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Economies of scale and scope in the provision of diagnostic techniques and therapeutic services in Portuguese hospitals

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Objectivos (Objectives):

Hospital efficiency has received over the years' widespread attention in the literature. Yet, little is known about cost structures of services within the hospital. We address here the analysis of auxiliary services that typically are present within the hospital. This paper estimates a flexible cost function for the three most important (cost-wise) diagnostic techniques and therapeutic services in Portuguese hospitals: Clinical Pathology, Medical Imaging and Physical Medicine and Rehabilitation.

Our objective in carrying out this estimation is the evaluation of economies of scale and scope in the provision of these services in Portuguese hospitals. These results have important policy implications. For instance, they allow us to assess the optimal hospital dimension for the provision of such services, as well as to understand whether the joint production of some services is more efficient than stand-alone production.

Metodologia (Methodology):

We use publicly available data from hospitals' analytical cost accounting published by IGIF for the years 2002-2006, in particular the total variable costs and total production of each output. In addition, we have also collected information regarding each individual hospital from the yearly National Health Service reports.

The estimation was carried out for a translog cost function, assuming that hospitals operated in the short-run, i.e. assuming that the quantity used of some factors of production could not be easily changed. This function includes all possible interactions between input prices, output levels and fixed factors. We have estimated the cost function jointly with the cost share equations in order to improve the quality of the estimation.

Resultados (Results):

For Clinical Pathology and Medical Imaging we find evidence of ray economies of scale, i.e. as we increase the quantity produced of each individual output, costs increase less than proportionally. We also find that there is some evidence of economies of scope for some of the services provided within each category, but not for all of them. This suggests that some services could be provided independently within each hospital without affecting overall costs. In the case of Clinical Pathology, we find that hospitals are under-dimensioned, i.e. they have too little medical equipment (which we proxy by using the number of beds) for

the output they produce. The reverse is true for Medical Imaging: hospitals appear to be over-dimensioned, i.e. they have too much hospital equipment for the output they produce.

For Physical Medicine and Rehabilitation, the short-run estimation of the translog cost function does not provide sensible results. We conjecture that this is because there may be no fixed factors of production in the provision of this type of service. Therefore, we estimate a long-run cost function and also find evidence of economies of scale and scope (although not for all individual outputs).

Conclusões (Conclusions):

We relate our results to the ongoing discussion of where and how should hospitals provide these services. In particular, the Portuguese National Health Service allows for hospitals to outsource the production of particular services to public or private contractors within its facilities. If there are economies of scale in the provision of a particular service, such a contractor could aggregate larger output levels and take advantage of such economies. Similarly, if no economies of scope are found in the production of an individual service, this suggests that that service could be provided independently within the hospital without affecting the overall cost level.