# Trading horizons and the value of money

Gabriele Camera[a],[*], Filip Vesely[b]

[a]*Purdue University, USA*
[b]*University of Wisconsin-Milwaukee, USA*

## Abstract

This paper shows that fiat money can be feasible and essential even if the trading horizon is finite and deterministic. The result hinges on two features of our model. First, individual actions can affect the future availability of productive resources. So, agents may be willing to sell for money, even if on that date they have no reason to accept it. This makes monetary trade feasible in all preceding dates. Second, agents are anonymous and direct their search for partners. So, gift-giving arrangements may be prevented because agents can misrepresent their consumption needs. This makes money essential in exploiting any gains from specialization and trade.
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## 1. Introduction

A basic idea in economics is that allocations can be improved by specialization and trade and can be further expanded by innovations in the trading technology. Fiat money is such an innovation. Indeed, several observers have indicated that the use of "barren" tokens facilitates beneficial trades in markets that are subject to a variety of frictions (e.g., see Ostroy and Starr, 1990).

Interestingly, virtually all fiat monetary models consider infinite trading sequences. The reason is that for intrinsically useless tokens to have value in equilibrium, agents must

[*]Corresponding author. Tel.: +1 765 494 4456.
  *E-mail address:* gcamera@mgmt.purdue.edu (G. Camera).

expect that someone will want to trade consumption for money at some future date (Cass and Shell, 1980). One may thus infer that money necessarily loses its beneficial role in environments where the trade sequence is finite and deterministic (e.g., see Kocherlakota, 1998, p. 244). In this study we explain why this would be a rushed conclusion, by using a model in which the actions of a single agent can reduce aggregate productive capacity.

The economy is populated by finitely many dynastic (altruistic) agents from two overlapping generations. The initial old have one token each, the young are productive and society can benefit from specialization and trade. This simply means that the young should produce a high-value good for the old, avoiding other alternatives. We add a reason to worry about consumption of the old, relative to the usual (e.g., Antinolfi et al., 2001), by letting a dynasty's survival depend on the old's consumption. Hence, the current allocation of output can affect the future availability of productive resources and there is a consumption externality. Another main feature is that matching is endogenous, i.e., agents can direct their search in order to meet a trading partner of their liking. Finally, the model displays a set of frictions that preclude history-dependent credit trades and give money a central role. The dynastic formulation naturally motivates the existence of difficulties in maintaining long-term relationships and in conditioning current actions on observation of past play. We also assume anonymity and limited communication/commitment; only money holdings of an individual are observable, but not his identity and characteristics, trades are unobservable to third parties, and agents can choose autarky at any point in time. These frictions are common in the "foundations of money" literature.

A key departure from the typical monetary model, besides consumption externalities, is that the trading sequence is finite. Specifically, we impose a publicly known and deterministic end on the economy's life. For this environment, we prove that multiple Pareto-ranked equilibria are possible, and in some of these equilibria high-value trades take place only if they are supported by the exchange of tokens. In these outcomes, monetary transactions occur until a date sufficiently ahead of the economy's end and, above all, tokens are exchanged in trade because their use allows society to avoid an inferior equilibrium. That is to say, we demonstrate that, for certain parameters, fiat monetary exchange is not only *feasible* when the horizon is finite, but it is also *essential* (e.g., Huggett and Krasa, 1996; Kocherlakota, 1998). What generates this result?

Clearly, monetary exchange is feasible with infinite horizons, since it is always possible to trade in the future any money that is accepted today. In contrast, with a finite horizon, the feasibility of monetary exchange rests on the assumption that individual actions are strategically non-negligible and have permanent aggregate consequences. This implies that, on money's last trading date, making unilateral transfers to the old is necessary to preserve the stock of productive resources. So, agents may be willing to produce for someone who holds money, even if on that date they have no reason to accept it. Incentives to do so exist when the population is small enough, which is when the future benefit from high productive capacity offsets the current production disutility, i.e., consumption externalities are sufficiently large. This makes monetary trade feasible in all preceding dates, by backward induction.

The essentiality of monetary exchange, instead, is due to anonymity and endogenous matching. These features make "gift-giving" trading arrangements unsustainable in large economies because in such settings consumption externalities are small. So, the young would want to direct their search in a socially undesirable manner, misrepresenting their consumption needs. That is, they would attempt to consume, instead of producing, by