INFLATION, NONOPTIMAL MONETARY ARRANGEMENTS AND THE BANKING IMPUTATION IN THE NATIONAL ACCOUNTS*

BY T. K. RYMES
Carleton University, Ottawa

This paper demonstrates, with the use of some recent developments in neoclassical monetary theory, that the banking imputation problem in the national accounts arises because of the regulation of banks by Authorities. It demonstrates as well that the banking imputation problem is a manifestation of the failure of the Authorities to provide optimal monetary arrangements. Some comments on existing imputations, in the light of this theory, are provided.

I. INTRODUCTION

Can the National Accounts be used in assessing the costs of inflation? Can we get with them some measure of the effects of what are considered to be inefficient monetary instructions and arrangements in modern market economies? Does that old National Accounting bugbear, "the banking imputation" problem, have some bearing on these matters?

In this paper I indicate, using some aspects of new developments in neoclassical monetary theory, how these matters are in fact all related to one another. My main concern in this paper is, however, to offer an explanation from this theoretical viewpoint as to why the "banking imputation" problem arises in National Accounting.

II. THE BANKING IMPUTATION

George Jaszi once wrote

> "The proper treatment of commercial banks in the measurement of national output has been the subject of perennial controversy, and it seems to me unlikely that a really satisfactory solution will ever be found."[1]

As is well known, when standard national accounting procedures are attempted for the measurement of domestic product originating in the banking industry, negative or "implausibly" low measures will occur. Consider the following exemplary data for a "banking industry" in which, while no service charges for services rendered are levied, banks charge higher interest rates on loans than they pay on deposits.

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[1]Jaszi, George, "The conceptual basis of the accounts: a re-examination", *A Critique of the United State Income and Product Accounts*: Studies in Income and Wealth XXII (Princeton: Princeton University Press for the NBER, 1958). For a recent discussion, see Richard and Nancy Ruggles, Integrated economic accounts for the United States, 1947–1980, *Survey of Current Business*, 62, May 1982, Annex 1.

Expenses		Revenues	
Interest paid out on deposits	850	Interest received on loans	1,000
Intermediate inputs	20	Service charges	0
Wages	100		
Profits	30		

Calculating the gross domestic product for the banking industry in two ways, one has either

$$\text{GDP} = \text{Gross output} - \text{Intermediate inputs}$$
$$-20 = 0 \qquad -20$$

or

$$\text{GDP} = \text{Wages} + \text{Profits} - \text{Interest Received} + \text{Interest Paid}$$
$$-20 = 100 \quad +30 \quad -1{,}000 \quad +850$$

The problem is said to arise because the banks do not charge explicitly or completely for the services they provide to borrowers and depositors but levy implicit charges by paying lower interest rates on deposits than they charge on loans. Reasons are offered. It is too costly for the banks to make explicit charges for each and every service. Depositors, because taxes may be levied on interest receipts, have an incentive to pay for the "free" services by earning lower interest rates on deposits. Yet many other industries do not make explicit charges for each and every service they render to customers (airlines don't charge different fares for non-smoking areas; toilets are "free" in many public places; barbers don't charge for their sprightly conversation, etc.). No one has suggested that, because of problems in the measurement of such industries' output, "imputations" must be made for them. It would be, of course, arbitrary if national accountants made imputations for the banking industry because measured gross domestic product was merely "implausibly" low. For the reasons offered, all other industries could be said to have measured outputs which could be "implausibly" high or low and if imputations are made on grounds of plausibility, then the accepted conventions of the national accounts would be in total disarray. Thus, there must be something special about the banking activity which makes it different and the "banking imputation" a significant problem in national accounting. A whole new theory of banking and optimal monetary arrangements has recently emerged which, upon examination, shows that the problem of the "banking imputation" lies at the heart of these recent theoretical developments. As well, the "banking imputation" is becoming an increasingly important practical problem. Countries extensively engaging in international banking are now finding a substantial and growing divergence between their gross national and domestic product measures.[2]

III. Neoclassical Monetary Theory: Some Recent Aspects

I cannot in this paper survey all aspects of new developments in neoclassical monetary theory. I shall, however, focus precisely upon those aspects which pertain immediately to the "banking imputation" problem.

[2]Luxembourg is a country which is now extensively engaged in international banking. Suppose the example provided above pertained to a "Luxembourg" banking industry which was wholly engaged in international banking and which obtained its intermediate inputs from abroad. From the example, Luxembourg's national product would be, other things equal, +130 while its domestic product would be −20. It is not surprising that, at the Conference, Luxembourg representatives expressed an interest in the "banking imputation" problem.

Consider first a hypothetical world as envisaged by the new neoclassical monetary theory. A "depositor" is deemed to be deriving *two* services from a bank:

(i) a portfolio service—i.e. the bank takes a "depositor's" money and invests it in a diversified portfolio of real assets directly or indirectly by purchasing equities and making loans. In this case a bank is acting like a mutual fund and either explicitly charges for the portfolio service it provides by a management fee or by paying individuals as "depositors" lower rates of return than it is earning on its portfolio of real assets. In either situation, the expected rate of return to the "depositor" is the same since the mutual fund is providing the services of diversification in a less costly way than individuals could obtain acting individually by themselves.

(ii) a fiscal agent service—in the recent literature it is argued that a "depositor" will look upon his deposit (his share in the mutual fund) as a medium of exchange or unit of account because of the fiscal agent services provided by the "bank" (or fund) for which the bank will also charge. It is the precise description of these latter services on which the current literature is not all that clear. One can describe the renting of vaults, safety-deposit boxes, the bookkeeping, the commission-charging, etc. which banks do as important components of the services rendered by banks and which are sometimes priced but it is not easy to state how to measure the right to overdraw one's account (i.e. to move from owning positive to negative shares in the fund) or the right to obtain circulating currency and coin on demand associated with deposits in the bank (or shares in the fund).

To probe deeper into the problem, I shall ignore circulating currency and coin. A bank "deposit" is a share in a mutual fund and is "real" in the sense that it is a share of all the assets purchased by the fund. A "deposit" or share then could be in units of the value of all the assets owned by the fund. The distinction between borrowers and "depositors" is now arbitrary since transactions are being executed by share ownership transfers. If a person were paid in such units and wished to accumulate real claims he would sell fewer units than are being sold to him and so build up "deposits". If a person wished to call upon real resources now to smooth out consumption streams he would be buying fewer units than he is selling and so be building up loans from (negative shares in) the fund. Transaction balances no longer exist in the sense that there is in principle, no reason for the debits and credits being executed by the banks not to add to zero. The distinction between money, equity claims or shares of real assets and real assets has now become so vague as to be non-operational. Neither the classical quantity of money nor the Keynesian liquidity preference monetary theory would apply in this hypothetical world.[3]

It will be noted that, in this world, the need for the "banking imputation" would vanish. Both the portfolio service rendered by the mutual fund and the

[3]Black, Fischer, Banking and Interest Rates in a World Without Money, *Journal of Bank Research*, Autumn 1970, 9-20. See also Eugene F. Fama, Banking in the Theory of Finance, *Journal of Monetary Economics*, VI, 1980, 39-57, and Greenfield, Robert L. and Yeager, Leland B., A Laissez-Faire Approach to Monetary Stability, *Journal of Money, Credit and Banking*, XV, August 1983, 302-315.

medium of exchange unit of account service rendered by the bank would be priced or the national accounting treatment of mutual funds would apply.

Consider now a situation more like the familiar world of costless fiat money but one in which the Authorities behave in such a way as to bring about optimum fiat money supply arrangements. I continue to ignore circulating currency and coin. Depositors in this world can be said to hold two basic types of assets, money as a bank deposit and all other assets. The holdings of bank deposits and all other assets are said to be two ways in which agents can rearrange intertemporal flows of consumption. For a temporary equilibrium to hold, the money price level of goods in general must be such that the expected net real rate of return on deposits must be equal to that on all other assets. In short, the marginal rates of transformation between present and future streams of consumption goods must be equalized by the two routes of either giving up present consumption goods and obtaining an addition to the permanent stream of such goods by buying capital goods, bonds, etc. or by "buying" money. Since the "money" is really nothing more than the shares in the banks (and the shares are in all other assets), then the equalization of expected net real rates of return on deposits and all other assets follows trivially.

To a depositor, the expected rate of return on a deposit is composed of three basic parts: (1) the marginal gains from the flow of services obtained from the bank by the use of the money; (ii) plus the nominal rate of interest being earned on the deposit; (iii) less the service charges being levied by the bank for the use of the services being provided by the bank through the instrumentality of the bank deposit. If the total nominal stock of bank deposits is given, then, should depositors wish to hold more of them, either (i) the overall level of prices must stand at a lower level such that the marginal gains from the flow of services obtained from the bank is lower, eliminating the excess demand for bank deposits and for the services of banks, or (ii) the service charges levied by banks would rise to choke off the excess demand for bank deposits and the services of banks. If interest rates on deposits, taking into account inflationary expectations, were such that a deposit was earning through the bank (or fund) a real rate of return equal to that obtainable from holding all other assets in the economy, then the marginal gains from the flow of services obtained from the bank from holding a deposit would have to equal the service charge levied by the bank. In this world again the need for the "banking imputation" would vanish. The question is, however: Why would real interest rates on bank deposits be equal to these rates earnable elsewhere? The same question is: Why would the marginal gains from the flow of services obtained from the bank from holding a deposit be equal to the service charge?

Banks themselves will hold fiat money (i.e. deposits with the Monetary Authorities) up to the point where the expected rate of returns on such "high-powered" money balances would equal the rate of return on all other assets. If the supply of high powered money were costless—or, more precisely, if no bank could be said to be faced with a service charge on the holding of reserves with the central bank which measured the marginal cost of the services rendered by the central bank, then if a real interest rate on high powered money was set equal to the real rate being earned by all other assets, banks would compete amongst

themselves for such reserves. The competition would have two results: (1) the interest rate paid on deposits would be raised to equal that paid on all other assets; and (ii) service charges would be set equal to the value of the gross marginal product of bank deposits or the value of the marginal gains from the flow of services obtained from the bank by the use of bank deposits. Why must the equality hold in this case? Competition has forced an equalization of all interest rates. The level of prices must be such that the value of the gross marginal physical product of high powered money or the value of the marginal services being provided by the central bank, because such services are deemed costless to produce, will be zero. Why? If not, if prices were such that real high-powered money balances were such that the value of gross marginal physical product of real high powered money was positive, then the real rate of return on such balances would be greater than that for all other assets, banks would continue to compete for reserves and interest rates on deposits would be bid up. Since such rates are by hypothesis equal to those holding on all other assets, the competition amongst the banks would also result in a reduction of service charges. Lower service charges make bank deposits more attractive. As members of the general public seek to hold more of such deposits, however, with nominal high powered money fixed and, through the technology of reserve holding, nominal bank deposits also determined, then prices would have to be lower. The real value of bank deposits would be greater, the value of the gross marginal physical product of such deposits or the value of the marginal stream of services being provided by the banks lower until equal to the service charges. The lower price level entails, as well, a greater real value of high-powered money and a lower value of the gross marginal physical product of real high-powered money balances. The equilibrating process can be imagined to continue until the value of the gross marginal physical product of real high-powered money balances is zero. A similar argument could be advanced, resulting in a higher price level, if it were imagined initially that the marginal physical product of real high-powered money balances were negative.

At this stage three critical observations should be made. First, the monetary arrangements are optimum in Friedman's sense[4]—i.e., the value of the marginal physical product of real high-powered money balances, deemed costless to produce, is zero and the values of the marginal physical product of bank-deposits are equal to service charges and to the real marginal resource cost of bank deposits and bank services. It should be noted that, provided nominal interest rates reflect the expected rate of inflation in the Fisherian way, there is no cost of inflation in the sense of driving monetary arrangements away from the optimal ones.[5] Second, there is no banking imputation problem! The banking industry can be treated in the National Accounts just like any other industry[6]—without fear of

[4]Friedman, M., The Optimum Quantity of Money, *The Optimum Quantity of Money and Other Essays* (Chicago: Aldine-Alberton, 1969) and three papers by Harry G. Johnson, Problems of Efficiency in Monetary Management; Inside Money, Outside Money, Income, Wealth and Welfare in Monetary Theory; and Is There an Optimum Money Supply?, *Further Essays in Monetary Economics* (London: George Allen and Unwin, 1972).

[5]The reader is reminded that circulating currency (notes and coin) are being ignored.

[6]Tobin, J., Commercial Banks as Creators of Money, Dean Carson, ed., *Banking and Monetary Studies* (Homewood, Illinois: R. D. Irwin, Inc. 1967).

measured gross domestic product being negative or even "implausibly" low. In terms of the earlier example, one would have

Expenses		Revenues	
Interest paid out on deposits	1,000	Interest received on loans	1,000
Intermediate inputs	20	Service charges	150
Wages	100		
Profits	30		

so that gross domestic product in two ways would be

$$\begin{array}{l} \text{GDP} = \text{Gross output} - \text{Intermediate inputs} \\ 130 = 150 \qquad\quad -20 \end{array}$$

or

$$\begin{array}{l} \text{GDP} = \text{Wages} + \text{Profits} - \text{Interest Received} + \text{Interest Paid} \\ 130 = 100 \quad +30 \quad -1{,}000 \qquad\quad +1{,}000 \end{array}$$

The reason why the "banking imputation" problem does not arise is because banks optimally determine their reserve requirements and full interest rates equal to real rates in the economy are paid on such reserves. In the language of much recent literature, the banks are "unregulated"—that is, there is no restriction on the interest rates they can pay on deposits, there is no legal cash reserve ratio requirement they are required to maintain and there is payment of competitive interest rates by the Monetary Authorities on high-powered money held as reserves by the banks.

Third, it should be remembered that it is positive real interest rates which are to be paid on high-powered money. If nominal interest was paid and the resulting expansion of high-powered money by such interest payments was not taxed away by a system of lump-sum taxes then the resulting inflation would cause the real interest rate on money balances to be lower than real rates on all other assets and non-optimality in monetary arrangements would hold and the "banking imputation problem" would reappear to trouble national accountants.[7]

If the government, while leaving the banks unregulated in every other aspect, did not pay interest on reserves, then the real interest rate on "high-powered" money would be negative, equaling the negative of the steady perceived rate of inflation so that the higher the rate of inflation, the lower the real rates on high powered money. Even if the rate of inflation were zero, for the rate of return on reserves to be consistent with that to be earned on all other assets, the marginal physical product of real high powered money would have to stand at a higher level which would require lower real bank deposits and higher price levels. This would be brought about by banks reducing their demand for reserves and consequently their demand for the money of depositors. As a consequence there would be a reduction in interest rates paid by banks on deposits. Depositors, finding rates on deposits less attractive than rates on all other assets, would, in attempting to move from deposits to other assets, drive up the price level bringing

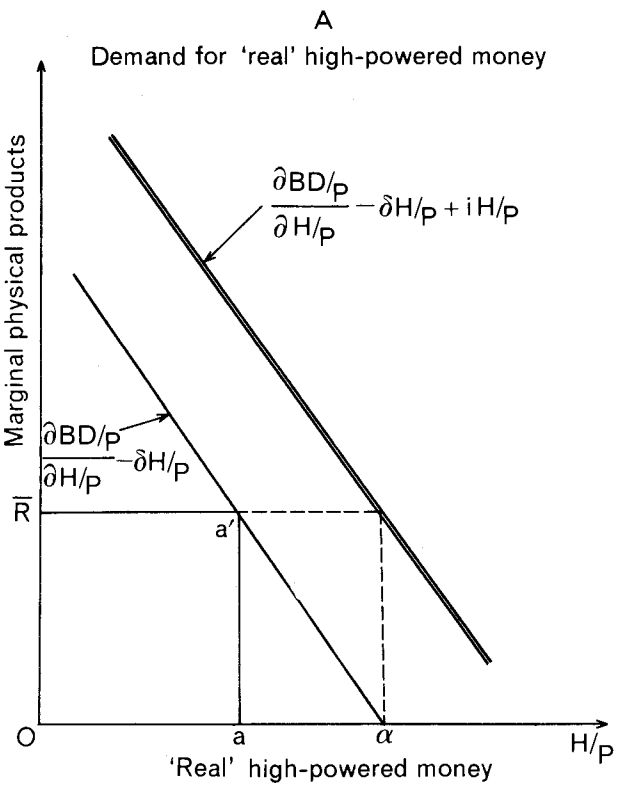
[7]Whether such a system of continuous lump-sum taxes could be arranged is an important theoretical and practical problem not addressed in this paper but it is a question which may be posed to *all* variants of optimum money supply policies.

about the required reduction in real high powered money and bank deposits so that respectively their marginal physical product would rise to offset the lower interest rates. Since the services of bank deposits are the services of banks, the demand for such services by depositors would also fall leading to a reduction in the demand and supply prices of banking services, the service charges. This reduction in services charges would modify the higher level of prices just described. As a result of the government not paying interest on reserves (and the result would be exacerbated if the government insisted banks hold reserves higher than those determined optimally by the banks or set an upper limit to the level of interest rates banks could pay on deposits), one would observe positive marginal physical products of high-powered money or positive marginal physical products of the services of the Monetary Authorities which, since both are deemed to have a zero marginal cost, should for optimality be zero. The marginal physical products of real bank deposits or the marginal physical product of bank services would stand above bank service charges and interest rates on bank deposits would be below those earned on loans. To the economic theorist, non-optimum monetary arrangements would hold (again exacerbated if inflation was positive). To the practicing national accountant, bank services would appear to be underpriced and the problem of the "banking inputation" would arise.

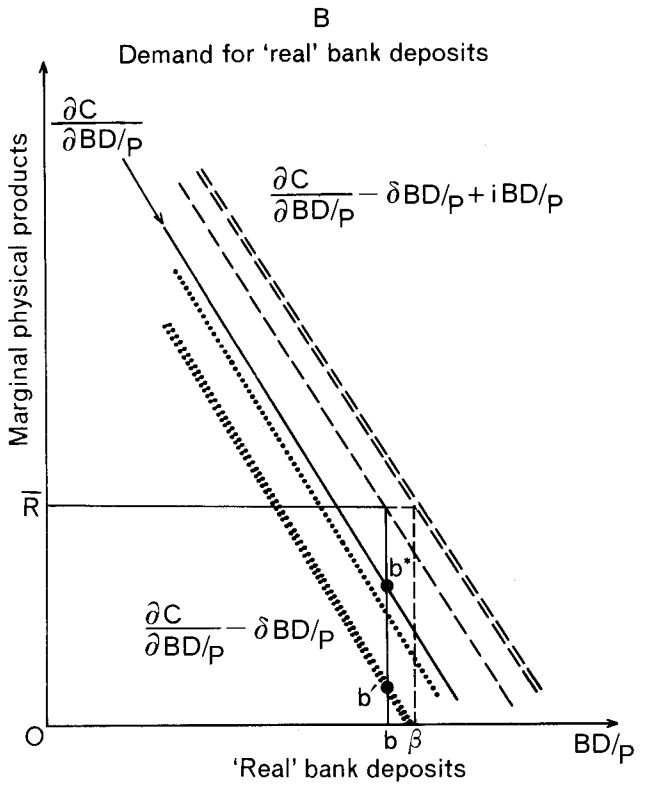
> "A remarkable result holds. The need for the banking imputation (i.e. the failure of the banks to price their services in such a manner as to ensure that the standard measurement by national accountants of the value added of such financial intermediaries results in meaningful numbers) arises not because of any peculiarities with which the services of financial intermediaries are priced but rather because of collective regulation of banks. Not only that but that collective regulation results in non-optimal money supply arrangements."[8]

To visualize the foregoing argument, consider Figure 1 which is a partial equilibrium representation of the non-optimum monetary arrangements associated with regulation of banking by the monetary authorities. In Figure 1, it is assumed that there is zero inflation and that the competitive rate of return on all other assets, $\bar{R}$, is determined exogenously. The single lines refer to regulated non-optimal monetary arrangements and the double lines to those arrangements said to be optimal. In the first case, no interest is paid on high-powered money (reserve deposits with the central bank) held by the competitive banks. In Panel A, the schedule labelled $(\partial BD/P)/(\partial H/P) - \delta_{H/P}$ shows that the net marginal physical product of "real" reserves in the production of "real" bank deposits [or, the net marginal physical product of the services of the monetary authorities in the provision of the services of banks], net in the sense of the gross marginal physical product less the carrying cost or service charge on each dollar of high-powered money, is as usual treated as inversely related to "real" reserves. The price level, P, must be such that, given the nominal supply of high powered money by the monetary authorities, "real" high powered money (H/P) is Oa such that the net marginal physical product of high-powered money equals the

[8]Rymes, T. K., The Treatment of Money, Monetary Intermediaries and Inflation in National Accounting, mimeo, June 1983.



Key: Double line is schedule for optimum monetary arrangements



Key: Double dashed and dotted lines are schedules for optimum monetary arrangements

Figure 1

given net rate of return, $\bar{R}$. In Panel B, the gross marginal physical product schedule of "real" bank deposits (or the gross marginal physical product of the services of the banks)—the single continuous line labelled $\partial C/\partial BD/P$—is inversely related to "real" bank deposits, the net marginal physical product schedule is the single dotted line and the net marginal product *plus* the interest rate paid on bank deposits is shown as the single dashed line. The fact that interest is not earned by the banks on reserves prevents the banks from paying the going rate of interest, $\bar{R}$, on bank deposits. It then follows that, since the net marginal physical product of bank deposits *plus* the interest rate on bank deposits must equal the going rate of return, $\bar{R}$, the net marginal physical product of bank deposits must be positive or the service charges will fall below the resource cost of bank deposits and non-optimality prevail.[9] Suppose that in addition to not paying interest on reserves, the monetary authorities required the banks to hold legal cash reserves in excess of those optimally held. This would further "distort" the choice of techniques of production by banks and, because the profitability of holding reserves would be even lower, banks would compete even less for reserves, interest rates on deposits would be lower, the demand for bank services less, service charges would be lower and the net marginal physical product of bank deposits would have to stand even higher. Similar arguments can, of course, be developed for those regulations which entail different legal cash ratios, restrictions on interest payments on deposits and loans, restrictions on lending policies, and so forth. And, what is most important of all to note is that the distortions back their way through the whole economic system since all other industries and consumers employ directly or indirectly the services of banks and a great many other industries are, to varying degrees, in the activity of financial intermediation.[10]

If rates of interest on reserves equal to the prevailing rate of return, $\bar{R}$, were paid, however, then, as shown in Panel A, the double lined curve, with $i_{H/P}$ $(=\bar{R})$ added to the marginal product schedule, would ensure that the price level would be at a level where real reserves were equal to α, the marginal physical product of real reserves would be zero but the rate of return on reserves would be competitive with all other assets since $i_{H/P}=\bar{R}$. As a consequence, as is illustrated in Panel B, both service charges and interest rates on bank deposits would be higher (as shown by the double-dashed line being *higher* than the single-dashed line and the double-dotted line being *lower* than the single-dotted line), the price level would be lower and real bank balances would be at β where the net marginal physical product of real bank balances and services [the gross marginal product less the service charge] would be zero and the nominal rate of

[9]In this limited partial equilibrium analysis, the static welfare cost of non-optimality and regulation would be represented in Figure 1 by the sum of the triangles $aa'\alpha$ and $bb'\beta$. It must be remembered that such welfare losses have nothing whatever to do with those said to arise from monopoly in banking. See Rhoades, Stephen A., Welfare Loss, Redistribution Effect, and Restriction of Output Due Monopoly in Banking, *Journal of Monetary Economics*, IX, May 1982, 375-387.

[10]A "country bank" will hold its reserves in the form of deposits with a bank. The failure of the authorities to pay interest on the reserves of the bank implies that the interest rate being earned by the "country bank" on its reserves is also suboptimal. A full general equilibrium analysis would have to be used to capture the welfare cost of the regulations. The failure of the Authorities to make monetary arrangements optimal would even, of course, distort work-leisure choices. See Leach, John, Inflation as a Commodity Tax, *Canadian Journal of Economics*, XVI, August 1983, 508-516.

interest on bank deposits would be equal to $\bar{R}$. All welfare losses associated with the non-payment of interest rates on high-powered money would be eliminated. In the view then of the new neoclassical monetary theory for that part which continues to recognize the existence of costless fiat money, the failure of the Monetary Authorities to pay interest on the reserves of banks (and other regulations as well) causes the cancer of non-optimality to spread far and wide through the whole body economic of modern enterprise societies.

The costs of inflation, interpreted as a movement away from the optimum monetary arrangements, could be easily encompassed within this analysis. In Figure 1, it was indicated in Panel A that optimum monetary arrangements would prevail where the demand for high-powered money schedule was considered when an interest rate equal to the prevailing rate of return was paid on such balances (the schedule described as $(\partial BD/P)/(\partial H/P) - \delta_{H/P} + i_{H/P}$). If, however, a positive steady rate of inflation is introduced[11] equal for expositional purposes to the nominal interest rate paid by the authorities on high-powered money then so far as the banks would be concerned the *real* interest rate on their reserves of high-powered money would again be zero. It would be as if the authorities were again paying no real interest rate on costless high powered money. Diagrammatically, in Panel A, the holdings of real reserves would be driven back to *Oa* and in Panel B, the holdings of real bank deposits back to *Ob*, the measure of the welfare costs of inflation in this examplary exposition would be the same as the welfare costs of non-optimal monetary arrangements. This is precisely what the part of neoclassical monetary theory I am examining considers inflation to be.[12] In this paper, however, I am concerned with the "banking imputation problem." We now see that, while it is sharply noticeable for banks, it extends in principle to all industries whose activities include financial intermediation.

III. Solutions?

If the new neoclassical monetary theory is correct, then existing or proposed imputations to "resolve" the banking problem are indeed highly suspect. The current SNA treatment is to assume that the difference between interest receipts and interest payments plus actual service charges represents the "true" service charges which banks should levy. In our example, the SNA imputation would be

Expenses		Revenues	
Interest paid out on deposits	850	Interest received on loans	1,000
Intermediate inputs	20	Imputed service charges	150
Imputed interest income	150		
Wages	100		
Profits	30		

[11]The inflation will come about if (say) the lump sum taxes mentioned in footnote 7 were not collected.

[12]Measures of the welfare costs of inflation are not the same question as how the national accounts (the government sector's recorded deficit, for example) are affected by inflation. See Siegel, J. J., Inflation-Induced Distortions in Government and Private Savings Statistics, *Review of Economics and Statistics*, LXI, February 1979, 83-90; Bruce, N. and Purvis, D. D., Fiscal Policy and Recovery from the Great Recession, *Canadian Public Policy*, IX, March 1983, 53-67; and Hibbert, Jack, *Measuring the Effects of Inflation on Income, Saving and Wealth* (Paris: OECD, 1983).

However, because only a fraction of bank deposits are held by households (and/or governments) it is argued that that fraction of imputed service charges should be considered as part of final consumption expenditure and the remainder treated as intermediate inputs used by other industries resulting in a reduction in their measured gross domestic product, or as intermediate input in a dummy financial industry. Thus, the current SNA banking imputation results in overall measured gross domestic product being increased by only that fraction of imputed service charges credited to households/governments. The imputed increase in gross domestic product will not measure the welfare loss set out above. Since, from Panel B in Figure 1,

$$\bar{R} = \frac{\partial C}{\partial BD/P} - \delta_{BD/P} + i_{BD/P},$$

or

$$[\bar{R} - i_{BD/P} + \delta_{BD/P}]BD = \frac{\partial C}{\partial BD/P} \cdot BD \tag{3.1}$$

one can argue that $(\bar{R})BD$ is the flow of nominal interest receipts of the banks, $(i_{BD/P})BD$ is the interest payments by the banks and $(\delta_{BD/P})BD$ are service charges, it follows that the imputed gross domestic product for the banks would be the left hand side of 3.1 or in Figure 1, $Ob \cdot bb^*$. There is, of course, no reason for that measure to equal the welfare loss $bb'\beta$, particularly so when only a fraction of $Ob \cdot bb^*$ is to be added to overall gross domestic product. If the SNA "banking imputation" treatment were replaced by treating interest receipts and payments as gross inputs and intermediate inputs as if they were rental payments for the use of money,[13] then as a resolution to the "banking imputation" problem this suggested treatment would be seen to be useless from the neoclassical monetary theoretical viewpoint if banks were deregulated.

Far more importantly, given the theoretical reason for the need for the "banking imputation" advanced in this paper, the attempt by whatever method (SNA, Warburton, Sunga etc.) is employed by national accountants to overcome the problem can be seen to be an attempt to paper over the cracks in the conventional measurement of value added in financial intermediation activities, *the cracks appearing because of government regulation.* The "distortions" in the price system engendered by that regulation result in negative value added for the banking industries when conventional measures of value added, using observed prices and quantities, are constructed. "Imputations" are seen from this theoretical viewpoint as an attempt to "add back to GDP" some measure of the costs of the regulation. As I have shown in this paper, however, the "banking imputation,"

[13]See, for example, Warburton, C., Financial Intermediaries and Interest paid by Business Firms to Banks, *A Critique of the United State Income and Product Accounts*, Studies in Income and Wealth XXII (Princeton: Princeton University Press for the NBER, 1958) and Sunga, P., The Treatment of Interest and Net Rents in the National Accounts Framework, *Review of Income and Wealth*, XIII, March 1967, 26-35 and An Alternative to the Current Treatment of Interest as Transfer in the United Nations and Canadian System of National Accounts, *Review of Income and Wealth*, series 30, No. 4 (December 1984).

as customarily understood, in no way measures the welfare loss involved in the regulation of financial intermediaries. Indeed, from the viewpoint of recent neoclassical monetary theory, which is one explanation as to why the problem arises, the proposed "imputation" solutions to the problem have no theoretical justification at all.

IV. Conclusion

In this paper I have demonstrated the remarkable result that the "banking imputation" problem, as evidenced in the National Accounts, arises, in the context of modern neoclassical monetary theory, from the regulation of financial intermediation by authorities. Such regulations as (i) not paying interest on banks' reserves, (ii) binding legal cash reserves, (iii) limitations of interest payments and charges banks can make create a state of affairs in which banks' service charges fall below the cost of services provided by banks and result in general in interest rates on deposits being less than those on loans and advances—the conditions giving rise to the "banking imputation" problem—and result in non-optimality of monetary arrangements. Current imputations to "solve" this problem are unsatisfactory, as George Jaszi suggested, because they rest on no acceptable theoretical base.

A question of fundamental importance, however, remains to be posed and answered. Is there a competing monetary theory which could not only predict and explain the emergence of the "banking imputation" problem, but as well offer us better guidance as to how to resolve the measurement problems? I believe there is. It is the Keynesian monetary theory as set out in Chapter 17 in *The General Theory.*[14] That, however, must be the occasion for another paper.

[14]In the paper presented at the IARIW 18th General Conference, I set out the rudiments to the alternative Keynesian monetary theoretical approach.