (R&D).
  - *Use deflators on spending to bring two concepts together*.

What Do Calculations Reveal?

- **Major implied change in R&D deflator**:
  - Assume capital expenditures are for IT communications equipment.
  - => relative price of R&D falling 10% a year since 2007 instead of being flat.
  - Implies a much large R&D capital stock as AI is developed.

- **Impact on GDP is limited**.
  - 2016 Google & Facebook revenues were 0.6% of GDP, value added was 0.5%.
  - Capital expenditure and R&D was 0.2% of GDP. Adding hugely to value added.
  - But impact only 0.3% of GDP over almost a decade.
  - Total non-man R&D only 0.4% of GDP—half from to Google and Facebook.

Business Digital Data

- **Action**. GE adds sensors to a wind turbine. Result is it only gets serviced when needed, rather than once a year.

- **Effect**. Enormous gain in efficiency of turbine servicing. *But* it seems unlikely that the deflator for servicing is falling rapidly.

- **Issue**. Just like R&D for Facebook and Google, deflator for servicing spending by GE does not adjust for technological change.

Conclusions

- **The digital economy impact on growth is small**. Prices may be falling fast, but the sector is small.

- **But impact is likely to grow**. Internet 2.0 is widening and deepening the impact over coming years as digital data becomes ubiquitous.
  - Consumer data. Need new deflators for R&D involving big data analysis.
  - Industrial data. Need to think how to capture in GDP statistics.

- **Wider application?** Looking at value added on income side and implied R&D deflator could apply to industries such as pharmaceuticals.