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Payments systems and monetary policy[☆]

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Abstract

A dynamic spatial model is constructed where there is a role for money and for centralized payments arrangements, and where there are aggregate fluctuations driven by fluctuations in aggregate productivity. With decentralized monetary exchange and no centralized payments arrangements, there is price level indeterminacy, and the equilibrium allocation is inefficient. A private clearinghouse arrangement improves efficiency but produces a real indeterminacy. The pricing of daylight overdrafts is irrelevant for the equilibrium allocation. Efficiency is achieved with a zero nominal interest rate on overnight central bank lending, or through private overnight interbank lending.

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1. Introduction

The objective of this paper is to study the role of the central bank in a model which permits alternative types of payment arrangements. In the model there is a role for monetary exchange, and for centralized credit, and there are deterministic fluctuations in aggregate output, consumption, and employment, driven by fluctuations in aggregate productivity. The interaction between private payments arrangements and central bank credit is shown to have important implications for

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the variability of relative prices, the price level, consumption, output, and employment.

Economists have long been interested in the implications of private intermediation arrangements for monetary policy. [Friedman \(1960\)](#) argued that there should be a separation of money from credit, imposed through a 100% reserve requirement on intermediary liabilities which serve as a medium of exchange. He viewed fluctuations in the aggregate quantity of media of exchange and the price level as detrimental, and the 100% reserve requirement would improve monetary control by insulating the money stock from shocks to the quantity of credit. However, [Sargent and Wallace \(1982\)](#) countered that endogenous variability in the stock of media of exchange and the price level could be consistent with Pareto optimality, and inhibiting the creation of private media of exchange through legal restrictions on private intermediation would in general result in inefficiency. In the Sargent–Wallace model, Pareto optimality is achieved either through unrestricted private intermediation, or with restricted intermediation and unrestricted central bank credit. [Champ et al. \(1996\)](#) extended the Sargent and Wallace model to an environment with [Diamond and Dybvig \(1983\)](#) banks and circulating media of exchange. They showed that legal restrictions on private intermediation, in addition to implying inefficiency, could create banking panics, in a manner consistent with empirical evidence from the U.S. National Banking era and the same period in Canadian banking history.

In part, the problems with the restrictions on financial intermediation suggested by Milton Friedman follow from the inefficiencies associated with distorted markets that would operate efficiently in the absence of these restrictions. Also, there is a tension between Friedman's ideas in [Friedman \(1960, 1969\)](#), where he argues for the optimality of a monetary rule, the “Friedman rule”, which drives the nominal interest rate to zero in all states of the world. In stochastic environments, or environments with deterministic fluctuations, the Friedman rule will be achieved, in general, when the money supply fluctuates over time, albeit in a systematic fashion. In contrast, in [Friedman \(1960\)](#) the premise is that fluctuations in the money supply are suboptimal.

A significant quantity of recent research has focussed on the design and functioning of payments systems. The payments system is the network of private and public intermediation arrangements through which transactions take place. It can be taken to include payments intermediated by government-supplied currency, payments by check cleared through private or central bank clearing facilities, electronic interbank payments cleared through the central bank or private intermediaries, and payments using electronic cash. Some research on payments examines issues related to the pricing of credit in payments systems, incentives, and risk sharing ([Fujiki et al., 1997](#); [Rochet and Tirole, 1996a, b](#)), while other work looks at the general equilibrium implications of payments system arrangements ([Freeman, 1996a, b](#); [Lacker, 1997](#); [Kahn and Roberds, 1998](#); [Williamson, 1998](#); [Temzelides and Williamson, 2001](#)).

Payments system research is novel in monetary economics, in that it deals with the interaction between decentralized media of exchange (fiat money) and centralized payments arrangements. However, there are many issues associated with payments

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