Network Effects and Hayek’s Proposal for Competing Monies

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Abstract:
Given the renewed interest in alternative monetary systems, it is conceivable that some may reconsider Hayek’s proposal for competing monies. I attempt to show that Hayek underestimates the importance of network effects. As a result, his confidence in believing the mere admission of competing private currencies will spontaneously generate a more stable monetary system is unfounded. After reviewing Hayek’s proposal and detailing the historical significance of network effects, I draw on the modern theoretical literature concerning currency acceptance to offer a general solution for entrepreneurs attempting to provide the type of monies Hayek recommends.

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“We have always had bad money because private enterprise was not permitted to give us a better one.” Hayek (1990, p. 131)

1. Introduction

Many economists were surprised in November 2010 when World Bank President Robert Zoellick recommended G20 leaders consider adopting a modified global gold standard. Although monetary policy has been fiercely debated since the Bretton Woods system collapsed in 1971, rarely has the conversation turned to consider alternative monetary systems. Zoellick’s (2010) proposal, where gold is employed “as an international reference point of market expectations about inflation, deflation and future currency values,” is quite distinct from the classical gold standard. Even still, it suggests respectable economists might once again engage in debates on the merits of alternative monetary systems.1

In the mid-1970s, just two years after being awarded the Nobel Prize, F. A. Hayek offered a novel alternative to the unconstrained central banking systems that prevailed in most developed nations.2 Hayek proposed private banks be permitted to offer unique un-backed currencies. A system of competing monies, according to Hayek (1990, p. 130), would prevent “bouts of acute inflation and deflation” and “recurrent waves of depression and unemployment.”3 Furthermore, he argued, it would provide the necessary constraint to accomplish these tasks without the resource and redemption costs of the classical gold standard (p. 110).4 But few were persuaded by Hayek’s argument.

Given the renewed interest in alternative monetary systems, it is conceivable that some may reconsider Hayek’s proposal for competing monies. I attempt to show that Hayek underestimates the importance of network effects. As a result, his confidence in believing the mere admission of competing private currencies will spontaneously generate a more stable monetary system is unfounded. After reviewing Hayek’s proposal and detailing the historical significance of network effects, I draw on the modern theoretical literature concerning currency acceptance to offer a general solution for entrepreneurs attempting to provide the type of monies Hayek recommends. Whether entrepreneurs are capable of overcoming network effects in

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1 Zoellick (2010), for example, describes his proposal as “practical and feasible, not radical.”
2 Although Hayek’s proposal was temporally preceded by Klein (1974), the authors presumably reached their positions independently. See: Hayek (1990, p. 27, fn. 1).
4 Regarding the superiority of his proposal, Hayek (1990, p. 48) provides a clear statement: “Competition would certainly prove a more effective constraint, forcing the issuing institutions to keep the value of their currency constant (in terms of a stated collection of commodities), than would an obligation to redeem the currency in those commodities (or in gold). And it would be an infinitely cheaper method than the accumulation and the storing of valuable materials.”
practice and, if so, whether the resulting system is more stable as Hayek suggests are important topics in need of further consideration, but rest beyond the scope of this paper.

2. Hayek’s Proposal

Inflationary pains prompted much discussion in the 1970s, much of which concerned the merits of returning to the classical gold standard. The novel approach advocated by Hayek was to allow concurrent, competitively issued currencies. Hayek’s system of competitive note issue differed from Free Banking (an alternative supported by Hayek’s student, Vera Smith) in that note issuers were not contractually obligated to redeem their notes for some underlying commodity. Rather, notes would trade against each other (and against commodities) on the open market.

How would private issuers behave under Hayek’s proposal? “The chief attraction the issuer of a competitive currency has to offer to his customers,” Hayek (1990, p. 59) reasons, “is the assurance that its value will be kept stable (or otherwise made to behave in a predictable manner).” In other words, note issuers expand and contract the amount of their notes in circulation in an effort to keep the value of their notes equal to a unique, predetermined basket of commodities. All note issuers need not target the same basket under Hayek’s proposal. In fact, he is largely agnostic concerning the composition of the baskets to be targeted. In the long run, market competition would presumably determine which baskets were best suited to serve as targets.

Without direct redemption and clearinghouse mechanisms that deplete the gold reserves of banks issuing notes in excess of what their customers wish to hold (as is the case under Free Banking), Hayek’s system requires that note holders be sensitive to the purchasing power of

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5 Hayek (1978, p. 110) details the state of the debate in the late 1970s as follows: “Most people therefore now believe that relief can come only from returning to a metallic (or other commodity) standard.”

6 In addressing Hayek’s proposal, I refer exclusively to the third (and final) edition of Denationalisation of Money. This edition presumably benefited from feedback on earlier editions (indeed, the title was amended to clarify that the argument had been refined) and, as such, might be viewed as Hayek’s final statement on the topic.


8 As Hayek (1990, pp. 73-4) is fully aware, it is not immediately obvious that purchasing power considerations will dominate. Many of the benefits of a stable purchasing power (e.g., stable business cycle) depend not merely on the currency chosen by the individual but rather on the currencies held by the group. This disjunction between choice and consequences leaves open the theoretical possibility that individuals choose a currency in their own interest even though everyone would be better off if an alternative currency prevailed. Nonetheless, Hayek (p. 74) maintains that individuals will prefer monies with a stable value in order to “minimise the effects of the unavoidable uncertainty about price movements.”

9 Hayek (1990, p. 46-7) leaves open the possibility that the targeted basket be amended from time to time.

10 Hayek (1990, p. 74-6) expresses doubts that a basket of consumption goods will be chosen, and similarly expresses hope that a basket or baskets of raw materials emerges as the standard target(s). This, however, is the extent to which he specifies the optimal composition of commodity baskets.
money. He suggests that newspapers would regularly publish statistics on the purchasing power of the various monetary units in terms of the basket targeted by the issuer, but perhaps also relative to the newspaper’s own preferred basket (Hayek 1990, pp. 53-4). Issuers who fail to stabilize the value of their notes quickly lose market share, as their notes are sold at lower and lower prices and they are forced to sell assets to contract the supply of notes outstanding. In the aggregate, Hayek contends, the decentralized targeting of multiple commodity baskets more effectively achieves stability in the general price-level than would a central bank, and at a lower cost than alternative systems.

In emphasizing the significance of stability in the individual’s calculus—prerequisite for a system of concurrent issues to function as desired—Hayek necessarily downplays the importance of network effects. As Hayek makes clear, “different kinds of money can differ from one another in two distinct although not wholly unrelated dimensions: acceptability (or liquidity) and the expected behavior (stability or variability) of its value” (p. 57). Hence, the degree of acceptability for a particular currency—or the size of its network—could potentially have a meaningful effect on demand for that currency. Hayek attests to the theoretical possibility that “liquidity may sometimes be more important than stability” (p. 58). However, he suggests that such occurrences are rare and only result in the short run: stability may not be the only consideration, but Hayek maintains it is the “decisive factor” (p. 59).

There are at least two potential reasons why Hayek concluded that network effects for money were insignificant. First, network effects were not well appreciated by economists in general when Hayek initially proposed his alternative monetary system. Indeed, the theoretical literature on network effects was just getting off the ground when Hayek published the third and final edition of his proposal. Second, he genuinely believed that the role of money as a unit of account dominated its other functions, making stability the most important characteristic. Hayek (1990, p. 67) expresses this view quite clearly:

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11 In a Free Banking system, individuals need not be primarily concerned with the purchasing power of the notes they hold because the notes of reputable banks trade at par against the gold coins to which they are claims, and the purchasing power of gold has historically been slow to vary. An over issue is quickly corrected as individuals deposit notes in excess to that which they wish to hold (under the assumption that purchasing power is unchanged). In redeeming these notes through the clearinhouse, other banks deplete the reserves of the overissuing bank, thus bringing about a correction before prices—and, hence purchasing power—are forced to adjust. The presence of this mechanism reinforces the expectation of a stable purchasing power.

12 If Hayek were writing today, he would probably rely on the internet to disseminate this information promptly.

13 White (1999a, p. 117) notes that Hayek’s defense of a system of competitive issues on the grounds that it would “more effectively achieve price-level stability” represents a clear departure from the view espoused by Hayek in earlier works, where price-level stability was rejected in favor of stabilizing M (e.g., Hayek 1928, 1929) or MV (e.g., Hayek 1935, 1937). See also: Hayek (1990, p. 87)

Although at first different attributes of money may seem desirable for its different uses, money renders one service, namely that as a unit of account, which makes stability of value the most desirable of all. Although at first convenience in daily purchases might be thought decisive in the selection, I believe it would prove that suitability as a unit of account would rule the roost.

These two facts certainly help make Hayek’s position understandable. But, as will be argued in the next section, the historical record suggests network effects are more important than Hayek realized.

3. The Historical Significance of Network Effects

Hayek (1990, p. 85) cites historical episodes of dollarization as support for his view that individuals are sensitive to changes in purchasing power when alternatives are present.15 Americans may be fortunate in never having experienced a time when everybody in their country regarded some national currency other than their own as safer. But on the European Continent there were many occasions in which, if people had only been permitted, they would have used dollars rather than their national currencies. They did in fact do so to a much larger extent than was legally permitted, and the most severe penalties had to be threatened to prevent this habit from spreading rapidly—witness the billions of unaccounted-for dollar notes undoubtedly held in private hands all over the world.

However, as Hayek rightly concedes, this evidence is insufficient.

That historical episodes exist where individuals spontaneously switch to a superior monetary standard is insufficient evidence for Hayek’s proposal because it does not address the relevant range over which such switching must occur. There is virtually no dispute that sufficiently large changes in purchasing power can induce individuals to switch to an alternative medium of exchange. Historical experiences of unofficial dollarization in hyperinflation countries make this clear. For competitive issues to bring about a greater degree of stability than that which prevails under most modern fiat regimes, however, individuals would have to switch from those fiat monies currently prevailing to the more stable private alternatives Hayek suggests would be put forward if permitted. This requires that individuals be sensitive to significantly smaller changes in the purchasing power. Unfortunately, Hayek does not provide evidence that his mechanism operates similarly over this range.

The severity of the historical episodes where spontaneous switching has occurred—or, more precisely, the fact that switching has not occurred historically for less severe deviations in purchasing power—suggests that some friction causes individuals to prefer the prevailing standard despite its obvious inferiority in terms of purchasing power stability to an available

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alternative. For Hayek (1990, p. 85), the friction results from legal restrictions: “if people had only been permitted, they would have used dollars rather than their national currencies.” A more recent experience defies this prediction, however, suggesting that something other than (though perhaps in addition to) legal restrictions dissuades individuals from spontaneously switching.

The case of Somalia following state collapse suggests that there is some reluctance to switch even in the absence of legal restrictions. In 1986, rebel groups joined and took arms against the ruling government. As is common throughout history in periods of conflict, the reigning Barre regime turned to the printing press as a means of financing its counterrevolutionary efforts. In total, the monetary base increased from 3,787 billion Somali shillings in 1985 to 155,738 billion in 1990 (Mubarak 2003, p. 314). When the government was finally ousted in 1991, a 1000 Somali shillings note was worth less than $0.13; the same note had exchanged for roughly $0.29 a year earlier.

The fall of the Barre regime marks the beginning of stateless Somalia. Nonetheless, its period of monetary instability would continue for some time. The Somali Revolution and subsequent fighting between rebel factions resulted in the collapse of the Somali banking system. Inside money disappeared, reducing total nominal balances from 336,424 to 155,738 Somali shillings (Mubarak 2003, p. 313). Furthermore, without a central bank to maintain the notes in circulation, the exchange media quickly became worn—and, in some cases, notes were too fragile to be accepted (p. 316-17). Despite the absence of a legal authority to prevent switching, and in the face of large deviations in the purchasing power and a diminishing quality of notes, individuals continued to use the un-backed paper Somali shillings.

By 1996, the difference between the purchasing power and cost of producing Somali shillings notes had been recognized, prompting widespread counterfeiting. Once again the Somali shilling was subject to a large reduction in purchasing power. The value of a 1000 Somali

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16 Similarly, Schuler (2001, p. 454) notes that state-chartered banks have been free to print their own notes in the US since 1976, and federally-chartered banks have been free to do so since 1994. Admittedly, a host of explicit and implicit legal restrictions remain. Still, one must recognize that a system of competitive issue has not yet developed.

17 These figures are open market rates as presented by Mubarak (2003, p. 314). Official IMF rates are not available immediately following state collapse.

18 Since 1991, the Polity IV project has consistently classified Somalia as “interregnum,” i.e., between sovereigns (Marshall and Jaggers 2009). Luther and White (2010) present a more qualified account, detailing the pockets of government existing at times over the period. Even accepting these occasions, distinct periods without sovereign support remain, supporting the argument presented herein.

19 Although foreign currencies had begun to circulate in the area as inflation picked up under the Barre regime, their use before and after state collapse was primarily for large transactions where use of low-valued Somali shillings notes was cumbersome. Somali shillings notes remain the primary medium of exchange for small businesses, market traders, and the poorer sections of the community (Symes 2006, p. 26).

20 Mohammed Farah Aideed ordered roughly 165 billion Somali shillings in 1996 from the British American Banknote Company based in Ottawa, Canada. Another 60 billion Somali shillings were imported by Mogadishu businessmen in 2001. In total, an estimated 481 billion in unofficial Somali shilling notes have been printed since 1991 (Symes 2006, p. 29).
shillings note fell from roughly $0.13 in 1997 to $0.04 in 2002. And although no legal authority existed to prevent individuals from switching to an alternative currency, the Somali shilling continued to circulate.

How might one account for the case of Somalia? As I have argued elsewhere (Luther and White 2010, p. 21), the most plausible explanation for the continued acceptance of the Somali shilling concerns the beliefs of Somalis and the network nature of money. The situation in Somalia might be characterized by a large-scale coordination game. Network effects imply that the payoff associated with a particular medium of exchange is increasing in the number of players coordinating on that particular monetary unit. In such a game, Somalis typically trading with other Somalis have no obvious way of coordinating on a commodity or foreign currency. In contrast, all Somalis have prior experience accepting the Somali shilling. As a result, Somalis continue to believe, at least provisionally, that other Somalis will accept Somali shillings in exchange and, by continuing to accept the notes themselves, reinforce this belief in others. This result is only strengthened by the facts that individual decisions are not made simultaneously and all individuals begin the game accepting Somali shillings.

Recognizing the historical significance of network effects in sustaining the prevailing medium of exchange does not imply that one must give up on the possibility of achieving a system of sound money in general or Hayek’s proposal in particular. After all, entrepreneurs deal with network effects every day. It is merely to acknowledge that a superior monetary system is unlikely to come about spontaneously in the way that money emerged from barter. Switching to an alternative monetary system once one has already been established—except in those cases where the prevailing system is sufficiently inferior—requires conscious action in order to overcome network effects favoring the status quo.

4. Overcoming Network Effects to Establish a Monetary Alternative

In the modern era, the role of providing currency has almost exclusively been assumed by the state. As a result, the theoretical literature concerned with determining the medium of exchange focuses on the necessary characteristics of the government attempting to accomplish this task. Fortunately, at least for our purposes here, the symmetry of government and non-government agents in the models discussed below allow one to draw conclusions for any group of

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21 Indeed, all Somalis know that all Somalis share this experience; and that all Somalis know that all Somalis know that all Somalis share this experience… Hence, it is only reasonable that they would attempt to leverage their common knowledge in coordinating on a monetary unit.
23 Menger (1892) provides the classic account of money emerging from barter. See also: Selgin and White (1987).
24 Selgin (1994, 2003) considers the potential and historical record of launching fiat monies when network effects are present.
individuals acting in concert, irrespective of the legal standing of the particular organization to which those individuals belong. Furthermore, the conclusions arising from these models are subject to an alternative interpretation whereby entrepreneurs effectively satisfy the necessary condition to determine the medium of exchange.

Aiyagari and Wallace (1997) and Li and Wright (1998) employ a search-theoretic random matching model to consider the characteristics of government necessary to determine the medium of exchange. Classifying a subset of the population as government agents, the authors then automate the strategies of these players so that they act in concert to accomplish a given social objective. As in earlier studies, the other individuals acting in the model space are left to determine their optimal strategies. Both Aiyagari and Wallace (1997) and Li and Wright (1998) conclude that a sufficiently big government is capable of determining the medium of exchange.

It is quite easy to extend these models to consider privately issued monies. In the models described above, government is merely a group of individuals acting in concert. An analytically equivalent approach would be used to consider firms, whose members contractually commit to pursue the objective of the organization. The firm could determine the medium of exchanged used by its employs by paying wages in a particular currency and accepting that currency in exchange for goods and services at the company store. And, if the firm were sufficiently big, others outside the firm would find it beneficial to accept these notes as well. Historical experience in company towns, where the mill or mine issued scrip that eventually circulated well beyond its own transactions and the transactions of its members, is consistent with this view.

The underlying logic of the two cases presented above is rather straightforward. Individuals are unwilling to accept a particular money if they suspect they will be unable to use it in obtaining the goods and services they ultimately desire. There is a network effect: individuals will join the network if and only if that network is of sufficient size. Governments, private companies, and other clearly demarcated organizations might overcome the network problem and establish a particular money if they are involved in a significant number of transactions. But it is also at least conceivable that entrepreneurs could satisfy the necessary condition by building networks of otherwise unorganized individuals.

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26 “How big is sufficiently big,” Li and Wright (1998, p. 312) explain, “depends on several factors, including properties of the money, the presence of alternative means of payment, and other aspects of policy.” Aiyagari and Wallace (1997, p. 11) even suggest “historical instances in which a government failed to determine what the public used in its transactions” might have occurred because “the government was not large enough.”
Note that overcoming the network effect in this sense implies merely that a new currency is successfully launched. It does not imply that individuals who adopt the new currency are then sensitive to changes in its value. Alternative monies would similarly (and simultaneously) have to overcome network effects if the degree of sensitivity required for Hayek’s system to work as intended is to be obtained. Standardization in a unit of account divorced from competing media of exchange perhaps provides a solution to this problem. Although such a scenario is plausible, it is not clear (1) whether the individual issuers have sufficient incentive to join such an arrangement or (2) whether money holders would not just prefer a system where a single money acts as a medium of exchange and unit of account.

5. Conclusion

Hayek’s failure to persuade his peers on the merits of his proposal to permit concurrent competing monies may in part be due to his underestimation of the significance of network effects. There is no doubt that money can spontaneously emerge from barter. However, history suggests that once individuals converge upon a commonly accepted medium of exchange, replacing the standard with an alternative is quite difficult. This difficulty, as I have attempted to show, is not entirely the result of legal restrictions, but also reflects the network nature of money. Whether entrepreneurs are capable of overcoming network effects in practice and, if so, whether it would indeed bring about the kind of system Hayek desires remains to be seen.

References


28 White (1984, p. 699) argues the “use of a common unit of account in decentralized economic calculation presupposes a general medium of exchange.” See also: Greenfield and Yeager (1986) and White (1986).


