Measuring Output and Productivity in Private Hospitals

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Health care is one of the largest and most important sectors in the U.S. economy, accounting for 7.0 percent of GDP[1] and 10.6 percent of all nonfarm workers[2] in 2010. Within the health care sector, hospitals made up about a third of all employees in 2010. This industry has experienced significant operational and technological advances over the past two decades, but the Bureau of Labor Statistics (BLS) currently does not produce a series that measures these gains. As with most service-providing industries, the difficulty in measuring hospital productivity lies in defining output due to the complex nature of the services provided. This paper presents BLS's initial research on measuring productivity growth in private hospitals from 1993 to 2010.

The BLS labor productivity measures organize economic activity according to industry definitions. This allows for distinct labor pools to be identified and trends in the productive efficiency of workers to be analyzed. Private hospitals are comprised of the non-government portions of two NAICS industries: General Medical and Surgical Hospitals (NAICS 6221) and Specialty (except Psychiatric and Substance Abuse) Hospitals (NAICS 6223). These hospitals accounted for 39 percent of gross output within the health care sector in 2010,[3] and employed approximately 4.6 million workers[4].

In this paper we develop three alternative measures of hospital productivity based on different output concepts. Two of the alternative measures are based on volume of services provided, while the third is based on industry revenues adjusted for price change. Output of private hospitals includes both outpatient and inpatient care. Outpatient services are those that do not require an overnight stay and

[1] Source: BEA http://www.bea.gov/industry/gdpbyind_data.htm
[2] Source: Based on data from the BLS Current Employment Statistics survey
[3] BEA NIPA, Gross Output by Industry
[4] Source: BLS Current Employment Statistics

can be counted as discrete units of output. Inpatient stays, during which patients receive care over one or more days, are more difficult to measure. These stays can be counted as single units of output where output is defined as the entire course of treatment, or they can be disaggregated into more detailed services, where each medical procedure is counted separately. The two alternative output measures based on volume of output—a course of treatment-based measure and a procedures-based measure—correspond to these two concepts of inpatient care. Additional factors such as the quality of care and the outcome of the treatment are also taken into consideration.

Data for the inpatient models are from the Nationwide Inpatient Sample (NIS). The NIS is a comprehensive record of roughly 8 million inpatient stays each year in the United States, regardless of payer type. The hospital characteristics of ownership/control, bed size, teaching status, urban/rural location, and U.S. region are used to stratify the 8 million inpatient records to national estimates. Quantity of outpatient visits is provided by the American Hospital Association (AHA) Annual Survey. The quantity of outpatient visits is augmented by detailed diagnosis data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) and charge data from the Medicare and Medicaid Statistical Supplement. The revenue model of output is developed using annual hospital revenues from the Census Bureau Service Annual Survey (SAS) together with BLS Producer Price Indexes (PPIs).

We examine preliminary results of each model. The models show differing rates of positive long term growth in hospital output and hospital productivity over the period of 1993-2010. For a model to be broadly accepted the data must be highly accurate and the definition of output must be compelling. To that end, this paper examines the accuracy and robustness of the various data sources used in each model. Although the output of the hospital industry can be measured in a number of ways, we argue that the most natural way to define the output of an industry is to answer the question: what services are the consumers buying? For hospitals, we conclude that the consumer is purchasing the overall

course of treatment for a specific health problem, and therefore, counting overall courses of treatment is the preferred method of measuring output for private hospitals.