

# Some observations on the notion of liquidity (Extended Abstract)

Gaetano Antinolfi

Washington University at Saint Louis

Enrique Kawamura

Universidad de San Andrés

February 15, 2010

Recent events have once again brought attention to the importance of liquid financial markets. Though everybody agrees that liquidity is important, the term is used to indicate several economic phenomena, and the definition of liquidity is usually not given precisely<sup>1</sup>. Sometimes it is the property of an asset, like in "a house is less liquid than government bonds because it takes longer to sell it at a good price;" sometimes it is referred to as the property of an individual, like "government bonds are more liquid than private bonds because the government is a more reliable borrower;" sometimes the term is used in reference to a market, like in "thick markets are more liquid than thin markets." Another notion simply defines liquidity as the medium of exchange. It is actually this definition that is probably most directly linked to economic policy. The definition of liquidity as the medium of exchange can be found first, to our knowledge, in a presidential address that Hicks gave to the Royal Economic Society, subsequently published in the *Economic Journal* (see Hicks 1962). Hicks attributes the modern use of the word liquidity to Keynes and identifies it with the Keynesian notion of liquidity preference. In this context, liquidity is identified with money and, the liquidity preference is the demand for the safe asset in a portfolio of otherwise risky assets.

This paper aims to study how the different notions of liquidity outlined above interact with each other and relate to monetary policy. This paper develops a model where money has an identifiable role as a medium of exchange, and draws its value from this property. The basic structure of our model is based from Lagos and Wright (2005). Time is discrete, indexed by  $t = 0, 1, \dots$  and continues forever. There is continuum of infinitely-lived agents whose names are in the interval  $[0, 1]$ , all born in period 0. There are two types of consumption goods in the economy. The first is the numeraire good, traded in a Walrasian centralized market (CM). The second is a continuum of goods that are traded only at decentralized markets (DM). Each period is divided into two subperiods, the first one being the DM sub-period. The CM numeraire good is obtained from two sources. The first is production: consumers spend some time to work to produce these goods. This technology is linear with unit productivity. The second source is a productive asset called a "tree", which is in fixed supply  $A$ . This tree produces at the beginning of the CM of period  $t$  a random amount  $\delta_t$  of dividends, received right before the CM opens in each period.

---

<sup>1</sup>For a more comprehensive discussion on different liquidity notions, see section 3 in Fostel and Geanakoplos (2008).

Each consumer produces a good in the DM. The good is not part of the individual's consumption set, and has to be exchanged. The production technology, again, is linear with unit productivity. This friction is what gives rise to fiat money as a medium of exchange. In this particular example, money and trees are both usable, at least in principle, as a medium of exchange, but they possess different "liquidity." This model assumes (at least in some versions of the economy) that the probability of a bilateral meeting,  $\lambda_t$ , is also ex-ante random, that is to say, there is aggregate uncertainty on the fraction of absence of double coincidence of wants. As in Lester et al. (2009), the model assumes that in the DM sub-period there is asymmetric information on the consumers' side regarding the payoff of the tree (the real asset). In particular, each consumer must invest an amount of the numeraire good to learn the true realization of  $\delta_t$ , which is assumed to be a random variable as in Lagos (2009). Each consumer  $j \in [0, 1]$  pay a cost  $\kappa(j, \xi_t)$  whose value depends on the realization of the random variable  $\xi_t$ . This determines the fraction of the population that becomes informed in period  $t$ , denoted as  $\rho_t$ . Essentially, this model modifies the environment in Lester et al. (2009) by adding shocks on the cost of becoming informed. These shocks can be interpreted as changes in "uncertainty" that may be triggered by extreme events such as political or financial crises, natural disasters, or other shocks of this same sort.

The reason for this modification is to explore whether monetary policy alone can achieve Pareto-efficiency and what role is there for fiscal policy under certain assumptions regarding the probability distribution of such shocks. To do this, the model introduces a policy maker that can be rationalized as the joint work of a central bank and the treasury, which constitutes the main extension of this paper relative to Lester et al. (2009). This policy maker determines the growth rate of the money supply and a tax on dividends received by consumers. The model proposes to consider different assumptions regarding what the policy maker can observe in each period. The decisions of the policy maker will allow a qualification of the different notions of liquidity and the extent to which monetary and fiscal policy can neutralize or counteract problems related to lack of liquidity.

## References

- [1] Fostel, Ana and John Geanakoplos (2008). "Collateral restrictions and liquidity under-supply: a simple model." *Economic Theory* **35**, pp. 441-67.
- [2] Hicks, John (1962). "Liquidity." *The Economic Journal* **72**, pp. 787-802
- [3] Lagos, Ricardo (2009). "Asset Prices, Liquidity, and Monetary Policy in an Exchange Economy." Working Paper.
- [4] Lagos, Ricardo and Randall Wright (2005). "A Unified Framework for Monetary Theory and Policy Analysis." *Journal of Political Economy* **113**, pp. 463—484.
- [5] Lester, Benjamin, Andrew Postlewaite and Randall Wright (2009). "Information, Liquidity, Asset Prices and Monetary Policy." Working Paper.