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Market and public provision in the presence of human capital externalities ☆

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Abstract

For many goods and services, such as health, education, legal services, police protection, the cost incurred by an individual supplier for providing quality is affected by the human capital of her colleagues. The paper shows that this human capital externality is crucial to determine whether such goods and services should be privately or publicly provided. Public and private provisions give individuals different incentives to acquire human capital, and the paper shows that either may be socially preferable, depending on the nature of the human capital externality: private provision of the final goods and services gives stronger incentives to human capital acquisition (and may therefore be socially preferable) if own human capital and one's colleagues' human capital are substitutes, and if suppliers with high human capital benefit more than suppliers with low human capital from their colleagues' human capital, but not excessively so.

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1. Introduction

The boundary between public and private provision of goods and services has moved radically in recent decades, which have witnessed a substantial decline of state provision, widespread privatisation programmes, and increasing private involvement in areas traditionally supplied primarily by the public sector, such as health, education, defence, policing and prison services. Shleifer (1998) surveys some of the literature which asks the normative question of which

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goods and services are best provided by the public sector and which by the private sector. In this vein, we aim here to establish a rigorous theoretical foundation to this question for services[1] with the following characteristics.

- The quality of the service is important, and human capital is an important component of quality.
- While users acquire the service from an organisation, the service itself is supplied by a specific and identifiable individual or a very small team.
- There are human capital externalities in the provision of the service: *ceteris paribus*, an individual supplier's cost of supplying the service depends on the characteristics of her colleagues.

Education, health, legal services, the administration of justice, national defence, policing, criminal investigations, prison services, most of music production, civil aviation and many others satisfy these characteristics. Quality is obviously very important for them, and it is heavily influenced by investment in human capital, which often requires years of full time training. The second property is also obvious: patients go to a hospital, but they are treated by a given physician; students attend schools and universities, but each class is taught by an individual teacher; when our house is burgled or our car stolen we call the police, and a specific officer carries out the investigation; we book a flight with an airline, and our plane is flown by a given crew; for legal advice we contact a law partnership, usually employing many lawyers, and our case is assigned to one individual or at most a small team; justice is administered by a large department, but each case is adjudicated by a small court, and so on: this is clearly fundamentally different from goods such as cars for which it is nigh impossible to attribute output to specific individuals. Finally, doctors working in a hospital, teachers in a school, soldiers in a regiment, officers in a police department, and of course professors in a university are all aware of the third bullet point above: the working environment matters enormously for the costs (monetary and non-monetary and net of benefits) of having a job, and the personal characteristics of one's colleagues affect overwhelmingly the working environment.[2] We assume that the quality of the service is observable and enforceable. Thus our paper is not in the recent strand of literature which views contract incompleteness as an important determinant of the costs and benefits of private and public provision (Hart et al., 1997). We aim to convince the reader that human capital externalities are a very plausible explanation, both in theory and in practice, for differences in private and public provision, alongside, and fully compatibly with, contract incompleteness.

In the model, the government chooses first how to intervene in the market, whether via direct public provision, or indirectly, taxing and subsidising the private market. Because our paper focuses on the technology of production, arguing that it is intrinsically different according to whether the service is supplied by profit maximising units or by units which are directly controlled by a government agency, we define public provision differently from the established literature, where public provision of a service means that it is funded by the public purse, though it may be provided by private agents (see for example Blomquist and Christiansen, 1999). In other words, in this paper, the crucial separation is between finance and provision: goods and services can be publicly financed and privately provided, as is the case in practice for many capital goods such as roads, schools, hospitals, barracks, weapons systems, social housing, and for services such as health and education which many users receive from private providers while their cost is borne by the public purse. Once they know the mode of provision, individual suppliers invest in human capital: they go to university, medical or law school, teacher training college and so on. They are subsequently employed by an organisation, where they supply their service, which is variable in quality. A supplier's cost of supplying quality depends on her own human capital and on the average human capital in her organisation.

Our main result is that *either private or public provision may be preferred by the government*, depending on the nature of the human capital externality. The crucial difference between the two modes of provision is that they determine *different incentives for the potential suppliers to acquire human capital*, and therefore the aggregate human

[1] We refer in the whole paper to "services" to avoid repeating the phrase "goods and services", and because most of the specific examples are indeed services. Of course the analysis applies just as well to physical goods with the three characteristics listed here.

[2] Some services satisfy some but not all of the three above characteristics; for example, in the arts, the quality of human capital is obviously very important, training is often substantial, but, with the exception of musical groups, from symphonic orchestras to string quartets and pop bands, provision is by individuals, not by organisations. Similarly, dentists, optometrists, and family doctors are often self-employed individuals, with little interaction with colleagues; in education, private tutors have existed long before schools, and in much fiction private sleuths are highly individualistic providers of criminal investigations. Banking and insurance services, in common with practically the whole of manufacturing, lack the characteristic in the second bullet point: while quality is important, and while there are human capital externalities, the personal identity of the supplier is either not known or irrelevant.