Priorities and Directions for Future Productivity Research: A BEA Perspective

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ABSTRACT

This article identifies hard-to-measure services, land/natural resources, and factory-less goods manufacturing as three priority areas for productivity research. It highlights three hard-to-measure sectors for special attention: health, education, and financial services, given the difficulty of measuring prices and output in these sectors. It also argues that with the increased attention to the environment it has become increasing important to incorporate land and natural resources into the production function. Finally, it points out that the classification issues associated with factory-less goods producers have implications for the measurement of inputs and outputs at the sectoral level and hence for productivity estimates.

THE TASK GIVEN TO THE PARTICIPANTS in the panel was to identify areas to which efforts in productivity measurement should be directed. In my view efforts should be turned to three main areas: hard-to-measure services; land/natural resources; and factory-less goods producers.

Hard-to-measure Services

It has been recognized for some time that better measures of the productivity in the service sector are important for understanding productivity trends. Since that recognition in the late 1980s, there have been enormous strides. Yet for hard-to-measure services there are still some hurdles to overcome. The reason is that prices and output for these services are less amenable to measurement than other services. The three hard-to-measure services I want to focus on are: health, education and financial services.

In the United States, the measurement of the output of the heath sector is complicated by the numerous providers that sell products/services that are intertwined. For example, physician offices constitute an industry and one can look at the output of that industry. But the output is not generally an end in itself. These services are often combined with diagnostic services (another industry) and pharmaceutical products (yet another industry) to produce a treatment for some ailment plaguing the visitor to the physician's office. What then is the relevant productivity measure? Are we interested in the productivity in treating the disease or the productivity of the individual providers? Both productivity concepts are important and answer

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different questions. Certainly the productivity in treating diseases is not a matter of simply adding the outputs and the inputs. For some time, the Bureau of Economic Analysis (BEA) has been developing a health satellite account which focuses on treatments of diseases and has paid particular attention to the construction of diseased-based price indexes (Aizcorbe, Retus and Smith, 2008 and Aizcorbe, 2013).

Education is similarly difficult. As Griliches (1970) pointed out, the output of education involves the student's ability as well as the effectiveness of the instructor and the other inputs. More broadly, the attributes of the consumer play a role in determining the output of the producer. This feature of education also affects the measurement of human capital to which much recent attention has been directed in international forums as it relates to the measurement of intangible assets. The BEA has undertaken some preliminary research in measuring education and human capital.

Financial services have received much attention of late because of the role played by financial forces at the outset of the recent recession. However, measuring the output and prices of financial services has been a topic of interest from the beginning of the national accounts (Fixler and Zieschang, 1991). The reason is that the role of financial markets and financial intermediation in the functioning of the non-financial part of the economy has been historically viewed as a black box. Though there has been much progress in measuring the output and price of commercial bank services, especially with respect to implicitly paid-for financial services, the black box has not become a white one. In today's world, especially in light of the financial market triggers to the most recent recession, the attention has shifted to other components of the financial services industry. How do we measure the output of shadow banks? What should be done to incorporate the financial services output of non-financial firms?

Land/Natural Resources

Early characterizations of production commonly included land as an input. The practice fell out of favor in part due to the decreased reliance of most economies on agriculture. But with the attention devoted to the environment and the use of natural resources the incorporation of land in the production function has returned. The papers presented at this conference by Diewert (2013) on the decomposition of productivity growth and by Brandt, Schreyer and Zipperer (2013) show the importance of land and natural resources to the production process.

Putting land and natural resources in the production function has been aided by developments in the accounting for land and natural resources. The System of National Accounts (SNA) 2008 relegates the measurement of natural assets to the recently revised System of Environmental Economic Accounting (SEEA). In particular, the SNA recommends that the disaggregation of land be based on the SEEA.

As with other inputs there are consequences for measurement that arise from technological change. For example, the mining technology known as fracking (hydraulic fracturing) has increased the extent and quantity of subsoil assets. Some exploratory work is going on at the BEA to augment the treatment of subsoil assets.

The BEA is also conducting research on valuing land that will be included in the sector balance sheets in the integrated macroeconomic accounts.

Factory-less Goods Manufacturing

This issue derives from the rise in both globalization and the fragmentation of production. Recent changes in SNA 2008 and the sixth edi-

tion of the Balance of Payments and International Investment Position Manual (BPM6) recommend that establishments that do not actually produce products but control the production - the degree and manner of control are stipulated differently in the two manuals - should be classified as manufacturing firms. Ironing out these differences and coming up with ways to identify Factory-less Goods Producers (FGP) has been the subject of many groups and meetings such as the Task Force on Global Production and the conference on the Factory Free Economy that was held in June 2013 in Paris

Though the FGP issue is largely one of classification, it will likely have a large impact on the measurement of productivity. There are two main implications of the classification of FGPs. First, a large number of workers will be reclassified to manufacturing. Second, there will be a change in the way that international transactions are recorded so that domestic gross output would include the value of foreign manufacturing services. To give some context, consider the fact that in the United States many establishments in the computer and semiconductor industries were classified as wholesalers and are now in manufacturing.

Because these changes involve the reclassification of activity in one sector to the activity in another sector, there will in principle be no change in GDP, though the net exports component can be different. At this point it is hard to estimate the impact of the changes because only now are data being studied from various Census and BEA surveys that asked questions regarding FGP activity.

But the upshot is clear: there will be an impact on inputs and outputs and thus on measured productivity. To give some magnitude of the impact on labour, a study by Federal Reserve economists showed that there would have been 7-30 per cent more manufacturing employment in 2002 and 2007 (Bayard, Byrne, and Smith, 2013). The implementation of any reclassification of FGPs is still some time away as there are many challenges to be addressed. For example, how would time series consistency be preserved? This question is inextricably linked to the question of how the data on FGPs should be presented. Should there be a separate code in each manufacturing industry or should "of which" lines be used when reporting output? Second, suppose that the data reveal that it is not possible to identify FGPs at the establishment level, what would be the alternative? Looking at the enterprise level is the obvious next step but what would be the implications? Why all of this matters, is that it directly bears on the discussions about competiveness and growth; the topics addressed at this conference in the paper by Bart van Ark *et al.* (2013) with respect to Europe.

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