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# The treadmill effect in a fixed budget system<sup>☆</sup>

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## Abstract

We examine the interaction in the market for physician services when the total budget for reimbursement is fixed. Physicians obtain points for the services they render. At the end of the period the budget is divided by the sum of all points submitted, which determines the price per point. We show that this retrospective payment system involves – compared to a fee-for-service remuneration system – a severe coordination problem, which potentially leads to the “treadmill effect”. We argue that when market entry is possible, a budget can be efficiency enhancing, if in addition a price floor is used.  
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## 1. Introduction

Rising health care costs is high on the political agenda in nearly all western countries. To keep payments for physicians under control, one proposal is to fix the total expenditure for

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health care suppliers. Already in 1993 in the German physician market there was a switch from the cost reimbursement system to a remuneration system with a fixed budget to stop rising health care expenditures.<sup>1</sup>

Looking at the German outpatient market the following interesting observations can be made. Since the 1990s the average income of physicians has decreased substantially. Furthermore, since the introduction of the budget system, the reimbursement per treatment has fallen.<sup>2</sup>

In this paper we suggest one possible explanation for these observations, and argue how they may be related to each other. For this purpose we investigate the interaction in the market for physician service when the budget is fixed. By analyzing the strategic uncertainty of a single doctor we show that the market for physician service can – due to a coordination problem – be stuck in an equilibrium where physicians have to augment their number of treatments to avoid bankruptcy. As a consequence prices fall. Our analysis suggests that the introduction of a specific mechanism of a price floor into the market for physician services could solve this coordination problem.

Our model belongs to the field of research where alternative reimbursement schemes are investigated and compared.<sup>3</sup> Many theoretical papers consider physician response to the form of reimbursement rule, generally focusing on fee-for-service versus capitation reimbursement.<sup>4</sup> Consequently, many of the empirical papers have examined the effects of exogenous changes in physician remuneration programs.<sup>5</sup> However, strategic aspects (in our case induced through a fixed budget) have not been investigated so far.<sup>6</sup>

We compare the remuneration system of fee-for-service, which we call price system, with the retrospective payment system of a fixed total budget, which we call point-system. In this payment system the individual physician receives a certain number of points per treatment which depends on the kind of service he renders. At the end of each quarter the fixed budget for all physicians is divided by the sum of points submitted by all physicians

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<sup>1</sup> Some other countries have also gathered experience with total budgets. Fixed budget systems for example are used in the physician remuneration system of France, the United Kingdom and are also partially used in the U.S.A., i.e. in the Medicare services. Although the federal government in the United States has proposed the option of a fixed budget within the Clinton health plan, global budgets have been introduced only within a small percentage in the health industry in the U.S.A. In Canada since 1990 payment for physician services in the fee-for-service sector has shifted from an open-ended system to fixed global budgets (Hurley and Card, 1996).

<sup>2</sup> See Section 2.

<sup>3</sup> For an overview see Gaynor (1994), who summarizes industrial organizational aspects in the market for physician services.

<sup>4</sup> See Newhouse (1992), Ellis and McGuire (1993) and McGuire (2000) for reviews.

<sup>5</sup> For summaries see Rice and Labelle (1989), Dranove and Wehner (1994) and Scott and Hall (1995).

<sup>6</sup> Exemptions are Mougeot and Naegelen (2005) and Fan et al. (1998). Mougeot and Naegelen analyse the consequences of a fixed budget for the hospital market. Hospital managers can choose quality and cost reducing effort. It is shown that when the number of hospitals becomes large, a budget cap can achieve the second best outcome. Fan et al. concentrate on the physician market under an expenditure cap, where physicians compete in quantities. They show and test experimentally that under a budget cap physicians will always increase the quantity provided. In contrast, we show that by including effort and bankruptcy costs (cf. Assumption 1) this outcome is not an inevitable consequence of a fixed budget.

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