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INTERNATIONAL FINANCIAL INTERMEDIATION: INTERPRETATION AND EMPIRICAL ANALYSIS

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IN THEIR now classic article, Despres, Kindleberger, and Salant [2] set forth a novel framework for analyzing the balance of payments of the United States. If correct, their analysis, which is referred to as the hypothesis of International Financial Intermediation (IFI), leads to the following conclusions: (*a*) Persistent deficits, within some limits, may not be an indication of a disequilibrium position in the sense that the dollar is overvalued relative to other currencies. Instead, these deficits may actually be necessary for a healthy world economy. (*b*) Lack of confidence in the dollar is brought about by a failure to understand the international role of the dollar. (*c*) Unless controls are exceptionally pervasive, the normal tools of macroeconomic policy are likely to fail in controlling the deficit. A fourth point derived from the Despres-Kindleberger-Salant analysis is that most interpretations of the deficit of the United States incorrectly emphasize a need for additional external liquidity, when instead, the private capital market can, and should, provide this external liquidity in addition to internal liquidity.

The purpose of this paper is twofold. First, a formal model will be developed that is consistent with my conception of the IFI hypothesis. The model will be formalized in such a manner that its implications can be systematically derived. Secondly, the hypothesis itself will be tested with quarterly data covering ten years of balance-of-payments experience of the United States.

In general, one can visualize equilibrium analyses of the balance of payments in three broad classes of models. The first class, which is

NOTE: Comments and discussions with R. Coates, E. Fama, and R. Mundell proved very helpful to me. I also want to thank R. Cocks and R. Winter for helping in the statistical work.

currently accepted orthodoxy, assumes that, both conceptually and empirically, the monetary movements, i.e., approximately the below-the-line account of the "official settlements" balance, is the residual. The second class of models assumes that the bond market, i.e., an approximate equivalent to the capital accounts of the balance of payments, is the residual. The IFI hypothesis fits into this second class of models. The third class which, to my knowledge, has never been seriously advanced, assumes that the residual is the current account of the balance of payments. Naturally, in a fully specified complete system, it should make little difference which account is the residual. (In the traditional literature on the balance of payments, the residual account is often referred to as being induced.) Given the progress of general-equilibrium theory to date, such consistency among the three broad categories does not exist. In general, the empirical results tend not to reject the IFI hypothesis. It is, however, impossible with our data to distinguish this hypothesis from one that postulates a world in which the bond market is the residual.

At the outset, it must be emphasized that any attempt to formalize the IFI hypothesis must discard many of the caveats and qualifications which appeared in the original article. This simplification is not done to ridicule the model or to expose it to the maximum risk of rejection. The purpose is merely to present the essential features of the model in as simple a manner as possible. One major strand of the Despres-Kindleberger-Salant paper is omitted entirely from the present analysis —the trade in longer-term financial assets. Although admittedly important from many points of view, trade in such financial assets does not materially affect the over-all balance-of-payments figures. In addition, from an empirical viewpoint, data on gross long-term flows would be difficult to obtain.

1 INTERNATIONAL FINANCIAL INTERMEDIATION: INTERPRETATION

THE IFI hypothesis begins by postulating a demand for money on the part of private sectors in the individual countries. In general, three

arguments enter this demand function: the over-all price level, real income, and a price term for money. Both the over-all price level and real income affect the demand for money positively and with roughly the same magnitude. The demand for money, however, is negatively related to the price term for money. Thus, the higher the price of money, the lower the demand. The "price of money" should be thought of as an interest rate which includes implicit price factors—the availability of money and so on.[1] Let us describe country i's demand function for money as follows:

$$L_i = kY_iP + l_ir, \text{ where } i = 1, n \tag{1}$$

and

$$k > 0, l_i < 0,$$

and where L_i is the demand for nominal money on the part of country i; k is the nominal income coefficient of the demand for money—assumed to be the same for all countries; and Y_i is the level of real income prevailing in country i. P is the world's price level—assumed to be the same in all countries. The interest-rate coefficient of the demand for money in country i is l_i, where $l_i/Y_i = w_i$, and where w_i is assumed to be constant. Finally, r is the world's interest rate—assumed to be the same in all countries.[2]

Starting from equation (1), country i's demand function for money, the amount of additional nominal money demanded between two points in time, $\dot{L}_i$, by country i is as follows:[3]

$$\dot{L}_i = kP\dot{Y}_i + kY_i\dot{P} + l_i\dot{r} + r\dot{l}_i, \tag{2}$$

where a dot over a variable represents the change in that variable over the time period. Thus, the increase in the demand for money depends crucially upon the change in the level of real income, the change in the

[1] For several reasons an interest rate is not the price of money. In the first place, money often has an explicit yield in the form of lower service charges or preferential borrowing rates. Secondly, holding short-term bonds is only one alternative to holding money, and for this reason, some average of the price of money in terms of other alternatives must also be included in its price. Finally, the rate of interest refers only to the price one must pay to hold money for one period, whereas the price of money includes its price in perpetuity.

[2] See [2, p. 47].

[3] The interaction term, $k\dot{Y}_i\dot{P}$, is assumed to be so small that it can be neglected without affecting the argument.

world's price level, and the change in the level of the world's price term for money.

At this stage of the development of the model, we can bring in the unique aspects of the IFI hypothesis. According to Despres, Kindleberger, and Salant, "Banks and other financial intermediaries, unlike traders, are paid to give up liquidity. The United States is no more in deficit when it lends long and borrows short than is a bank when it makes a loan and enters a deposit on its books" [2, p. 44]. Thus, the unique role of the United States is that of major supplier of money to the rest of the world. In an extreme form, in order to simplify the analysis without loss of generality, we can consider the United States as the sole supplier of money to the world. Thus, from one equilibrium position to the next, the increase in the world's supply of money, $\dot{M}S$, originates in the United States. In order to maintain equilibrium, the world's increase in the demand for money must equal the world's increase in the supply of money. Thus,

$$\sum_i \dot{L}_i = \dot{M}S. \tag{3}$$

Substituting equation (2) into equation (3) and transposing terms, we obtain the following relationship:

$$\dot{M}S = \dot{P}k\sum_i \dot{Y}_i + k\dot{P}\sum_i Y_i + \dot{r}\sum_i l_i + r\sum \dot{l}_i. \tag{4}$$

We are now able to solve for the change in the equilibrium of the world's price level over the time period under consideration:

$$\dot{P} = \frac{\dot{M}S - Pk\sum \dot{Y}_i - \dot{r}\sum l_i - r\sum \dot{l}_i}{k\sum Y_i}. \tag{5}$$

As stated earlier, l_i/Y_i equals w_i, where w_i is a constant for each country i, and therefore $\dot{l}_i = w_i\dot{Y}_i$. Substituting again, we obtain the somewhat more familiar relationship of

$$\dot{P} = \frac{\dot{M}S}{k\sum Y_i} - P\bar{g} - \frac{\dot{r}\bar{w}}{k} - \frac{r\bar{w}\bar{g}}{k},^{4} \tag{6}$$

where $\bar{g} = \dfrac{\sum \dot{Y}_i}{\sum Y_i}$, and $\bar{w} = \dfrac{\sum l_i}{\sum Y_i}$.

[4] Growth in real output, Y_i, and the proportional interest-rate coefficient of the demand for money, w_i, are assumed to be independent such that $\sum w_i\dot{Y}_i = \bar{w}\sum \dot{Y}_i$.

Here the absolute change in the equilibrium price level is functionally related to the increase in the money supply of the United States, the real rate of growth of the world economy, and the change in the world's price term for money. Equation (6) represents the equilibrium change in the price level of the world. We are now able to go back to the increase in the demand for money by each country i, because we have ensured the completeness of the system insofar as the increase in the supply of money is equal to the increase in the demand for money. Hence from equations (2) and (6) we obtain

$$\dot{L}_i = kP\dot{Y}_i + l_i\dot{r} + r\dot{l}_i + kY_i\left(\frac{\dot{M}S}{k\Sigma Y_i} - P\bar{g} - \frac{\dot{r}\bar{w}}{k} - \frac{r\bar{w}\bar{g}}{k}\right). \tag{7}$$

Cancelling terms, we obtain the following:

$$\dot{L}_i = p_i\dot{M}S + (kP + rw_i)(\dot{Y}_i - \bar{g}Y_i) + (w_i - \bar{w})Y_i\dot{r},^{5} \tag{8}$$

where $p_i = Y_i/\Sigma Y_i$.

This then represents the equilibrium increase in money—both demand and supply—for each and every country i.

Now, for any country i other than the United States, insofar as we have assumed that all the increase in the supply of money comes about via the monetary authorities of the United States, the increase in money must reveal itself in the balance of payments.[6] Thus the increase in the stock of money is equal to the over-all surplus in the balance of payments or, in other words, exports less imports plus net capital inflows. Hence,

$$\dot{L}_i = X_i - M_i + K_i, \tag{9}$$

where X_i is country i's export of goods and services, M_i is country i's import of goods and services, and K_i is this country's net international capital inflow. Transposing the terms, we obtain an expression for country i's net capital inflows:

$$K_i = -(X_i - M_i) + \dot{L}_i, \tag{10}$$

and substituting equation (8) into equation (10) we get

[5] This assumes that $r\bar{g}$ is sufficiently small so that it can safely be ignored.

[6] Credit creation is ignored in this paper but may, in fact, be very important. A good analysis of credit creation can be found in Mundell [5].

$$K_i = -(X_i - M_i) + (kP + rw_i)(\dot{Y}_i - Y_i\bar{g}) + p_i\dot{MS} + Y_i\dot{r}(w_i - \bar{w}). \quad (11)$$

For the United States, the financial intermediary nation, the increase in domestically held money does not come solely from balance-of-payments surpluses. Being the intermediary nation, the United States is the world's producer of money and, therefore, the increase in domestically held money equals the amount of domestically produced money less the over-all payments deficit. Hence,

$$\dot{L}_{US} = X_{US} - M_{US} + K_{US} + \dot{MS}. \quad (9')$$

Solving for net capital inflows into the United States, we get

$$K_{US} = -(X_{US} - M_{US}) + \dot{L}_{US} - \dot{MS}. \quad (10')$$

Substituting equation (8) into equation (10') and combining terms, we obtain

$$K_{US} = -(X_{US} - M_{US}) - (1 - p_{US})\dot{MS} + (kP + rw_{US})(\dot{Y}_{US} - Y_{US}\bar{g}) + Y_{US}\dot{r}(w_{US} - \bar{w}). \quad (11')$$

With this formulation for net capital inflows into the United States, we have most of the essence of the IFI hypothesis. Despres, Kindleberger, and Salant argue that, unless pushed to extremes, the change in the interest-rate coefficient, $w_{US} - \bar{w}$, is, in fact, very small. This can be seen from their statement that "an attempt to halt the capital outflow by raising rates in the United States either would have little effect over any prolonged period or else would cripple European growth" [2, pp. 46–47]. Needless to say, the size of $w_{US} - \bar{w}$ is an empirical question.

From the equation determining the capital flows we can also understand how the authors can conclude:

> With capital markets unrestricted, attempts to correct the "deficit" by ordinary macro-economic weapons are likely to fail. It may be possible to expand the current account surplus at first by deflation of United States income and prices relative to those of Europe; but gross financial capital flows will still exceed real transfers of goods and services so long as capital formation remains high in Europe [2, p. 43].

This is most easily seen if we solve for the over-all balance of payments of the United States. Analytically this is nothing more than adding exports and subtracting imports from the net-capital-inflow equation—equation (11'). This is shown as equation (12):

$$B_{US} = -(1 - p_{US})\dot{M}S + (kP + rw_{US})(\dot{Y}_{US} - Y_{US}\bar{g}) + Y_{US}\dot{r}(w_{US} - \bar{w}), \quad (12)$$

where B_{US} is the over-all balance of payments of the United States.

From this relationship, the current account does not enter into the determination of the over-all balance of payments. In fact, any increase or decrease in the current-account surplus of the United States will be matched *pari passu* by an increase or decrease in the deficit on capital account. Furthermore, the only factors that will affect the over-all balance of payments of the United States are the absolute increase in the supply of money in the United States, the relative rate of income growth between the United States and Europe (or—in the authors' own phrase—"capital formation"), and finally, the diminutive effect (according to Despres, Kindleberger, and Salant) of changes in the price term for money. In one sense, the authors err when they imply that monetary policy, one of the "ordinary macro-economic weapons," will not succeed. This, however, may be explained by their implicit assumption (found also in their description of the goods market) that Europe is a "small country," i.e., $p_{US} = 1$. In this sense, $1 - p_{US}$ would equal zero.

So far we have implicitly been referring to the liquidity definition of the United States balance of payments and its implied definition of net capital inflows as excluding increases in American liquid liabilities to foreigners. When we move to the official-settlements definition of the balance of payments—which appears to be far preferable—we have to include an analysis of changes in American liquid liabilities to private foreigners. Despres, Kindleberger, and Salant [2, p. 49] argue that foreigners, in general, will wish to accumulate liquid dollar assets for dollar-transactions purposes and possibly as compensating balances for dollar debts. Thus, net private capital inflows into the United States additionally will be a function of changes in the level of foreign dollar transactions, ΔXSA. Adding this to the net-capital-inflows equation (11'), we obtain the following over-all equation for private and net capital flows of the United States:

$$K_{US} = -(X_{US} - M_{US}) - (1 - p_{US})\dot{MS} + (kP + rw_{US})(\dot{Y}_{US} - Y_{US}\bar{g}) + Y_{US}\dot{r}(w_{US} - \bar{w}) + a\Delta XSA, \quad (13)$$

where $a > 0$.

Equation (13), with a minor adaptation, is the equation which will be used to test the IFI hypothesis in the next section.

2 INTERNATIONAL FINANCIAL INTERMEDIATION: EMPIRICAL ANALYSIS

IN THE first section of this paper, I formally developed the equation for the equilibrium net capital inflow of the international financial intermediary, the United States. In this section, I plan to test that model as simply and as thoroughly as the existing data and theory permit. In general, my results support this version of the IFI hypothesis although they do not enable one to distinguish the IFI hypothesis from models such as those found in the work of Mundell [6] or Laffer [4].

The data (see the Appendix) are on a quarterly basis and go from the first quarter of 1958 through the last quarter of 1967. Thus, there are forty observations of the balance-of-payments data for the United States and of other variables.

Prior to the actual testing of the model, I want to make one modest adjustment. The average rate of growth in the world, $\bar{g}$, can be decomposed into two separate factors: the growth rates of the United States and the rest of the world. Thus, $\dot{Y}_{US} - Y_{US}\bar{g}$ becomes $(1 - p_{US})\dot{Y}_{US} - p_{US}\dot{Y}_F$. The equation for the net capital inflow of the United States now reads as follows:

$$K_{US} = -(X_{US} - M_{US}) - (1 - p_{US})\dot{MS} - (kP + rw_{US})p_{US}\dot{Y}_F + (kP + rw_{US})(1 - p_{US})\dot{Y}_{US} + Y_{US}\dot{r}(w_{US} - \bar{w}) + a\Delta XSA. \quad (14)$$

The empirical counterparts to the above theoretical variables are as follows:[7]

[7] The actual data and their sources are in the Appendix.

K_{US} is the net private capital flow of the United States (both foreign and domestic) plus errors and omissions;

$X_{US} - M_{US}$ is the total current-account balance of the United States;

$\dot{M}S$ is the change in the money supply of the United States;

$\dot{Y}_F$ is the change in a weighted average of foreign industrial production indices;

$\dot{Y}_{US}$ is the change in the industrial production index of the United States;

ΔXSA is the monthly change in the seasonally adjusted monthly exports of the United States; and

$Y_{US}\dot{r}$ is the change in velocity—the industrial production index of the United States divided by the money supply—standardized by the level of the industrial production index.[8]

The results of the first regression are as follows:[9]

$$K = -39.7 \underset{(.33)}{} - 1.04\underset{(8.89)}{}(X - M) - \underset{(2.22)}{}.419\dot{M}S + 580\underset{(2.31)}{}\dot{Y}_{US}$$

$$+ 4.58\underset{(0.11)}{}\dot{Y}_F + \underset{(2.08)}{}.452\Delta XSA + 429\underset{(2.28)}{}Y_{US}\dot{r}.$$

$$\bar{R}^2 = .724 \qquad F = 14.4 \qquad SEE = 425 \qquad DW = 1.82$$

After eliminating the statistically insignificant variable from the regression we obtain[10]

[8] Our theory to date deals with the world's price term for money, which should represent some composite average of alternative assets' nominal yields less the nominal yield on money itself. Estimation of either the composite average or the nominal yield on money is subject to sufficient error virtually to guarantee spurious results. We, therefore, went directly to a measure of velocity, which is the variable the price of money should, in fact, affect.

[9] The numbers in parentheses below the coefficients are the t-tests, e.g., the coefficients divided by their respective standard errors.

[10] Putting this equation in its balance-of-payments form (e.g., $K - X + M$), as was done in Laffer [4], has virtually no effect on either the coefficients or their t-tests. The $\bar{R}^2$ and F are .293 and 3.63, respectively.

$$K = \underset{(0.33)}{-30.3} \; \underset{(9.23)}{-1.04(X-M)} - \underset{(2.40)}{.425\dot{M}S} + \underset{(2.53)}{590\dot{Y}_{US}}$$

$$+ \underset{(2.24)}{.456\Delta XSA} + \underset{(2.48)}{436Y_{US}\dot{r}}.$$

$$\bar{R}^2 = .724 \qquad F = 17.8 \qquad SEE = 418 \qquad DW = 1.80$$

Increases and decreases in foreign income are found not to have a statistically significant effect on net capital inflows of the United States. This is the lone piece of evidence that mars the otherwise confirming results for this version of the IFI hypothesis.

The IFI hypothesis postulates that the partial derivative of the net private capital movements with respect to the current account should, in fact, be minus one. The net regression coefficient was −1.04, which is less than one-half of one standard error away from minus one. The change in the money-supply variable presents the strongest evidence in support of this version of the IFI hypothesis, even though it is tacitly rejected by the authors of the IFI hypothesis. An increase in the money supply of the United States of one billion dollars during a quarter is associated with an additional net capital outflow of 425 million dollars.[11] This relationship (425 : 1000) approximates the proportion of world income earned by countries with convertible currencies other than the United States, $1 - p_{US}$.[12] If the United States were not a producer of the international money, we should expect to find a positive relationship between net capital inflows and changes in the money supply. To the extent that the United States is not the sole producer of money in the world, the coefficient of the change in the money-supply variable is biased upward, i.e., the true coefficient should be more negative.

Increases in the industrial production index of the United States also fit neatly into this version of the IFI hypothesis. When the index is converted to roughly equivalent GNP terms, this relationship between the industrial production index and the balance of payments can be interpreted as stating that a one billion dollar increase in GNP will lead to a net inflow of approximately one hundred million dollars,

[11] In terms of proportions, this would be roughly 30 per cent.

[12] John Exter of First National City Bank has been perhaps the major proponent of this view.

ceteris paribus. This coefficient is almost identical with the coefficient found in Laffer [4]. It also strikes at the very heart of traditional policy and theory, insofar as an increase in domestic income improves the country's balance of payments. Also, in the earlier study it was found that an increase in domestic income causes a deterioration in the current account and an improvement in the capital account that more than compensates for the deterioration of the current account. These results are found here too.

Changes in the seasonally adjusted level of exports from the United States—changes in the level of foreign dollar transactions—are also found to be empirically relevant. Their relationship to net capital inflows approximates what might be expected. Foreigners hold approximately one-half a quarter's transactions in dollar balances. Naturally, increases in foreign dollar transactions are, on the average, greater than increases in American exports; but, similarly, increases in foreign dollar balances are, on the average, greater than the increases in their deposits in the United States.

The final variable, $Y_{US}\dot{r}$, is also statistically significant. The principal policy conclusion coming from this variable, as Despres, Kindleberger, and Salant state, is that one cannot really hope to use interest-rate policy as a tool for correcting the balance of payments.

All in all, it does not appear that this version of the IFI hypothesis is to be rejected as statistically insignificant, or as unimportant. The actual data and the theory mesh quite nicely, even without any lags.

To summarize, it is somewhat overwhelming, even to a fervent adherent of the classical theory of balance-of-payments adjustment, to see just how closely the hypothesis fits the actual data on a quarterly basis. During the period from the first quarter of 1958 through the fourth quarter of 1967, many environmental factors changed substantially, and these changes could conceivably have had a major influence on the balance of payments of the United States. Yet, one can scarcely find a ripple of their transitory effects, let alone any lasting ones.[13] These results were obtained without an intricate and complex econometric or theoretical structure. The model assumes that adjustment is instantaneous and that coefficients are linear as well as identical across nations, and it includes a mere handful of variables. None-

[13] See Cooper [1] and Laffer [3].

theless, the hypothesis it represents appears to be relevant from an empirical point of view.

The conclusions from a classical analysis of the balance of payments warrant far more attention than they have been getting. Deficits need not imply disequilibrium in any meaningful sense of the word, and there is no evidence that they do. Lack of confidence in the dollar does, perhaps, represent a misunderstanding of the world economy and not any true weakness of the dollar. Policy, unless extreme, appears to have had little, if any, effect on the balance of payments. Finally, supplying external as well as internal liquidity is well within the powers of a private capital market.

APPENDIX: THE DATA

Date	K_{US} (1)	$X - M$ (2)	$\dot{M}S$ (3)	ΔXSA (4)	$\dot{Y}_{US}$ (5)	$\dot{Y}_F$ (6)	$Y_{US}\dot{r}$ (7)
58-I	−232	107	−6.50	−532	−4.5	−.4	.347
58-II	−934	89	1.90	57	3.8	−.4	−3.897
58-III	175	−325	2.10	32	3.9	1.1	−3.684
58-IV	−243	63	7.10	−46	4.2	1.0	1.031
59-I	546	−559	−4.80	−142	4.4	3.1	−11.200
59-II	600	−697	.60	32	5.1	2.7	−6.276
59-III	878	−825	.80	438	−5.9	3.2	8.418
59-IV	−144	−171	2.90	−3	5.5	5.6	−4.647
60-I	31	41	−5.90	382	1.0	−1.3	−7.230
60-II	−77	292	−1.10	258	−.9	4.5	.038
60-III	−609	14	1.90	198	−1.8	.9	4.176
60-IV	−1998	1260	4.20	22	−4.2	2.1	9.674
61-I	−958	971	−3.90	139	.2	1.6	−4.179
61-II	−845	746	.50	−250	7.1	2.1	−9.131
61-III	600	79	1.80	285	1.1	1.1	.398
61-IV	−1358	1080	6.30	187	3.6	3.2	1.700
62-I	−491	462	−4.60	−76	1.4	.7	−6.409
62-II	−256	866	−.40	435	1.6	.9	−2.380
62-III	−948	41	.60	−40	1.2	2.5	−.861
62-IV	−1030	918	6.60	−75	−.7	−.2	7.447
63-I	−241	670	−4.00	−62	2.2	1.0	−6.800
63-II	−351	953	.70	567	4.2	4.7	−4.411
63-III	−64	−110	2.30	58	−.1	2.8	2.418
63-IV	−1082	1490	6.70	397	1.4	4.1	5.019
64-I	−1382	1700	−4.40	554	2.2	4.1	−7.129
64-II	−1166	1330	.50	−96	2.6	.3	−2.582
64-III	−330	653	3.70	338	2.4	1.7	.902
64-IV	−1239	1940	6.90	186	4.1	3.3	2.093
65-I	−1583	1080	−5.10	−765	2.6	1.3	−8.188
65-II	−818	1340	.60	1400	2.0	3.1	−1.659
65-III	−64	249	3.60	−115	.8	1.8	2.706
65-IV	−1260	1390	8.90	36	5.2	2.0	2.990
66-I	−945	825	−4.20	408	5.0	5.6	−9.983
66-II	−173	699	.80	117	2.8	.4	−2.257
66-III	668	−449	1.10	267	1.2	2.5	−.193
66-IV	−739	1080	6.10	147	1.8	1.5	4.163
67-I	−1096	721	−3.90	312	−3.1	.4	−.483
67-II	508	564	2.40	6	−.8	1.7	3.279
67-III	1313	−425	4.10	136	1.2	3.9	2.756
67-IV	−63	831	8.80	−17	5.2	8.0	2.884

(*continued*)

SOURCES:

Column 1. Net capital flows in millions of dollars is the sum of (a) "Transactions in U.S. Private Assets (net)," line 32 of "U.S. International Transactions," table 1, page 31 of the *Survey of Current Business*, September, 1968; (b) "Transactions in Foreign Assets in the U.S.," line 50 of the above table; and (c) "Errors and Omissions," line 60 of the above table, and previous issues of the *Survey of Current Business*.

Column 2. Current account in millions of dollars is the balance on goods, services, and unilateral transfers (net), line 31 of "U.S. International Transactions," table 1, page 31 of the *Survey of Current Business*, September, 1968, and previous issues. This account may also be obtained by the summation of the balance on goods and services, line 23, and unilateral transfers (net), line 25 of the above table.

Column 3. Money supply, defined as the total of demand deposits and currency, is from "Money Supply and Related Data," page A-16 of the *Federal Reserve Bulletin*, February, 1968, and previous issues. Quarterly changes were calculated from "not seasonally adjusted" end-of-quarter figures. These data are in billions of dollars.

Column 4. Seasonally adjusted exports of goods and services (excluding transfers under military grants) in millions of dollars is line 2 of "U.S. International Transactions—Seasonally Adjusted," table 2, page 32 of the *Survey of Current Business*, September, 1968, and previous issues. Quarterly changes were based on these end-of-quarter figures.

Column 5. Index of Industrial Production (U.S., 1957–59 = 100) is from the *Federal Reserve Bulletin*, Industrial Production S.A., February, 1968, page A-52, and previous issues. Quarterly changes were based on these end-of-quarter figures.

Column 6. Index of Industrial Production (Foreign, 1957–59 = 100) is a composite index with a weighting based on dollar GNP of the included countries for the period 1957–59. The data for the individual indices are from Appendix Section C: "Historical Data for Selected Series," *Business Conditions Digest* (previously *Business Cycle Developments*), Department of Commerce, Bureau of the Census, December, 1969. OECD, Europe, and Canada are on page 105; and Japan is on page 107. The composite index was calculated on a quarterly basis and quarterly changes were derived from these figures for ends of quarters.

Column 7. Quarterly change in velocity, standardized for income, is identical to the quarterly change in the ratio of Index of Industrial Production (U.S.) to the level of money supply, multiplied by the Index of Industrial Production. See above, paragraphs 3 and 5, for the sources.

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COMMENTS

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The papers by Salant and Laffer on international financial intermediation (IFI) are of current interest. Balance-of-payments statistics reveal this country to have been in an almost continuous deficit position for the past two decades. In the first part of this period, the deficits were welcomed by most economists, owing to the "dollar shortage" in foreign countries. More recently, the deficits have been viewed with great concern by most economists, owing to the "dollar glut" abroad.

The examination of IFI may well be the most important recent development in the field of international economics. The examination was first carried out by Kindleberger in his pioneering article of 1965.[1] It was expanded and refined by Despres, Kindleberger, and Salant in their 1966 article.[2] Since that time, there has been much discussion of IFI.[3] In their papers, both Salant and Laffer continue this timely discussion.

Salant's paper examines the IFI hypothesis, pointing out that much of the criticism advanced against it is invalid. In addition, he argues that other parts of the criticism do not necessarily disprove this theorem.

Laffer, in his paper, seeks to formalize the hypothesis so that its implications can be systematically derived. In addition, he seeks to

NOTE: I was at the University of California, Los Angeles, when this material was prepared. My thanks go to Benjamin Klein for many helpful discussions on the subject.

[1] Charles P. Kindleberger, "Balance-of-Payments Deficits and the International Market for Liquidity." *Essays in International Finance*, No. 46. Princeton, International Finance Section, 1965.

[2] Emile Despres, Charles P. Kindleberger, Walter S. Salant, "The Dollar and World Liquidity—A Minority View." *Economist*, February 5, 1966, pp. 526–529. Reprinted by The Brookings Institution, Washington, April, 1966.

[3] See, for example, Lawrence H. Officer and Thomas D. Willett, eds., *The International Monetary System*. Englewood Cliffs, N.J., Prentice-Hall, Inc., 1969, Part II, Section A; and George N. Halm, "International Financial Intermediation: Deficits Benign and Malignant." *Essays in International Finance*, No. 68. Princeton, International Finance Section, 1968.

test it. Laffer points out that his results tend to support the IFI hypothesis, while not necessarily disproving alternative hypotheses.

The inconclusive nature of the results of the empirical studies would appear to be, in part at least, attributable to the imprecise nature of what, in fact, the IFI hypothesis is. From Section 2 of Salant's paper, I would guess that what Salant has in mind are, among other things, the possible explanations of why IFI occurs. An examination of Laffer's introductory comments on what the hypothesis points out also raises some question as to what it is. Each of the statements is in a sense correct, but also in a sense incorrect, or at least, imprecise.

Salant's discussion of both what is entailed by IFI, and what its effects are, is very interesting and potentially very useful. If the nature and effects of IFI could be clarified, empirical implications could probably be more easily obtained. At that point, empirical studies would probably be more productive than they appear to be at present. In contrast to the 1966 article, the policy implications of Salant's paper appear to be well stated. In the earlier article, the alleged compatibility of IFI with the existing international monetary system was unwarranted.

IFI differs from domestic financial intermediation in the entity taking part in the intermediation: domestically, the entity is a financial intermediary institution—a commercial bank, a savings and loan association, a mutual savings bank, a credit union; internationally, it is the United States as a whole. Thus, the United States may be engaged in IFI with, or without, the participation of what we consider a domestic financial intermediary institution.

IFI also differs from domestic financial intermediation in the nature of the assets purchased and issued: domestically, the assets purchased and issued are financial securities—equities or debt;[4] internationally, the assets may be real on one side of the transaction.[5] Thus,

[4] See, for example, John G. Gurley and E. S. Shaw, *Money in a Theory of Finance*, Washington, The Brookings Institution, 1960, pp. 94 and 192; and Joseph M. Burns, "The Relative Decline of Commercial Banks: A Note," *Journal of Political Economy*, Vol. 77, No. 1 (January/February, 1969), pp. 122–129.

[5] The broader definition of intermediation has interesting implications for the domestic economy. In particular, it would suggest that corporations may be regarded as intermediaries between real assets and financial assets. I am indebted to Raymond Goldsmith for helpful discussions on this point.

there would appear to be no reason why the financial outflows and inflows associated with IFI would have to be equal. To simplify the analysis, I shall assume that such financial flows are equal. This assumption is implicit in much of the discussion about IFI.

Financial intermediation is a type of financial innovation. Such innovations may be in direct, as well as indirect, finance. Necessary conditions giving rise to domestic financial innovations include the existence of finance costs facing borrowers and lenders. The finance costs are essentially twofold in nature: both transaction costs and uncertainty facing savers and investors (together with the assumption of risk aversion).

Financial innovations—direct or indirect—serve to reduce the finance costs of savers and investors, thereby bringing about a greater volume of saving and investment (on the assumption that both saving and investment are interest-elastic to some extent). Financial intermediaries are in a unique position to reduce these finance costs. The large size and diversity of their assets enables them to pool the real risk of savers; and the large size and diversity of the securities they issue enables them to pool the risk of illiquidity facing the savers.[6]

For IFI to take place, an additional factor must be added to the conditions stated above: differences in spreads as between liquid and illiquid assets in two countries or regions. Needless to say, there are infinite degrees of liquidity or illiquidity of an asset. Thus, the difference in spreads would have to refer to those found between assets of comparable liquidity.[7]

One important qualification of this point regarding the difference in interest-rate spreads should be mentioned—namely, that the costs entailed in IFI by the United States would have to be as great as they are domestically within the United States. If this were not the case, then IFI could take place even if spreads were identical. There does not appear to be any a priori reason why such a difference in costs would exist. It is, however, possible that differences in governmental

[6] These points are covered more fully in Joseph M. Burns, "On the Effects of Financial Innovations," *Quarterly Review of Economics and Business*, Vol. 11, No. 2 (Summer, 1971), pp. 83–95.

[7] If both the long-term and short-term assets in one country differed in liquidity from their counterparts in another country, the yield curves would not necessarily intersect.

regulations might enable financial intermediation to be carried out in a more efficient manner internationally by the United States than within our own country. If this were the case, then the qualification raised would be relevant.

The differences in spreads, as Salant suggests, may be attributed to a difference in either liquidity preference or the efficiency of finance—direct or indirect—between the two countries or regions. The difference in the efficiency of finance may, in turn, be attributed to a difference in either the market structure of the finance industry in the two countries (regions) or the efficiency of a given market structure. The empirical distinction between these latter cases is extremely difficult, owing to the problem entailed in separating the operating costs from the profits of a financial institution.[8]

There does not appear to be any a priori reason for the existence of such differences in liquidity preference. In addition, some empirical evidence appears to cast serious doubt on this explanation of the existence of IFI.[9] This is not to say that such differences may not exist. In this connection, it is of interest to note that Kindleberger, in his 1965 article, makes no mention as to why such differences should occur. Yet, these differences were the *raison d'être,* according to Kindleberger, of IFI. In the Despres-Kindleberger-Salant article of 1966, the only reference to why such a difference might exist is a statement that Europeans have had half a century of wars, inflations, and capital levies. Of course, in the 1966 article, the authors present two other explanations of why IFI might take place. In Salant's present article, again no mention is made of why such differences might exist.

As to differences in financial efficiency—both direct and indirect—there are strong reasons for believing the American financial structure to be more efficient than the European one. An appropriate explanation of this difference in financial efficiency would have to go into the factors affecting financial developments within a country. Suffice it to say here that financial developments in a country are affected,

[8] Cf. Joseph M. Burns, "An Examination of the Operating Efficiency of Three Financial Intermediaries." *Journal of Financial and Quantitative Analysis.* Vol. IV, No. 5 (January, 1970), pp. 541–558.

[9] See Salant's references to Lamfalussy's writings. Also cf. Richard N. Cooper, *The Economics of Interdependence: Economic Policy in the Atlantic Community.* New York, McGraw-Hill, 1968, Chap. V.

among other things, by the nature and level of a country's real development.[10]

In any event, if a difference in interest-rate spreads did exist, there would be an incentive for IFI to take place. As Salant points out, once IFI takes place, the difference in interest-rate spreads, when comparing the two countries, is likely to be reduced—and, in the extreme case, eliminated.

As suggested earlier, foreigners will benefit by the IFI of the United States via the reduction in the finance costs of both its savers and investors. In this way, the level of saving and of investment will be enhanced (on the assumption made earlier about the interest-elasticity of these two schedules). For this reason, as Salant points out, the criticism advanced by Halm that IFI is a "monetary veil" is invalid.

As for the United States, we will benefit by earning a return in our role as international financial intermediator. Costs, however, are also likely to be present. They will, in fact, be present if the United States desires to retain its present rate of exchange, and if an increase in the volume of IFI serves to diminish foreigners' confidence in the ability of the United States to retain that rate, thereby putting pressure on it. A corollary of the above point is that costs may well be present if the United States wishes to retain an independent monetary policy. In addition, it is interesting to note that if benefits and costs exist for the United States, a particular amount of IFI will be optimal.

In closing, let me comment very briefly about some implications of IFI carried out by the United States. First of all, as Salant and Kindleberger, among others, have suggested, existing definitions of the balance-of-payments position of a country—including the "liquidity" and "official-transactions" ones—do not necessarily indicate whether or not the country is in international-payments equilibrium.[11] A mean-

[10] See, for example, John G. Gurley and E. S. Shaw, "The Growth of Debt and Money in the United States, 1800–1950: A Suggested Interpretation." *Review of Economics and Statistics,* XXXIX (August, 1957), pp. 250–262; John G. Gurley, "Financial Structures in Developing Economies," in D. Krivine, ed., *Fiscal and Monetary Problems in Developing States.* New York, Praeger, 1967; and Richard N. Cooper, *The Economics of Interdependence: Economic Policy in the Atlantic Community.* The Atlantic Policy Studies. New York, McGraw-Hill, Inc., 1968, Chap. V.

[11] Cf. C. P. Kindleberger, "Measuring Equilibrium in the Balance of Payments." *Journal of Political Economy,* Vol. 77, No. 6 (November/December, 1969), pp. 873–891.

ingful criterion of the international-payments position of the United States would appear to be the existence and magnitude of pressure on the exchange rate of the United States dollar.

Secondly, the degree of confidence in the dollar would not necessarily be related solely to the ratio of international reserves of the United States to its liquid liabilities to all foreigners or to official foreigners.[12] Indeed, for a given degree of confidence, this ratio might be expected to diminish, the larger the size of the liquid liabilities—as well as the longer the time period in which the United States maintains the international value of its currency. The first expectation is based on an application of the law of large numbers (as well as an implicit assumption regarding the average size of liability); the second expectation, on the assumption that a learning process about the liquidity of the dollar would enhance foreigners' confidence in it.

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Walter Salant has provided us with a useful and stimulating review of the controversy that has been generated by certain views advocated by Despres, Kindleberger, and himself, which he labels the hypothesis of International Financial Intermediation (IFI). This hypothesis has been given a variety of interpretations, and Salant himself is concerned with several, though it is not always altogether clear which particular interpretation is being defended at any one point.

One interpretation suggested by the title is that the IFI hypothesis consists of the proposition that "IFI behavior" by a country can explain its exhibiting an enduring deficit in its balance of payments. In this connection, "IFI behavior" is defined in Section I as the simultaneous expansion of a country's foreign assets and of its liabilities to foreigners. Initially, only financial assets are explicitly included in this definition, but, at a later point, it is suggested that tangible assets (direct

[12] Cf. Benjamin Klein, "The Competitive Supply of Money," *Journal of Money, Credit, and Banking*, forthcoming.

investment) should be included too. Furthermore, a balance-of-payments deficit is defined as either a "liquidity" or an "official-settlement" deficit. As long as we confine ourselves to the liquidity definition, I cannot see how anyone could seriously argue against this very broad interpretation of the IFI hypothesis, for it strikes me as little more than a tautology. Clearly, the simultaneous expansions of assets and liabilities will account for an expansion of liabilities and can account, in particular, for an expansion of liquid liabilities, or a liquidity deficit. Since it is an undisputed fact that the United States did exhibit IFI behavior in the relevant period, it is hardly surprising that Salant should conclude again and again that no argument set forth by the critics could reject this interpretation of the IFI hypothesis as applied to the United States. However, the criticism was actually concerned with other interpretations, some of which are reviewed below.

One such interpretation construes the essence of the IFI hypothesis as postulating that the IFI behavior of the United States reflects intermediation, in the narrower sense of intervening between primary lender and final borrowers of foreign countries, either directly through specialized institutions or indirectly through the operation of markets. This is a substantive hypothesis, for the observed IFI behavior could have occurred without strict intermediation, as Salant acknowledges at the beginning of his discussion of "Alternative Theories of Enduring Deficits" in Section 2. Indeed, with the dollar used both as a measure and a medium of exchange in international transactions, one might expect that an expansion of trade would lead foreign transactors to increase the stock of short-term dollar claims. Since the United States was also a net exporter of capital, it follows that both its assets and liabilities might have been expected to rise in any event. In fact, one might expect that many other developed countries would, on balance, also exhibit IFI behavior. Hence, whether the IFI behavior of the United States reflected to a significant extent strict intermediations, because of differences in liquidity preferences or because of the greater efficiency of its financial institutions, is an interesting empirical question. Unfortunately, after an extensive examination of the arguments and the available facts, Salant has to admit that the evidence is so far inadequate for a reliable answer, and I can only associate myself with this conclusion.

A third and much bolder interpretation, which the authors themselves have felt it appropriate to qualify, is that for an IFI country, and for the United States in particular, an enduring deficit does not imply any real imbalance but is instead a healthy symptom of growth and hence should not be a source of concern. In my view, while this position is substantially valid—at least as a first approximation—in the case of a conventional financial intermediary, there are some real pitfalls in extending it by analogy to an IFI country and to the United States in particular. The point is that a conventional financial intermediary (with appropriate qualification for the central bank and, to some extent, the banking system) can expand its assets only within limits set by the need of finding willing holders of its liabilities. As long as it can find such holders, there may well be little ground for concern regarding the rate at which its liabilities expand. But these limits do not apply to the United States, since an increase in its liabilities to foreigners in excess of what the foreign private sector would wish to hold must, at least in the first instance, be absorbed by the central bank in order to maintain the fixed parity. Accordingly, the analogy with financial intermediaries and the implication that one need not be concerned with the rate of increase in liabilities has some validity as long as the increased liabilities are *willingly* held by private foreign holders, i.e., as long as there is *no deficit on the official-settlements basis*. It follows that the size of the deficit on the liquidity basis may not per se be worthy of much attention. This is an implication of the IFI hypothesis on which Despres-Kindleberger-Salant have justifiably laid great stress, though it must be recognized that many others reached the same conclusion without recourse to the IFI hypothesis. This view is, by now, largely accepted for the United States, while other countries have long relied on a different definition of deficit—typically, the basic balance, which involves the increase in net rather than gross, short-term liabilities.

But, for the reasons put forward above, the conclusion that in employing an analogy with conventional financial intermediation, one need not be concerned with the rate of growth of liabilities or the size of the deficit, loses much of its validity when it comes to the official-settlements deficit. This does not mean that any continuing deficit on official settlements is *ipso facto* an indication of balance-of-payments

disturbances that need to be corrected. Such a deficit does mean that the strength of the dollar on foreign-exchange markets is being maintained through central-bank intervention, and in this sense, it might be taken as prima facie indication of difficulties; however, for a variety of reasons, it is not conclusive evidence.

On the one hand, some expansion of dollar reserves by foreign central banks may be appropriate, depending on the nature of prevailing arrangements with respect to reserve assets and their growth. On the other hand, one cannot safely infer that the deficit is of a bearable size from the mere fact that the foreign central banks are absorbing these deficits in their dollar reserves, when this result is achieved through the exercise of a variety of pressures (so-called unwilling holding). Again, the official-settlements deficit may hide the extent to which the dollar is being supported by central-bank operations, owing to the practice of some foreign central banks of reducing their direct holdings of dollar assets reserves by lending them to their commercial banks, which, in turn, hold dollar assets. Since these are recorded as private holdings, they do not appear in the official-settlements deficit. Last but not least, a strong current showing on an official-settlements basis, while it is an indication of current strength, may not necessarily imply a healthy state of affairs if, as in recent times, it results from a large volume of short-term borrowing and volatile foreign financial investments, accompanied by a weak current account.

Nonetheless, all of the above qualifications do not change the basic conclusion that, beyond some point, a deficit on an official-settlements basis will become excessive, a conclusion with which Salant would presumably not disagree, as is apparent from his final remarks. Unfortunately, it also is clear from these remarks that the IFI hypothesis, however interpreted, cannot be of much help in identifying just where that border line lies.