Readings for Erik Brynjolfsson's NBER Digitization Tutorial
March 4, 2020

Measuring the Digital Economy

Recommended readings:

1. Unmeasured Inputs: Intangibles

Brynjolfsson, E., Rock, D., & Syverson, C. (2020, forthcoming). The productivity J-curve: How intangibles complement general purpose technologies. *American Economic Journal: Macroeconomics*. University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2019-33: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3346739

Hall, R.E. (2001). The stock market and capital accumulation. *American Economic Review, 91*(5), 1185–1202. https://www.aeaweb.org/articles?id=10.1257/aer.91.5.1185

2. Unmeasured Outputs: Free Goods

Brynjolfsson, E., Collis, A., & Eggers, F. (2019). Using massive online choice experiments to measure changes in well-being. *Proceedings of the National Academy of Sciences, 116*(15), 7250-7255. https://www.pnas.org/content/116/15/7250

Feldstein, M. (2017). Underestimating the real growth of GDP, personal income, and productivity. *Journal of Economic Perspectives*, *31*(2), 145-164. https://www.aeaweb.org/articles?id=10.1257/jep.31.2.145

Goolsbee, A.D., & Klenow, P.J. (2018). Internet rising, Prices falling: Measuring inflation in a world of e-commerce. https://www.nber.org/papers/w24649

Optional readings:

1. Unmeasured Inputs: Intangibles

Bresnahan, T.F., & Trajtenberg, M. (1995). General purpose technologies 'Engines of Growth'? *Journal of Econometrics, 65*(1), 83–108. https://www.sciencedirect.com/science/article/pii/030440769401598T

Brynjolfsson, E., Hitt, L.M., & Yang, S. (2002). Intangible assets: Computers and organizational capital. *Brookings Papers on Economic Activity, 1*, 137–98. https://www.brookings.edu/bpea-articles/intangible-assets-computers-and-organizational-capital/

Brynjolfsson, E., Rock, D., & Syverson, C. (2019). Artificial Intelligence and the modern productivity paradox: A clash of expectations and statistics. In A. Agrawal, J. Gans, & A. Goldfarb (Eds.) *The economics of artificial intelligence: An agenda* (pp.23–57). National Bureau of Economic Research Conference Report. University of Chicago. https://www.nber.org/papers/w24001

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Eisfeldt, A.L., & Papanikolaou, D. (2014). The value and ownership of intangible capital. *American Economic Review, 104*(5), 189-194. https://www.aeaweb.org/articles?id=10.1257/aer.104.5.189

Byrne, D.M., Fernald, J.G., & Reinsdorf, M.B. (2016). Does the United States have a productivity slowdown or a measurement problem? *Brookings Papers on Economic Activity,* (Spring), 109-157. https://www.brookings.edu/bpea-articles/does-the-united-states-have-a-productivity-slowdown-or-a-measurement-problem/

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Haskel, J., & Westlake. (2017). *Capitalism without capital: The rise of the intangible economy*. Princeton, NJ: Princeton University Press.

McGrattan, E. R., & Prescott, E. C. (2010). Unmeasured Investment and the puzzling US boom in the 1990s. *American Economic Journal: Macroeconomics*, *2*(4), 88-123. https://www.aeaweb.org/articles?id=10.1257/mac.2.4.88

Peters, R. H., & Taylor, L. A. (2017). Intangible capital and the investment-q relation. *Journal of Financial Economics*, *123*(2), 251-272. DOI: 10.1016/j.jfineco.2016.03.011 https://www.sciencedirect.com/science/article/abs/pii/S0304405X16301969

Brynjolfsson, E., & Saunders, A. (2016). Valuing information technology related intangible assets. *MIS Quarterly*, *40*(1), 83-110. https://misq.org/catalog/product/view/id/1756

Summers, L.H. (2015). Demand side secular stagnation. *American Economic Review, 105*(5), 60–65. https://www.aeaweb.org/articles?id=10.1257/aer.p20151103

Syverson, C. (2011). What determines productivity? *Journal of Economic literature*, *49*(2), 326-

365. https://www.aeaweb.org/articles?id=10.1257/jel.49.2.326

Syverson, C. (2017). Challenges to mismeasurement explanations for the U.S. productivity slowdown. *Journal of Economic Perspectives, 31*(2), 165–86. https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.31.2.165

Tambe, P., Hitt, L., & Brynjolfsson, E. (2012). The extroverted firm: How external information practices affect innovation and productivity. *Management Science, 58*(5), 843–59. https://pubsonline.informs.org/doi/abs/10.1287/mnsc.1110.1446

2. Unmeasured Outputs: Free Goods

Brynjolfsson, E., Hu, Y., & Smith, M. D. (2003). Consumer surplus in the digital economy: Estimating the value of increased product variety at online booksellers. *Management Science*, *49*(11), 1580-1596. https://pubsonline.informs.org/doi/pdf/10.1287/mnsc.49.11.1580.20580

Brynjolfsson, E., & Collis, A. (2019) How should we measure the digital economy? *Harvard Business Review, 97*(6), 14-48 (Nov-Dec). https://hbr.org/2019/11/how-should-we-measure-the-digital-economy DOI: 10.1257/aer.20170491

Brynjolfsson, E., Collis, A., Diewert, W.E., Eggert, F., & Fox, K.J. (2019). GDP-B: Accounting for the value of new and free goods in the digital economy. NBER Working Paper No. 25695 (March). https://www.nber.org/papers/w25695

Brynjolfsson, E., & Oh, J. (2012). The attention economy: measuring the value of free digital services on the Internet. *Proceedings of the 33rd International Conference on Information Systems, 4,* 3243-3261. http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1045&context=icis2012

Brynjolfsson, E., & Saunders, A. (2009). *Wired for innovation: how information technology is reshaping the economy*. Cambridge, MA: MIT Press. https://mitpress.mit.edu/books/wired-innovation

Cavallo, A., & Rigobon, R. (2016). The Billion Prices Project: Using online prices for measurement and research. *Journal of Economic Perspectives, 30*(2), 151-178. https://www.aeaweb.org/articles?id=10.1257/jep.30.2.151

Cohen, P., Hahn, R., Hall, J., Levitt, S., & Metcalfe, R. (2016). Using big data to estimate consumer surplus: The case of Uber. NBER Working Paper No. 22627. http://www.nber.org/papers/w22627

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Nakamura, L. I., Samuels, J., & Soloveichik, R. H. (2017). Measuring the "Free" digital economy within the GDP and productivity accounts. FRB of Philadelphia Working Paper No. 17-37. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3058017

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