

## **COUPLED VS. DECOUPLED SUBSIDIES WITH HETEROGENEOUS FIRMS IN GENERAL EQUILIBRIUM**

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We develop a competitive general equilibrium model with heterogeneous firms and endogenous entry and exit to contrast the effects of coupled and decoupled subsidies. Unlike coupled subsidies, decoupled subsidies are not tied to a producer's level of output, so they are thought to be less distortive. We challenge this view by proving that, in a model with endogenous TFP, coupled subsidies have no effect on TFP while decoupled subsidies have a negative effect. Moreover, our numerical experiments show that, for a given level of government expenditure, decoupled subsidies can lower welfare more than coupled subsidies.

*JEL classification codes:* O4, L0, L2, L5

*Key words:* policy distortions, firm heterogeneity, productivity

### **I. Introduction**

The allocation of resources across firms is a key factor in understanding total factor productivity (TFP). Given the importance of TFP in accounting for macroeconomic fluctuations, it is crucial to understand how government policies affect this residual (see, for example, Kehoe and Prescott 2007). Government subsidies to producers may lower TFP by propping up low-productivity establishments that would otherwise exit. The objective of this study is to contrast the effects of two broad types of

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government subsidies to firms. *Coupled subsidies* are tied to the level of output, such as price supports. *Decoupled subsidies* are independent of the level of output, such as direct payments to producers. We are particularly concerned with how these subsidies affect firm entry and exit, aggregate TFP, and social welfare. It is commonly thought that decoupled subsidies are less distortive. For example, in a model with a representative firm, decoupled subsidies that are financed by lump-sum taxes are entirely non-distortionary. We instead consider a model in which heterogeneous firms make endogenous entry and exit decisions. In this setting, we prove that decoupled subsidies negatively affect TFP, while coupled subsidies do not. We also show that, contrary to conventional wisdom, decoupled subsidies can cause larger welfare losses than coupled subsidies for a given level of government expenditure.

To contrast the effects of these subsidies, we take a static one-sector model and incorporate the competitive industrial organization theory of Hopenhayn (1992), but in a general equilibrium setting, as in Hopenhayn and Rogerson (1993) (though their application is employment distortions). In the model, firms make endogenous entry, operating, and exit decisions. After paying a fixed cost of entry, a firm draws its productivity from a continuous probability distribution. Each firm can operate a technology with decreasing returns to scale, but there is a fixed cost of operating, so low-productivity firms may choose to exit rather than operate. This creates an endogenous productivity cutoff for operating, which in turn makes aggregate TFP endogenous in the model. The model also has a representative consumer that makes a labor-leisure decision and a government that offers subsidies to firms and finances them through a lump-sum tax on the consumer. (We do not incorporate distortionary taxes so as to isolate the distortionary effects of the subsidies.) We model the coupled subsidy as a flat-rate output subsidy and the decoupled subsidy as a lump-sum operating subsidy.

We conduct both qualitative and quantitative analysis of the policies. A crucial difference between the two subsidies is in their effect on TFP. We prove that the lump-sum operating subsidy lowers TFP, while the output subsidy has no effect on TFP. In general equilibrium, the output subsidy raises the wage so as to leave firms' profits, and therefore the productivity cutoff for operating, unchanged. Other effects of the two types of subsidies are qualitatively the same, so we turn to quantitative policy experiments. In order to directly compare the policies, we consider coupled and decoupled policy pairs such that the level of government expenditure on each subsidy is the same. Using standard functional forms and parameter values, we show that decoupled subsidies lead to larger welfare losses than coupled subsidies.

The policy debate over coupled vs. decoupled subsidies is particularly prominent in the agricultural sector, which is a heavily subsidized sector in many countries.

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