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Productivity measurement in Swedish departments of gynecology and obstetrics

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Abstract

The rapid growth of public spending and the need to assess its impact on the welfare system has made the studies of productivity in the public sector an important subject. This paper is concerned with the specification and estimation of total factor productivity growth using the primal panel data approach. The total factor productivity growth is decomposed into technical change and scale components. Several competing models are used to explore whether there are any similarities in the estimates of total factor productivity growth and technical change among these models. The models are estimated using different estimation methods. Some of the models, although assuming a Cobb–Douglas technology, exhibit firm-specific technical change. These models are used to measure productivity growth in departments of gynecology and obstetrics in Sweden. Empirical results show evidence of large and negative rate of productivity growth. In comparison among different specifications proposed, the level and the time pattern of productivity measures vary substantially across models and estimation methods. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

The tremendous growth of public spending and the need to assess its impact on the welfare system and fiscal management has made the studies of productivity in the public sector an important subject for policy-makers and economists. The Expert Group on Public Finance has published a number of reports on the measurements and development of productivity in the public sector in Sweden, covering the period 1960–1992. Large segments of the public sector producing individual services were included in these studies. Changes in the composition and quality of outputs were incorporated in the measurements. With the exception of a few areas quality was not changed enough to significantly affect the productivity measurements. The aggregate productivity change during the period 1970–1980 was calculated to be -1.5% per year. Other productivity studies with less coverage during 1960–1970 showed productivity decrease at a higher rate. The recent studies for the period 1980–1990 indicate a continued productivity decrease of 0.4% per year. The development has however been different for national and local governments. Unlike local governments, the national government budget constraint had a positive impact on the levels of productivity.[1]

From the beginning of the 1990s, the public sector, in general, and the health care sector in particular, have been allocated relatively less resources as a consequence of the economic recession in Sweden. Financial difficulties have arisen because of the continued increased demand for public sector outputs due to the growth in the number of children, the elderly, the unemployed, the handicaps, refugees, criminals, etc. The increased demand for services is expected to be satisfied by using the reduced resources available, especially staff members. Thus, increased productivity is regarded as a solution to the structural budget deficit problem of the government sector. The total cost of health care as a percentage of the per capita gross domestic product has decreased during 1990–1996. Despite the decline in the share of health care expenditures, there has been a desire to maintain a high capacity in terms of bed occupancy in hospitals and the provision of health care services with improved quality. The expected outcome of these changes is an improvement in resource utilization, primarily through the increased productivity of doctors and nurses, together with a higher bed occupancy rate.

The measurement of technical change and total factor productivity growth has for a long time been the focus of attention in empirical studies in agriculture and industry (see Antle and Capalbo, 1988; Jorgenson et al., 1987). Diewert (1981) classified the various measures of technical change into four groups: (i) econometric estimation of production and cost functions; (ii) Divisia indexes; (iii) exact index numbers; and (iv) non-parametric methods using linear programming.

In the econometric approach, technical change has generally been represented by a simple time trend. Estimates of rate of technical change are then calculated as the percentage change in production or cost over time. With the advent of flexible

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[1] For details on the development of productivity in various segments of the public sector, see Finansdepartementet (1986, 1994a,b).