

THE IMPACT OF NEW PAYMENT TECHNOLOGIES

A Macro View

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From a macro point of view, the critical feature of new payment technologies is that they broaden the range of assets that can be used to carry out transactions. In so doing, they potentially allow for additional substitution for base money—directly by substitution for currency and indirectly by substitution for transaction accounts subject to reserve requirements. An example of direct substitution for currency is the increased use of credit cards, which can be interpreted as the issuing of guaranteed personal IOUs in payment. An example of indirect substitution is the increased use of checks written on money market mutual funds, which themselves are not subject to reserve requirements.

That these new technologies have these substitution effects is, of course, not surprising or controversial. These technologies have greatly reduced the cost of recording and communicating balance sheet and other information and in so doing have in effect made it easier for one person to convince others to accept payment either in IOUs or titles to other assets. I will take as given this view of the effects of new payment technologies and will focus on two questions: (1) What would happen to our monetary system—to the price level, to nominal interest rates, and to the unit of account—if the new payment technologies developed to the point where it became no more costly to carry out transactions of any type using any of a

broad range of assets than to carry them out using base money? (2) Can and should policies be adopted to offset the effects of the development of new payment technologies? I take up these questions partly in the hope that I can say a little bit that does not duplicate what others have already said.

THE CONSEQUENCES OF UNLIMITED SUBSTITUTION BETWEEN NEW PAYMENT INSTRUMENTS AND THE MONETARY BASE

My goal here is to discuss the consequences of the limiting case in which the kind of technological developments we have been discussing have reached the point where claims on "productive" assets serve as well in all transactions as units of the monetary base. This kind of question has been considered before, and I want to discuss it by referring to a passage from Samuelson's *Foundations of Economic Analysis* (1947: 123).

It is true that in a world involving no transaction friction and no uncertainty, there would be no reason for a spread between the yield on assets, and hence there would be no difference in the yield on money and on securities. Hicks concludes, therefore, that securities will not bear interest but will accommodate themselves to the yield on money. It is equally possible and more illuminating to support that under these conditions money adjusts itself to the yield of securities. In fact, in such a world securities themselves would circulate as money and be acceptable in transactions; demand bank deposits would bear interest, just as they often did in this country in the period of the twenties. And if money could not make the adjustment, as in the case of metal counters which Aristotle tells us are barren, it would pass out of use, wither away and die, become a free good.

Samuelson's discussion is relevant to a discussion of the consequences of new payment technologies because these do, in fact, seem to remove the frictions and uncertainties that prevent transactions from being accomplished with credit instruments or other assets. I want to comment on two matters raised by his discussion.

Note that while Samuelson in this passage is engaged in something of a debate with Hicks, he agrees that in the absence of all such frictions and uncertainties, all assets held must bear the same return. This means, for example, that if the monetary base continued to be held, then nominal interest rates on default-free securities would

have to be zero. They would have to be zero because people would not hold the monetary base if they had the opportunity, using new payment technologies, to transact using claims on risk-free assets the returns of which exceed that on the monetary base. The debate is about whether the monetary base would continue to be held if all such frictions and uncertainties were to disappear. In other words, it is about whether there can be an equilibrium with a zero nominal interest rate. Samuelson suggests, in subsequent passages, that this is unlikely.

One simple way to discuss whether the monetary base would continue to be held is in terms of the consequences of substitution of financial claims on productive real assets for the monetary base. My interpretation of the Hicksian position discussed by Samuelson is that this substitution would through diminishing returns force the return on productive assets down to the return on the monetary base. Samuelson, according to this interpretation, is raising the possibility that returns do not diminish quickly enough to generate such an outcome and that, instead, the solution would be one in which the monetary base disappeared. The Samuelson possibility seems plausible if only because the monetary base is such a small fraction of total wealth. It should be noted that implicit in this discussion is the assumption that policy is not being directed at raising the real return on the monetary base—say, by paying interest on reserves—to whatever level is required to make people willing to hold it.

The second point to be noted about Samuelson's discussion is that it is concerned with situations in which the monetary base is what I would call a fiat monetary base rather than a commodity monetary base, whereby fiat is meant that the object that constitutes the monetary base has no direct use as a commodity. That is why it becomes worthless, a free good, when it no longer serves as a monetary base. If units of this fiat monetary base had been serving as the unit of account, then its abandonment requires a change in the unit of account. Matters are less extreme if the object that constitutes the monetary base is a commodity. Then, although abandoning it as a monetary base may well drive its value down substantially, its value is not driven to zero. Thus, even if such a commodity is abandoned as a monetary base, it could continue to function as a unit of account.

I conclude, therefore, that if new technologies develop to the point where it is no more costly to carry out transactions using a

broad range of assets than it is to use base money, then one of two extreme results occur. One possibility is that the monetary base ends up being held and valued and that nominal interest rates on default-free securities become essentially zero. The other possibility is that the monetary base ceases being held. If that base is a fiat monetary base, as ours seems to be, then it becomes worthless and, therefore, cannot continue to serve as a unit of account. If this occurred, the unit of account role would probably end up being played by some commodity—perhaps ounces of gold. Nominal interest rates in terms of the new commodity unit of account could be positive. Both extreme possibilities are driven by substitution of what is often called “inside money” for “outside money” (the monetary base), substitution which tends to drive down the value of “outside money.” The first possibility (the Hicksian outcome) comes about if this substitution drives real interest rates down enough to produce an “internal solution”—one with real returns on other assets driven into equality with the real return on outside money. The second possibility (the Samuelson outcome) comes about if this substitution leads to a “corner solution” with real returns remaining higher than any potential equilibrium real return on outside money. In either case, the price level rises—in the second case without limit.

POSSIBLE POLICY RESPONSES TO THE DEVELOPMENT OF NEW PAYMENT TECHNOLOGIES

The above discussion of the consequences of new payment technologies has intentionally presumed two extreme sets of conditions: first, that the developments advance to the point where they permit all payments to be carried out as well with a wide range of assets as with the monetary base, and second, that there is no policy response to these developments. I now want to consider possible policy responses—responses to the general tendency of new payment technologies to lead to substitution away from the monetary base.

It is possible to take a sanguine view of erosion of the monetary base. Except in the extreme case described above where there is complete erosion, one can imagine an open market policy which, while not preventing erosion, does prevent it from impinging on the price level. That is, we can imagine an open market strategy consisting of

sales of securities that reduces the supply of the monetary base to match the reduced demand for it. The main cost of carrying out this policy is its budgetary impact in the form of increased interest payments, interest payments on the additional government debt held by the public.

There could also be a regulatory response to new payment technologies in the form of various kinds of reserve requirements or other taxes levied on their use. Indeed, it would in some sense be surprising if there were no such regulatory response. I have argued elsewhere (Wallace 1983) that the monetary base plays the critical role it does only because we have imposed regulations that prevent the use of private substitutes for the monetary base—substitutes, say, in the form of currencylike notes issued by banks. If there is a rationale for that policy—a policy that has been in effect since at least the end of the Civil War—then it would seem that it would also apply to other payment instruments that potentially substitute for the monetary base. Conversely, the obvious efficiency argument one would make for not taxing new private payment instruments also applies to not taxing or prohibiting old private payment instruments like private bank notes. The obvious efficiency argument says that one should not place arbitrary restrictions on the form that private intermediation can take because if such restrictions are binding, then one way or another they inhibit intertemporal trade.

However, as I noted above, having had such restrictions in effect for over a hundred years, it would be surprising if we now allowed them to become ineffective simply because some new payment instruments have been developed. The imposition in the Monetary Decontrol Act of 1980 (PIDMCA) of Federal Reserve reserve requirements on *all* depository institutions with transaction accounts is an instance of a regulatory response consistent with the view that we are not about to allow existing regulations to become ineffective.

CONCLUSION

I will end by recalling that I entitled my remarks the “Impact of New Payment Technologies—A Macro View.” The word “macro” is used in different ways. One use refers to questions concerning the effects of various developments or policies on the overall economy—on the price level, on interest rates, and so on. My remarks suggest

that potentially there are drastic macro effects of new payment technologies stemming from substitution of new payment instruments for the monetary base. However, I have also suggested that there are policy responses that would serve to head off these drastic effects and that the policies that would do this do not differ substantially from the kinds of policies we have had in effect for a long time. In judging these conclusions, one should, though, take note that the term "macro" is sometimes used as a pejorative—to mean sloppy, not resting on solid foundations, and so on. This sense of macro also applies to my discussion; it is not based on coherent models in which transacting is inherently difficult to carry out and in which the difficulties are overcome to various degrees by various kinds of assets. Usable models of that sort seem not to be in hand. Until they are, we are left with spelling out our hunches about what they will imply. That is all that I can claim to have done.

REFERENCES

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