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Commentary

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Twenty-five years ago, the banking system used two forms of monetary base—vault cash and deposit balances at Reserve Banks—in just two ways: required reserves and excess reserves.¹ Now, the banking system uses those same two forms of monetary base in four ways: required reserves, contracted clearing balances, surplus vault cash, and excess reserve deposit balances. The two additional uses—surplus vault cash and contracted clearing balances—account for about 90 percent of banks' holdings of monetary base that are not used to satisfy reserve requirements. The remaining 10 percent, averaging about \$1 billion for the past decade, is labeled "excess reserves."

Anderson and Rasche recognize the declining proportion of required reserves in the banking system's demand for monetary base. They determine from panel data that some subsets of banks are not likely to be affected by changes in reserve requirements because their operating needs for monetary base exceed required amounts. These non-required needs for base money show up in the Board's data series as the sum of surplus vault cash, contracted clearing balances, and excess reserves. Accordingly, Anderson and Rasche reduce the magnitude of the reserve adjustment used to derive the St. Louis measure of the adjusted monetary base. An irony of this exercise is our relative uncertainty about the relationship between the price level and various measures of the money stock that are multiples of the monetary base. Nonetheless, continued publication of a consistent measure of the adjusted base is useful as a check on policy actions and as an historical record.

The innovation to the reserve adjustment procedure may seem somewhat crude. It is capable only of saying whether subsets of banks are bound or not bound by reserve requirements. It is unable to capture the degree to which some banks might be sliding from one state to the other. Nonetheless, the new, revised adjusted monetary base represents a major step forward. Further tests with future panel data will enable St. Louis to update the reserve adjustment magnitude in the years ahead, in recognition of the headlong movement of the American banking system toward the elimination of required reserves as a constraint on bank portfolios.

REFINING DEFINITIONS AND TERMINOLOGY

Without wanting in any way to deprecate the enormous job Anderson and Rasche have done, I would like to highlight two jobs that remain to be done. One is terminological, and the other is definitional—a fine distinction, but useful. The terminological job is for those who publish the data and those who use it to settle on a common, simple set of terms to attach to the components of the monetary base and bank reserves—or should I say "depository institution" reserves? Over the past five years, I myself have followed the changing usage of the research community by referring to "required clearing balances," then "contractual clearing balances," and now, following Anderson and Rasche, "contracted clearing balances," while the Federal Reserve Bulletin refers to the same data either as "service-related balances and adjustments," or "required clearing balances and adjustments to compensate for float." And are all of banks' holdings of deposits at the Reserve Banks "reserve deposits," "reserve balances," "deposits," or "balances"? And why do we have to say "banks' holdings of

¹ I use "bank" to mean "depository institution."

monetary base,” or “banks’ holdings of vault cash and deposit balances at the Reserve Banks” rather than just “banks’ cash”? Perhaps the 13 Research Directors could sponsor a Terminological Convention at which delegates could agree on a simple, standard lexicon.

The second job that remains to be done concerns definitions of data series, regardless of the terminology used in their tags. Those of us with a morbid interest in the implementation of monetary policy also have recognized the headlong rush of the American banking system toward the elimination of required reserve portfolio constraints. Especially since the 1990-91 reduction in reserve requirements, the growth of contracted clearing balances has demonstrated how policy implementation interacts with the wholesale payments business. Not only the finesse, but sometimes even the gross results of policy actions may be affected in the short run by banks’ management of their balances at the Reserve Banks. Yet there are some obvious difficulties with the data reporting the allocation of Reserve Bank deposits among the various components. Anderson and Rasche politely mention these problems but don’t belabor them. I will, because imprecise information risks confusion in, and about, both the monetary policy and financial services functions of Reserve Banks. As Anderson and Rasche’s work makes clear, monetary policy implementation increasingly piggy-backs on the balances that banks maintain purely for operational purposes, to manage daylight and overnight overdraft risks in making payments, and to receive earnings credits with which to pay for Reserve Bank payment services.

One difficulty is that the current definition of excess reserves includes items that are not excess and other items that are not reserves. This problem did not originate with the clearing balance facility; carryover of a portion of a bank’s reserve position is a long-standing provision of Regulation D. The power to shift demand for balances between adjacent maintenance periods declines as required reserves shrink. The clearing balance facility, however, with its

penalty-free target balance range, now provides a partial alternative to using carryover, in addition to affecting the amount that is capable of being carried over.

EXCESS RESERVES: A “SLIPPERY NOTION”

The notion of excess reserves has always been slippery. In a mechanical textbook model of multiple expansion of deposits, reserves in excess of requirements are simply wasted reserves—unnecessary non-interest-bearing balances on deposit with Reserve Banks during a reserve maintenance period. But we know better than that, or if we don’t, we haven’t read Bill Dewald’s succinct explanation in the St. Louis Bank’s *Monetary Trends* last month. There, Dewald points out that the lion’s share of the difference between required reserves and the aggregate of banks’ holdings of vault cash and deposits at the Federal Reserve Banks clearly is not wasted. Banks hold clearing balances to facilitate execution of their own and their customers’ payments. And they hold surplus vault cash—the excess of vault cash over reserve requirements of those banks that meet their requirement entirely with vault cash—to meet operating needs to stock ATM machines and tellers’ stations.

The problem with applying the Dewaldian concept of excess reserves after deducting clearing balances and surplus vault cash is that it seems unlikely to give rise to a significant demand for non-interest-bearing balances, just because of the cost involved. Pure excess reserves were a cheap source of overdraft protection and liquidity in the late 1930s, when the three-month bill rate was only a couple of basis points above zero. But now, with the funds rate more than a hundred-fold higher than that, installing alternative protections against daylight and overnight overdrafts should be cheaper than deliberately holding non-interest-bearing balances.

Several alternatives come to mind. A bank might invest in a more sophisticated balance management system, to reduce the

incidence of surprise debits and credits that might cause overdrafts or surpluses. Or, a bank might arrange to make and receive more payments over a net settlement network like CHIPS, on which a bank's network partners absorb daylight imbalances between flows of debits and credits. The cost of this alternative is likely to involve using some interest-bearing collateral as a network guarantee. Or, as a third alternative, a bank simply could increase the size of its contracted clearing balance at a Reserve Bank. A larger contracted clearing balance at least earns interest at the level of the federal funds rate, although the earnings can be used only to pay for financial services bought from a Reserve Bank.

THE "HOT POTATO" RESERVES PHENOMENON

In addition to wondering why banks might demand a significant volume of pure excess reserves, there are reasons to suspect that measured excess reserves may not always reflect a demand at all. Some of the balances that show up in measured excess reserves might represent an excess supply of balances that, like hot potatoes, get tossed around from bank to bank during a day until, at the end of the day, the unfortunate last holders are stuck with the things until opening of business next day.

Once open market operations create balances on a day, there's not much the banking system can do immediately to get rid of an excess supply. Of course, being stuck with an unwanted balance overnight need not imply being stuck with an unwanted balance on average for a two-week reserve maintenance period. All that a single bank has to do to get rid of an overnight excess balance is to reduce its overnight balance by an equal and offsetting amount the next day, or by $1/n$ th of that amount daily for the n days remaining in a maintenance period, or by an average of $1/14$ th of that amount each day of the succeeding maintenance period if the amount is small enough to fit within

the reserve carryover provision. Of course, only banks that must satisfy a reserve requirement can do this. Other banks might average over a maintenance period to fit within the penalty-free range for a clearing balance, if they had contracted for one. An excessive over-night balance is simply wasted if a bank faces neither a clearing balance for averaging and a penalty-free band, nor a reserve requirement for averaging and carryover.

The "hot potato" explanation of excess reserves as an excess supply phenomenon may sound fishy for another reason. If reserves are in excess supply, the Desk should notice that the funds rate is falling. Even if the Desk doesn't have an opportunity to take back an excess supply, the fact that the funds rate falls as the market works to equilibrate quantity demanded and quantity supplied, suggests that there will be no excess in either demand or supply. Increasingly, however, the funds market may not work so predictably. The funds rate may not fully adjust to an overabundance of reserves in a maintenance period if banks have difficulty working off an unexpectedly large end-of-day balance over succeeding days. The value of wholesale payments that flow through deposit accounts at the Reserve Banks has been increasing rapidly. Levels of reserve requirements have been decreasing, and contracted clearing balances have picked up only a portion of that decline. The size of unexpected debits and credits, therefore, is probably increasing relative to the size of a bank's target balance. Of course, an unexpected shortage, no matter how large, almost certainly can be offset by buying extra funds to support a higher balance on succeeding days. An unexpected surplus, however, can be offset only to the extent that the necessary reduction in future daily balances would not draw those future balances below zero. This asymmetry may explain the tendency of many banks to rest content with negative excess reserve positions early in maintenance periods—to avoid building up surplus positions that are too big to liquidate by any means because negative

balances are frowned upon. And this may be why the Trading Desk must adopt tactics to smooth the daily supply of balances. Otherwise, days of peak supply routinely could impound balances in the positions of banks that are unable to eliminate all of their surplus. Clearly, the concept of excess reserves has an ambiguous economic identity.

Ambiguity is not the only source of imprecision in the current method of allocating deposits at Reserve Banks among components of the monetary base. Published levels of excess reserves are likely to include some clearing balances. The amount that is subtracted from total balances in addition to required reserve balances, is not actual holdings of clearing balances, but only the amount banks contracted to hold. In the present low required reserve balance environment, the difference between a bank's contracted and actual clearing balances is important in that it serves much the same role as the carry-over provisions of required reserve accounting. The ability of banks to maintain a deposit balance within a target range, rather than at a unique level, provides a cushion between demand for balances at the going funds rate and the quantity of balances made available through open market operations. The existence of a range of balances at which banks may end up without penalty acts to buffer the funds rate from small deviations between the quantity supplied and the quantity demanded.

Equally important, since 1980, the Reserve Banks have been rationalizing nationwide management of the production and marketing of their services. Successful marketing and efficient pricing hinge on knowledge of the sources of demand for various services and the public benefits they produce. A major issue must be the role of the clearing balance facility, with its spill-over effect in monetary policy implementation, in influencing the marketability of services.

BETTER DATA FOR A BETTER UNDERSTANDING

Anderson and Rasche have substantiated empirically the changing uses of Reserve Bank deposits. Further refinement

of the revised reserve adjustment magnitude would be assisted by access to better data. I don't mean to imply that the trend rate of growth of the unadjusted monetary base is being misstated because of bad data. The component uses, not the total sources of monetary base, are at issue. Better data about the clearing balance and excess reserve uses of the base might assist Anderson and Rasche in perfecting their reserve adjustment magnitude. More important, however, better data would contribute to better understanding of high frequency noise in the market for Reserve Bank deposits, of the demand for deposit balances at the Reserve Banks, and of potential synergies between Reserve Bank services and monetary policy implementation. All these things are becoming increasingly important as the banking system manages lower levels of deposit balances at the Reserve Banks.

The major problem is with current measures of excess reserves and clearing balances. First, the aggregate now labeled "excess reserves" actually contains the balances some banks use to meet reserve requirements. These are balances that are maintained in the current period but used to satisfy requirements in surrounding reserve maintenance periods in accordance with the carryover provisions of reserve accounting regulations. Similarly, aggregate excess reserves exclude some balances that are not used to satisfy current requirements, when banks use balances from surrounding periods to meet current period requirements.

Second, the current measures don't distinguish between the amount of clearing balances banks contract to hold and the amount they actually hold. As a result, some of the balances included in the reported level of aggregate clearing balances are not being held to meet contracted clearing balance obligations, while some of the balances excluded from these reports are actually being held and earning interest as such. The source of this clearing balance problem is that, as long as a bank's average balance for the maintenance period lies within the range of its required reserve balance plus 98 percent to

102 percent of the amount of its contracted clearing balance, the bank is considered to have fulfilled the terms of the clearing balance contract and receives earnings credits on the actual amount held in excess of the required reserve balance. The net amount of these deviations from contracted amounts can increase or decrease excess reserves, perhaps by only a small net amount most of the time. Thus, both the carryover provision of the reserve requirement regulation and the clearing balance provision of the Reserve Banks' priced services business more than likely result in a misclassification of a portion of many banks' balances.

One way to construct more discriminating measures would be to aggregate only within sets of banks in common positions, instead of relying on aggregates from the consolidated balance sheet of the twelve Reserve Banks. Anderson and Rasche use statistical techniques to suggest which predetermined sets of banks are likely to be bound and which are likely to be non-bound by reserve requirements. I would suggest that we compile data differently. All banks that maintain deposit balances at a Reserve Bank must be in one of three categories.² These categories are distinguished according to whether an institution's average maintained balance for a two-week maintenance period is more than adequate, adequate, or less than adequate with respect to Regulation D of the Board of Governors, which sets out the rules for managing a deposit account that can be used to satisfy both a reserve requirement and a clearing balance contract. The adequacy test varies with the nature of the bank.

REDUCING AMBIGUITY

The rules spelled out in agonizing detail in Table 1 provide an unambiguous three-way classification of the adequacy of the deposit balance maintained at a Reserve Bank by each type of bank. However, the adequacy test can be administered only after a lag of one full maintenance period. The descriptions in Table 1 are similar to the descriptions of current data on page 43 of

Anderson and Rasche, but they are aimed at defining the adequacy of a balance.

- The first set of banks contains institutions that are not required to maintain a reserve balance, either because their deposits are within the zero requirement range, or because their vault cash alone satisfies the reserve requirement. If these institutions don't contract to maintain a clearing balance, then any balance they hold in excess of zero is more than adequate, a surplus balance.

- A second set also contains institutions that are not required to maintain reserve balances, but they do contract to hold clearing balances. The adequacy criterion for this set is whether an institution's balance at a Reserve Bank is more than, equal to, or less than the range of values within the penalty-free band around its contracted clearing balance. A balance in excess of that range is a surplus balance.

- A third set contains institutions that may or may not contract for a clearing balance but that need balances in addition to vault cash to satisfy their reserve requirements, and can take advantage of Regulation D's provisions for carryover. In this case, the question is how the deposit balance, plus applied vault cash, plus any positive (negative) reserve position carried forward from $t-1$, plus any negative (positive) position carried forward to $t+1$, minus the period t reserve requirement, compares with the penalty-free range of values that satisfy the clearing balance contract (if any). A balance in excess of that range (or of zero, if the bank has no contracted clearing balance) is a surplus balance.

² The three categories discussed include institutions that may or may not hold surplus vault cash. A fourth set of institutions includes all those with no deposit balances whatsoever at a Reserve Bank, whether held directly or on a pass-through basis. These also are likely to be in a surplus vault cash position. The relevant distinction in examining excess reserves, however, is the state of deposit balances relative to a combined reserve requirement and contracted clearing balance, one or the other (but almost never both) of which may be zero.

Table 1

Components of the Deposit Position of a Reserve Bank Customer^a

Maintenance Period Position	Type of Customer		
	No Required Or Contracted Balance	Contracted Clearing Balance Only	Required Reserve (With Zero Or Positive Contracted Clearing Balance)
Surplus	If $B_t > 0$, $CB_t = 0$ $S_t = B_t$	If $B_t - 1.02CCB_t > 0$, $CB_t = 1.02CCB_t$ $S_t = B_t - 1.02CCB_t$	If $[B_t + AVC_t - RR_t - {}_{t-1}HI_t - {}_tXO_{t+1}] - 1.02CCB_t > 0$, $CB_t = 1.02CCB_t$ $S_t = [\dots] - 1.02CCB_t$
In Balance	If $B_t = 0$, $CB_t = 0$ $S_t = 0$	If $0.98CCB_t < B_t < 1.02CCB_t$, $CB_t = B_t$ $S_t = 0$	If $0.98CCB_t < [B_t + AVC_t - RR_t - {}_{t-1}HI_t - {}_tXO_{t+1} + {}_{t-1}XI_t - {}_tHO_{t+1}] < 1.02CCB_t$, $CB_t = [\dots]$ $S_t = 0$
Deficit	If $B_t < 0$, $CB_t = B_t$ $D_t = B_t$	If $B_t - 0.98CCB_t < 0$, $CB_t = B_t$ $D_t = 0.98CCB_t - B_t$	If $0 > [B_t + AVC_t - RR_t + {}_{t-1}XI_t - {}_tHO_{t+1}] - 0.98CCB_t$, $CB_t = B_t$ $D_t = 0.98CCB_t - [\dots]$

^aClearing balances receive earnings credits without penalty if the average balance is within a range of CCB plus or minus 0.02CCB, or plus or minus \$25,000., whichever is larger. For simplicity, the table ignores the latter possibility.

AVC = applied vault cash

CB = clearing balance receiving earnings credits

CCB = contracted clearing balance

D = deficit in deposit account

B = maintenance period average deposit balance

HI/HO = shortage carried in/out of period

RR = required reserve

S = surplus in deposit account

XI/XO = excess carried in/out of period

This three-way classification of the adequacy of banks' deposit balances at the Reserve Banks in period t could be used to construct three new aggregate measures. The first of the three new measures, by aggregating CB_t across all banks, would define actual aggregate clearing balances as the total volume of deposits that are receiving earnings credits. This is currently a known quantity, but it is not published on the same frequency as monetary base data, nor with the same assurance of consistency.

A second new measure would aggregate S_t across the three sets of banks for which surplus balances are greater than zero. These are true wasted balances, in that they exceed the volume for receiving earnings credits, and they exclude balances used to satisfy reserve requirements in periods $(t-1)$ through $(t+1)$. Variations in the volume of

these surplus balances might provide insight into the "cost" and efficiency with which banks are able to follow central bank rules for managing reserves and clearing balances.

The third suggested new measure would aggregate across the deficits of the three sets of banks in deficit. Perhaps this aggregate is always close to or actually equal to zero. If so, that's useful information—again, for gaining insight into the "cost" and efficiency of central bank rules.

One objection to these suggested measures might be that information for the three sets of banks in the crucial third column of Table 1 would be available only with a one-period lag, after values for carry-over were secure. The question, of course, is whether to measure what's relevant, or what's contemporaneous, and that's an easy one to answer.

Another objection might be to the potential cost of collecting new data. This doesn't look like much of a problem. Undoubtedly, there would be some costs, but mainly for reprogramming. All the micro data already are being collected in the process of administering the required reserve and contracted clearing balance functions of the Reserve Banks. And that micro data already is being aggregated in a variety of ways for the use of those functions. The benefits of consistent official publication would come from better insight into the demand for deposits at Reserve Banks, both from the vantage point of monetary policy implementation tactics and of Reserve Bank provision of payments services.

SUMMARY

Anderson and Rasche have performed two valuable services. One is their refinement of the St. Louis adjusted monetary base. The other, and to my mind at least an equally significant one, has been to document that the evolution of central banking in the United States over the past sixteen years has left us with outmoded definitions and measures of the uses of the monetary base. I hope that their work, and this Symposium, will trigger further discussions leading to reform, perhaps along the lines I have suggested.