

PRINCETON STUDIES IN INTERNATIONAL FINANCE NO. 19

International and Interregional
Payments Adjustment:
A Synthetic View

Marina von Neumann Whitman

INTERNATIONAL FINANCE SECTION

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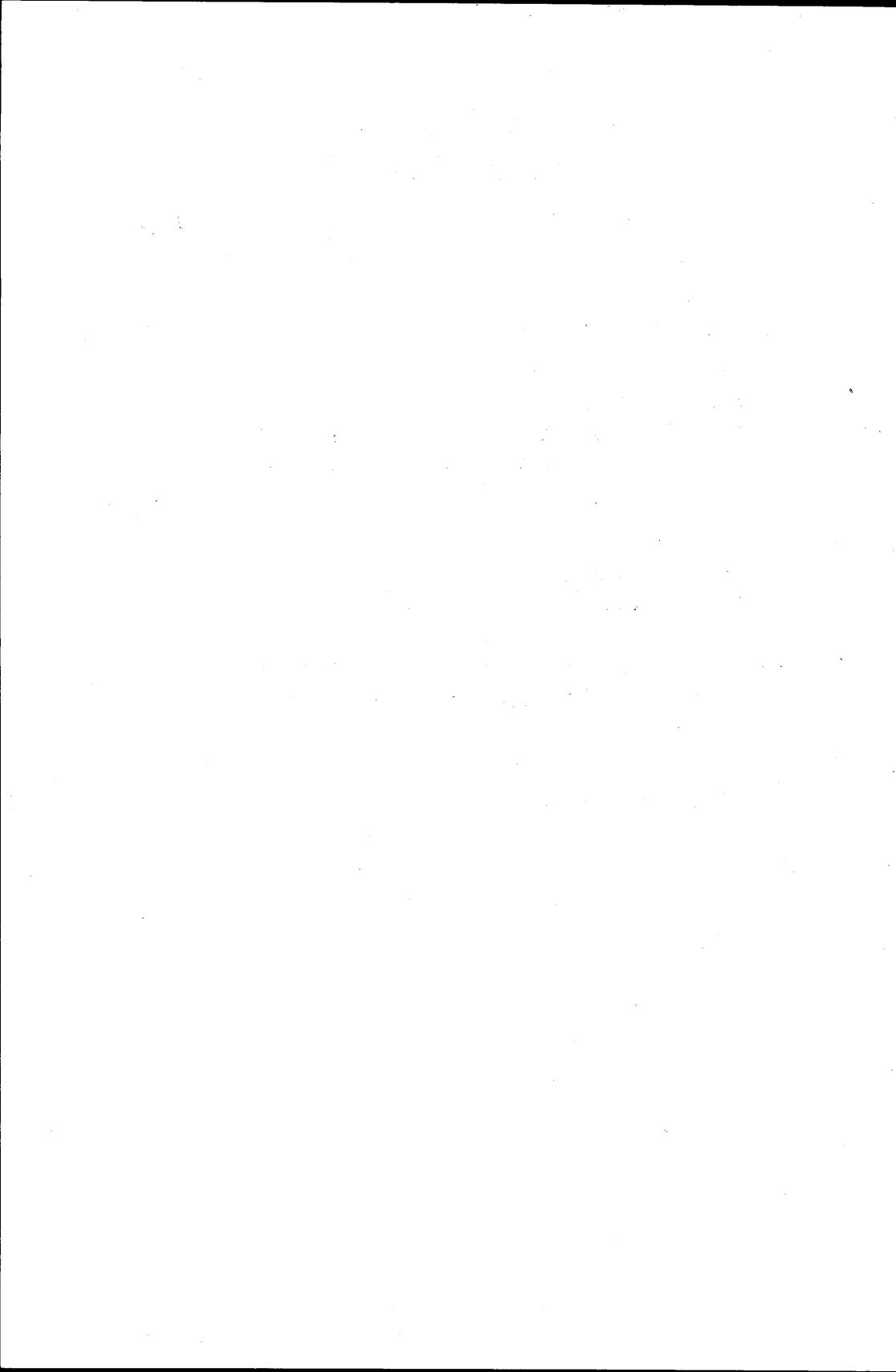
INTERNATIONAL FINANCE SECTION
DEPARTMENT OF ECONOMICS
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INTERNATIONAL AND INTERREGIONAL PAYMENTS ADJUSTMENT: A SYNTHETIC VIEW*

I. INTRODUCTION

Much has been written in recent years on the nature of the balance-of-payments adjustment process among very open, closely integrated economies. Different writers have stressed different facets of openness: Hartland, Ingram, and McKinnon and Oates have placed primary emphasis on the responsiveness of accommodating capital movements; Mundell, and Borts and Stein on the role of complementary autonomous flows of labor and capital; Meade and Kenen on the effects of economic policy integration.¹ Taken together, these discussions offer for consideration a number of important relationships between the "international" and the "interregional" adjustment processes.

The aim of this study is to carry the synthesis a step further, and particularly to investigate the crucial role which capital flows play in the balance-of-payments adjustment process of all highly open economies, be they regions or nations. In particular, it stresses the relevance for such economies of a "common-cause" theory of external adjustment. This view postulates that major changes on current and on long-term

* The author's thanks to Peter B. Kenen for his assistance extend far beyond the conventional acknowledgement; his encouragement brought this paper into being, and his advice and perceptive criticism have transformed virtually every page. She is also grateful to Mark Perlman, Walter S. Salant, and to Donald B. Keesing and other members of the Workshop in International Economics at Columbia University for their helpful comments on earlier drafts.

¹ The writings referred to are: Penelope Hartland, "Interregional Payments Compared with International Payments," *Quarterly Journal of Economics*, Vol. 63 (August 1949), pp. 342-407; James C. Ingram, "State and Regional Payments Mechanisms," *Quarterly Journal of Economics*, Vol. 73 (November 1959), pp. 619-632; Ronald I. McKinnon and Wallace E. Oates, *The Implications of International Economic Integration for Monetary, Fiscal and Exchange-Rate Policy*, Studies in International Finance No. 16 (Princeton, N. J.: International Finance Section, 1966); Robert Mundell, "A Theory of Optimum Currency Areas," *American Economic Review*, Vol. 51 (September 1961), pp. 657-665; George Borts and Jerome Stein, *Economic Growth In A Free Market* (New York: Columbia University Press, 1964); James E. Meade, "The Balance of Payments Problems of A European Free Trade Area," *Economic Journal*, Vol. 67 (September 1957), pp. 370-396; Peter B. Kenen, "Toward A Supranational Monetary System" (February 1966, mimeo).

capital account, rather than bearing a cause-and-effect relationship to one another in either direction, often stem from a common cause. Specifically, the common cause stressed in this discussion consists of shifts in the marginal efficiency of capital (MEC) in the export sector which arise primarily from changes in the demand schedule for exports. In contrast with the conventional Keynesian formulation, this approach takes into account the effects of capital flows on capacity and output as well as on income, and therefore on exports as well as on imports. An interesting implication of the "common-cause" hypothesis, when applied to open economies whose major disturbances are likely to arise in the export sector, is that export-led growth and prosperity (or decline and depression) may be accompanied *either* by surpluses or by deficits on current account, depending on the values of certain key parameters.

The first step in this attempted synthesis of the international and interregional adjustment mechanisms is a consideration of the nature of economic "openness," and in particular of the extent to which its attributes depend upon political sovereignty, the crucial distinction between a region and a nation. The nature of disturbance and response in an open economy is first examined in a "Keynesian" framework, which focuses on the adjustment of the balance of *trade* rather than the balance of *payments*. Capital flows are then introduced explicitly into the adjustment process, both in terms of the various financing mechanisms provided by short-term flows, and in terms of the contribution to ultimate adjustment made by long-term capital flows which take place in response to the MEC shifts mentioned above, and which are likely to be accompanied by complementary movements of labor in the same direction. A detailed, although entirely hypothetical, description of the processes of export-led growth and export-led decline serves to bring out the major implications of the common-cause hypothesis for open economies. Some of these implications are at variance with the conclusions derived from the more conventional view of balance-of-payments adjustment. In concluding, this study recognizes the existence, and examines some of the implications for public policy, of some important asymmetries in the processes of export-led growth and export-led decline. These asymmetries are obscured by the formal presentation of the open-economy adjustment process, but they are crucially important none the less, in view of the increasing awareness, at the regional as well as the national level, of the heavy social costs

involved in the stagnation or outmigration of productive factors associated with economic decline.

Several developments since World War II have further weakened the already shaky empirical foundations which underlie a rigid distinction between the carefully delineated and much-discussed international adjustment mechanism, and the adjustment process between regions of a single country, about which far less is known and which is often assumed to take care of itself. One such development is the increasing stress placed by many of the high-income industrialized nations on regional as well as national prosperity. We are no longer willing to abandon lagging regions to massive outmigration and to stagnation of resources unable or unwilling to move. It is not enough that the United States as a whole has the world's highest median family income if Appalachia does not share to an acceptable extent in the national prosperity; the rapid growth rate of the Italian economy will not be satisfactory if the Mezzogiorno is allowed to lag too far behind. And this concern for regions as economic entities in themselves, which makes massive labor movements an unacceptable form of adjustment for deficit regions, has compelled the application of "international" analysis to interregional problems.

Even more important, perhaps, is the emergence of the European Common Market and the development, throughout the world, of embryonic multinational groups which hope to follow in its footsteps. As these regional blocs move toward increasing economic integration, the nations comprising them will inevitably shed some of their national economic attributes and behave, in their relationships with their partners, more and more like regions.

Finally, the search for a world monetary system that will permit nations to minimize the conflict between internal and external balance without resort to protectionist restrictions on the international flow of goods and factors of production has focused new attention on the international balance-of-payments adjustment process itself. In the effort to describe the adjustment process as it actually operates in the real world, the traditional assumptions about international factor immobility are being relaxed, and economists have begun to explore anew the interrelationships between internal economic activity and external adjustment in economies far more open to external influence than those described by the classical and neoclassical writers.

II. THE OPEN ECONOMY

The Nature of Economic "Openness"

Relatively open economies differ from relatively closed ones both in the sources of the disturbances which impinge on them and in the nature of their responses to these disturbances. Because an open economy is heavily dependent on the foreign-trade sector, in the sense that exports and imports represent a relatively large proportion of total income, external shocks will represent a major source of disturbance. That is, fluctuations in exports will tend to be large relative to fluctuations in domestic investment as sources of disturbance to the domestic economy. Such disturbances to the export sector may be of a macro-economic nature, originating in changes in the level of income abroad, or they may arise from such structural shifts as changes in foreign tastes or technology.²

"Open" economies are distinguished from relatively "closed" and autarkic systems not only by the fact that the disturbances which impinge on them are more likely to originate beyond than within their borders, but also by their vulnerability to such disturbances, a vulnerability which stems from limitations on the range of policy responses available to them. One factor which makes a crucial difference in this respect is political sovereignty. A region that has no authority to erect tariff or other barriers to external trade, to control movements of capital across its borders, to determine the size of its own money supply, or to exercise an independent fiscal policy³ will inevitably be more sensitive to external shocks than a nation which may avail itself of any one of these instruments in order to make its external receipts and expenditures balance or to bend its external trading and financial relationships to serve the cause of internal stability. This distinction between nation and region in terms of political autonomy is one that must be borne in mind, however open a national economy may be in other respects, as long as economic unions lack significant supranational authority in the economic sphere.

None the less, although political autonomy may be a necessary condition for internal rather than external influences to dominate the

² Disturbances in the export sector can also originate internally, in the form of domestic technological or other changes which shift the supply curve of exports.

³ See Kenen, *op. cit.*, pp. 8-9, for a more detailed discussion of the limitations on the fiscal powers of sub-national governments.

level of economic activity, it is not a sufficient one. Building on earlier work by Mundell, McKinnon and Oates have demonstrated in a recent monograph that, if one assumes (a) the maintenance of fixed exchange rates, (b) the existence of a large stock of perfectly mobile and generally acceptable financial assets, and (c) the desire of individuals to maintain "portfolio balance" (a fixed ratio between income and assets at a given rate of interest) in terms of these assets, it will be impossible for the government to affect the level of domestic economic activity through either monetary or fiscal policy. Under these assumptions, attempts by the government to affect the supply of money by purchases or sales of securities would simply result in an altered mix of domestic and foreign securities in private portfolios, with no change in the interest rate or the money supply. Attempts to achieve similar effects through surplus or deficit spending would be drained off in surpluses or deficits in the balance of trade with the outside world.⁴ Despite the rigidity of the assumptions, the general point implied by this analysis is important: the free flow of interest-sensitive capital across national boundaries is likely to emasculate the effect of government financial policies on the level of income and employment. This diminution of the influence of domestic economic policy has two implications: errors in such policy become less important as a source of disturbances to the domestic economy, but at the same time government stabilization policy is rendered less effective in offsetting disturbances which originate abroad.

Apart from the question of political sovereignty, then, economic openness is characterized by a heavy dependence on the foreign-trade sector, implying that fluctuations in the export sector will be more important than fluctuations in the levels of autonomous domestic expenditures as sources of disturbance to the domestic economy, and by a high degree of capital mobility across regional, or national, boundaries, which weakens the power of government financial policies to combat external disturbances. One implication of these various facets of openness, taken together, is that an open economy can have no independent business cycle, since changes in its real-income level will be dominated by the position of its trade balance with the outside world. A different, but related, implication is that all disturbances to the economy, wherever they originate, will tend to "spill over" into the balance of payments through either the current or the capital account or both. In fact, some writers have elevated this implication itself to the status of a

⁴ McKinnon and Oates, *op. cit.*, pp. 4-6.

definition. Triffin and Grubel, for example, define economic openness in terms of the extent to which inflationary or deflationary disturbances to the economic system "spill out" directly into the balance of payments, rather than expending their forces on domestic prices and output, as they would have to in a completely closed economy.⁵

Domestic Income and the Trade Balance

In terms of Keynesian multiplier analysis, the degree of openness has very definite implications for the relationship between an economy's domestic-income level and its trade-balance position. These implications stem from the preoccupation of multiplier analysis with the behavior of the current account; a major concern of this paper will be to show how they are modified when we consider the interrelationships between the current and capital accounts. But first, to see what these implications are, the point of departure is the fact that, in the familiar multiplier framework, autonomous changes in domestic spending ("internal" disturbances) will have the same effect on the domestic economy as autonomous changes in exports ("external" disturbances) of the same magnitude and in the same direction, but the two types of disturbance will lead to exactly opposite changes in the trade balance.⁶ Thus, if the initial disturbance is in the foreign-trade sector, the Keynesian formulation implies a coincidence between inflationary pressure and current-account surplus, and between deflationary pressure and current-account deficit. If, on the other hand, the initial disturbance takes the form of an exogenous change in some component of domestic expenditure, a prosperity-cum-deficit or recession-cum-surplus syndrome is implied.

This line of reasoning suggests that open economies, where disturbances originating in the foreign-trade sector dominate those arising from fluctuations in domestic expenditures, should experience coincidences of depression and deficit or of prosperity and surplus more often than relatively closed economies less sensitive to changes in the outside world. One can see why this is so by focusing on regions of a single country, which generally lack any significant degree of economic autonomy and whose economies are heavily dependent on the well-being of their export industries. There are at least two reasons why such regions are unlikely to experience internal boom with external

⁵ Robert Triffin & Herbert Grubel, "The Adjustment Mechanism to Differential Rates of Monetary Expansion among the Countries of the OEEC," *Review of Economics and Statistics*, Vol. 44 (November 1962), pp. 486-491.

⁶ Kenen, *op. cit.*, pp. 4-5.

deficit, or depression with surplus. One is that such a situation most often reflects an underlying monetary disturbance;⁷ it is likely to originate either in differential rates of monetary expansion among countries, creating different degrees of inflationary pressure on the demand side, or from differing degrees of "cost-push" inflation. This type of disturbance has been quite common among nations in recent years, as a result of governmental efforts to stimulate or maintain full-employment production levels under conditions of downward inflexibility of wage rates. But it is much less likely to occur among regions of the same country, which lack the power to stimulate monetary expansion through credit creation, and among which the scope for relative-cost changes is much more limited in the short run.

Even apart from monetary disturbances, one might logically expect a relatively self-sufficient nation's exports to decrease during booms and increase during slumps. Changes in relative prices, affecting the competitive position of a nation's exports adversely during booms and favorably during recessions, and the possibility that during periods of inflationary pressure potential exports will be bid away by internal demand are two of the more obvious factors tending in this direction. But this kind of reasoning assumes a chain of causation running from changes in the domestic economy to changes in the export sector. In regions, or in small nations where autonomous fluctuations in exports are large in comparison with fluctuations in investment or in other autonomous components of domestic expenditure, the chain of causation will more probably run the other way, from the external sector to the domestic economy. And in such instances a deterioration in the trade balance will contribute heavily to a general slump; conversely, an export increase leading to a current-account surplus will contribute heavily to internal prosperity. For at least two reasons, then, we might expect that regional or very open national economies will tend to experience concomitant expansion or contraction in net exports and in the domestic economy, whereas the opposite pattern is more likely to prevail among more autarkic economic units. Insofar as this implication is not borne out by observation, we must look outside the framework of simple multiplier analysis for an explanation. The model described in this paper is an attempt to do just that.

⁷ For the argument that any sustained imbalance of payments must be essentially monetary in nature, see: Harry G. Johnson, "Towards a General Theory of the Balance-of-Payments," in *International Trade and Economic Growth* (Cambridge, Mass.: Harvard University Press, 1958).

The Processes of Adjustment in an Open Economy

For several reasons, then, the origin and transmission of exogenous disturbances are likely to vary with the degree of openness of a particular economy. In addition, the processes of adjustment which take place in response to these disturbances are likely to be somewhat different in a relatively open than in a relatively closed economy. For one thing, regional economies within a single country tend to have higher marginal propensities to import than more self-sufficient national economic units. The marginal propensity to import for consumption is generally large both because domestic final output is not highly diversified, producing a large direct demand for imported goods, and because this output itself has a large import content, implying a substantial indirect demand as well. If the marginal propensity to import for investment purposes is considered separately, it is likely to be even larger, since the indirect requirements for imports are characteristically highest in the capital-goods sectors.

Where economic disturbances are typically internal in origin, a high marginal propensity to import will exacerbate the resulting balance-of-payments difficulties, since a relatively large portion of the initial income change will spill over into the current account. But for an open economy, whose domestic-income level is dominated by external shifts transmitted through the current account, such a high import propensity will greatly facilitate the process of adjustment. For, the larger the marginal propensity to import, the smaller is the change in income and total expenditure required to bring about a given change in imports and thus effect adjustment to a given initial disturbance in the trade balance. And, of course, the more powerful this "income effect" in balance-of-payments adjustment, the smaller will be the observed income shifts which take place in response to an external disturbance.

However large the marginal propensity to import, complete balance-of-payments adjustment can never be effected through the multiplier effects on income and imports alone in any economy in which the marginal propensity to save is greater than the marginal propensity to invest.⁸ In such instances, price changes will come into play to help complete the adjustment process. And, as in the case of income shifts, observed shifts in relative prices among regions of a single country are likely to be small just because the price effects themselves are very

⁸ The model presented here can effect a full adjustment by what amounts to a violation of this condition: the appearance, in the process of adjustment, of changes in the level of investment (ΔI) induced by changes in the level of exports (ΔE).

large. There are a number of reasons to expect the trade balance to be highly responsive to small price differences among the regions of a single country with a well-integrated industrialized economy, such as the United States. The absence of legal or cultural trade barriers and the production and marketing of a wide variety of goods by interregional corporations with nationwide pricing policies greatly reduce the scope for price differentials to arise in product markets. And the development of nationwide bargaining by major labor unions, the increasing mobility of labor at all levels as transportation and communications improve, and the growth of a highly integrated national capital market all serve to reduce the scope for such price shifts in factor markets. In short, the high mobility and wide availability of both goods and factors of production all serve to increase price elasticities of both demand and supply among closely-integrated economies, and thus to make a region's trade balance highly responsive to small price shifts.

III. THE ROLE OF CAPITAL FLOWS

Because factors of production are highly mobile and responsive to differences in the rates of return among very open or integrated economies, factor flows themselves play a major role in the open-economy adjustment process, quite apart from their effect on elasticities of supply. We cannot, therefore, continue to ignore the capital account by assuming that disturbances to the domestic economy and the responses leading to external adjustment both operate through the current account alone. The classical and Keynesian theories on which the discussion so far has been based are fundamentally theories of balance-of-trade adjustment, whereas the importance of factor flows, particularly of capital, among open economies requires that we consider the question of balance-of-payments adjustment instead. This is particularly true because for such economies, as we shall see later, it is often impossible to separate effects on the current account from those on the capital account; shifts in trade flows and in financial flows often stem from common causes.

Short-Run Financing

The most obvious, and trivial, instance of simultaneous and offsetting shifts in the current and the capital account are capital flows which take the form of trade credits, that is, either supplier or domestic-bank financing of exports. Such capital movements are "equilibrating" in the narrow sense in which Kindleberger originally introduced the term; that is, they fluctuate directly with the trade flows they are financing.⁹ They therefore represent a highly sensitive cushioning device, limiting the reserve changes which would otherwise result from uncompensated fluctuations in the trade balance. Although we do not have direct data on the importance of such trade credits in interregional capital flows, we do know that they form a significant proportion of the capital account for the United States as a whole. Bell estimated that, in 1960-61, between 75 and 80 per cent of all short-term capital outflows from the United States were for the purpose of financing American exports.¹⁰ And, in view of the fact that some of the remaining 20-25

⁹ Charles P. Kindleberger, *International Short-Term Capital Movements* (New York: Augustus M. Kelley, 1937, 1965), Ch. 1.

¹⁰ Philip W. Bell, "Private Capital Movements and the U.S. Balance-of-Payments Position," in U.S. Congress, Joint Economic Committee, *Factors Affecting the*

per cent probably consisted of speculative capital movements which do not take place among regions of a single country, we might expect the proportion to be at least as high, if not higher, in interregional transactions.

The role of such "equilibrating" capital movements becomes particularly important to the extent that the trade of highly integrated economies is dominated by the internal transactions of "interregional" firms (which, in the case of the states of the United States, would include the Federal Government). In such cases, purchases and sales transacted among branches or affiliates of the same enterprise are simply internal "bookkeeping" transactions, which do not affect the banking system or the balance of payments at all. Again, such transactions seem to be growing in importance even in international trade. In 1964, according to recent estimates in the *Survey of Current Business*, exports to foreign affiliates of American firms represented 25 per cent of total United States exports and about 33 per cent of nonagricultural exports, and were growing at a significantly faster rate than United States exports as a whole. For exports to Canada, the country with the largest proportion of United States direct investment, the figure was 46 per cent.¹¹ For regions within a single country, we can expect that the proportion of intra-firm transactions is significantly greater still, probably well over 50 per cent. To understand the significance of this fact for the balance-of-payments adjustment mechanism, we may recall that if, instead of regional banks, a country had only a single national bank through which all buying and selling transactions took place, all money flows would be internal bookkeeping transactions and interregional balance-of-payments problems could not arise. For the large proportion of financing transactions that are carried out internally by firms rather than externally through the banking system, the existence of interregional firms has exactly the same effect as an interregional bank.

In addition to these equilibrating flows of capital in the form of trade credit, financing for balance-of-payments disturbances among

United States Balance of Payments, 87th Congress, 2nd Session, 1962, p. 462. In addition, some proportion of direct investment, classified as "long term" in the balance-of-payments statistics of the United States, is actually short-term trade credit. The short-term component was estimated to be about one-sixth of United States direct investment in 1963. See: Review Committee for Balance-of-Payments Statistics, *The Balance of Payments Statistics of the United States* (Washington, D.C., 1965), pp. 62 and 143.

¹¹ Samuel Pizer & Frederick Cutler, "United States Exports to Foreign Affiliates of U.S. Firms," *Survey of Current Business*, Vol. 45 (December 1965).

closely integrated economies will come in the short run from induced capital movements initiated by the banks themselves in response to the disturbance. Ingram gives an example of this type of behavior: when a state or region experiences a capital inflow stemming from an initial disturbance to either the current or the capital account, the banking system will use the resulting increased reserves, at least in part, not to expand local loans but to acquire short-term assets through United States money markets, thus setting up an offsetting capital outflow. Similarly, the response to a capital outflow will take the form of offsetting sales of "generalized" assets by the banking system.¹² The prerequisite for this sort of behavior, says Ingram, is the existence of a high proportion of generally acceptable, as opposed to merely regionally acceptable, financial claims. In other words, he is postulating close integration of capital markets, one of the characteristics of a highly open economy.

Trade credits and offsetting purchases and sales of generalized financial claims by the banking system provide two effective devices for cushioning balance-of-payments disturbances which arise among regional economies, and thus reduce the reserve changes which would otherwise take place. And, by limiting reserve changes, these mechanisms also reduce the resulting money-stock effects which, magnified as they are by the fractional-reserve banking system, could otherwise be expected to lead to significant changes in domestic income, prices, and expenditures. But, significant as they are, these mechanisms represent temporary means of financing a situation of disequilibrium rather than mechanisms of adjustment which will help to restore equilibrium.¹³ For the net capital flows represented by changes in trade credit due to shifts in the current-account balance will decline rapidly once exports or imports have settled at a new level,¹⁴ and it seems unlikely that the

¹² James C. Ingram, "State and Regional Payments Mechanisms," *Quarterly Journal of Economics*, Vol. 73 (November 1959), pp. 613-632.

¹³ Kindleberger has recently suggested that the distinction be made between capital flows, both short and long term, induced by differences in capital scarcity and those induced by differences in international liquidity preference. He argues, furthermore, that up to a point, movements of the latter as well as of the former type are consistent with balance-of-payments equilibrium. See Charles P. Kindleberger, *Balance-of-Payments Deficits and the International Market for Liquidity*, Essays in International Finance No. 46 (Princeton, N.J.: International Finance Section, 1965). See also Walter S. Salant, "Capital Markets and the Balance-of-Payments of a Financial Center," in Fritz Machlup (ed.), *Maintaining and Restoring Balance in International Payments* (Princeton, N.J.: Princeton University Press, 1966), pp. 177-196.

¹⁴ This is so because net capital flows representing short-term trade credits will

banking system can keep up offsetting actions indefinitely. We are still faced with the question of what is to maintain such capital flows, or what happens to the external balance when they cease or are reversed.

Long-Run Adjustment

In considering the type of capital-account transactions which can be expected to provide not merely a short-run "cushion" but a mechanism of long-run adjustment to balance-of-payments disturbances,¹⁵ we must bear in mind the distinguishing characteristics of an open regional economy: a heavy dependence on the export sector and a high degree of mobility of the factors of production across regional boundaries. The central role of export fluctuations in a regional economy suggests that changes in the marginal efficiency of capital (MEC), and the resulting fluctuations in the rate of investment, are likely to be closely linked to shifts in demand schedules for the region's exports. From this viewpoint, increases in investment and in exports are seen not as independent and, in a sense, competitive exogenous disturbances, but rather as interdependent phenomena which are more likely to be positively than negatively correlated.

In a highly open economy, then, there is likely to be a significant "accelerator-type" link between changes in the level of exports and in the level of domestic investment, a link created by shifts in the MEC originating in the export sector. Furthermore, a significant proportion of any increase or decrease in the rate of domestic investment in such an economy is likely to be matched by corresponding inflows or outflows of capital, not only because of the mobility of capital across regional boundaries, but also because investment shifts are so often closely linked to the export sector. And, for a variety of reasons, "foreign" investors are generally more sensitive to changes in investment

occur only when the level of exports is changing. Once exports have settled down at their new level, the volume of new trade credits will simply offset the volume which is maturing during any given period, and there will be no net flow.

¹⁵ In his "taxonomic summary" of balance-of-payments changes, Machlup makes a three-way distinction among "real adjustment," "compensatory corrections," and "temporary financing." He puts autonomous capital movements, caused by changed profit expectations, in the second category and "induced" flows in the third, reserving the term "real adjustments" for changes in the balance on current account via changes in prices or incomes. See Fritz Machlup, "Adjustment, Compensatory Correction, and Financing of Imbalances in International Payments," in Robert E. Baldwin *et al.*, *Trade, Growth, and the Balance of Payments* (Chicago, Ill.: Rand McNally & Co., 1965), pp. 208-209.

opportunities connected with exports than to those arising in other sectors of the economy. And finally, because labor as well as capital is relatively mobile and sensitive to interregional differences in rates of return, capital flows which alter the capital/labor ratio and thus affect labor productivity and the wage rate in the region can be expected to bring about reinforcing flows of labor in the same direction.

The implications of the process just described are at variance with the conventional formulations of international balance-of-payments theory, which regard factor supplies as fixed for analytical purposes and take account of the effects of capital flows on income but not on output. The approach taken here implies that there are interactions between real income and the balance of payments, not merely via the export multiplier in an underemployed economy, but also, via the migration of factors of production, on the capacity side even at full employment. Without such factor movements, the real-income adjustment mechanism can operate only when domestic factors are unemployed. But for an economy which can pull in labor and capital from "outside," it is not inconsistent to assume that this income mechanism operates and at the same time to postulate a close link between shifts in investment and shifts in exports via capacity changes, which come into play only when full-capacity production levels have been reached.

The concept of external adjustment via autonomous flows of capital responding to changes in the marginal efficiency of capital is relevant to nations too, of course, and generally appears in one form or another in long-run growth models. But the fact that capital and, to an even greater extent, labor are more mobile interregionally than internationally makes such considerations particularly important for regional analysis. This matter of factor mobility represents the major conceptual distinction between the theory of international and that of interregional finance. And today, perhaps more than ever before, reality seems to follow theory. At present, international flows of labor and of private long-term capital funds are restricted or otherwise diverted in many ways from responding to underlying differences in the productivity of labor and capital as reflected in wage rates and rates of return on capital. But among regions of a single country, although the markets are far from perfect in a geographical sense, the twin assumptions of capital and labor mobility are sufficiently valid to serve as the basis for a modified theory of balance-of-payments adjustment.

The existence of interregionally mobile supplies of complementary factors of production implies that any given flow of capital, by inducing

movements of labor in the same direction, can be expected to exercise greater and more rapid leverage on output in a regional than in a national setting. And this, in turn, suggests that the span of time over which one can ignore effects on capacity without doing undue violence to reality is likely to be shorter in the case of a region than in that of a nation. In other words, we can expect to find among regions of the same country a high incidence of the sort of mutually reinforcing flows of labor and capital which, at the international level, contributed so much to the opening up of new areas of the world in the 19th century,¹⁶ but which have been largely choked off during much of the 20th.

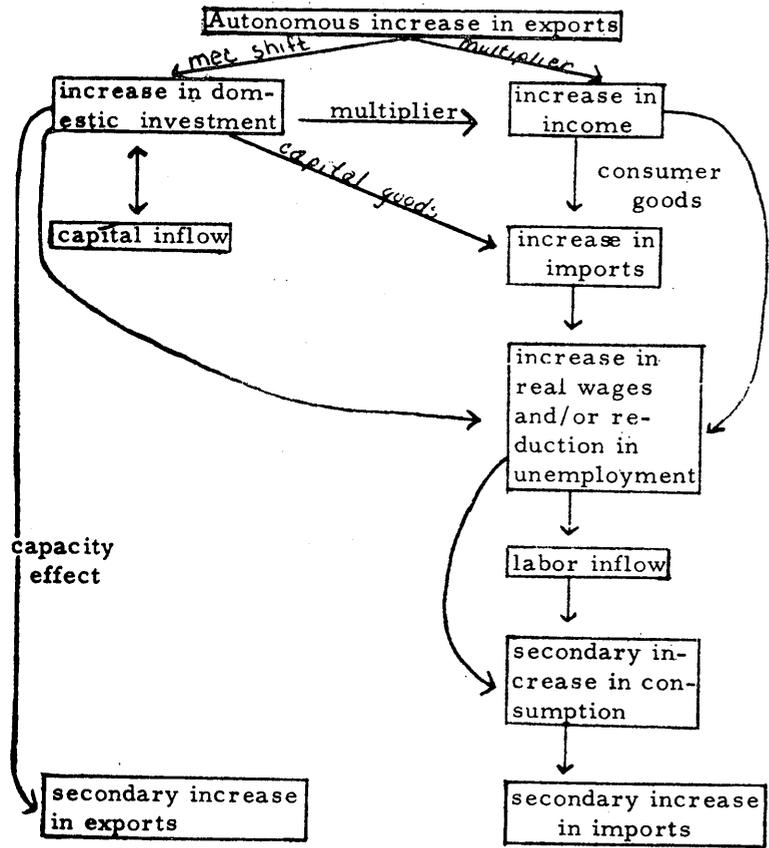
Export-led Growth and Export-led Decline

The various types of short-term capital flows described earlier as mechanisms for financing or "cushioning" an existing state of external imbalance are likely to operate in roughly the same way for any region, regardless of the internal state of its economy. But the flows of private capital available for real investment, which represent a vehicle of long-run external adjustment via their effects on capacity and output, depend upon interregional differences in the marginal efficiency of capital. And, this MEC schedule will tend to be high in a regional economy which is experiencing the inflationary pressure associated with prosperity, and low in a regional economy which is undergoing deflationary pressure or recession. The relationship between the internal state of a regional economy and the impact of shifts in the MEC schedule and the resulting capital flows on its external payments position is perhaps best seen by looking at the opposite and symmetrical effects which are likely to take place in two different types of regions, as outlined in Figure 1. A somewhat simplified version of the basic model underlying the tabular presentation is given in algebraic form in the Appendix. This algebraic version illustrates the conditions under which an initial shift in the export sector will be overbalanced by induced changes in imports, and also gives the conditions required for the maintenance of "basic" payments balance during the process of export-led growth.

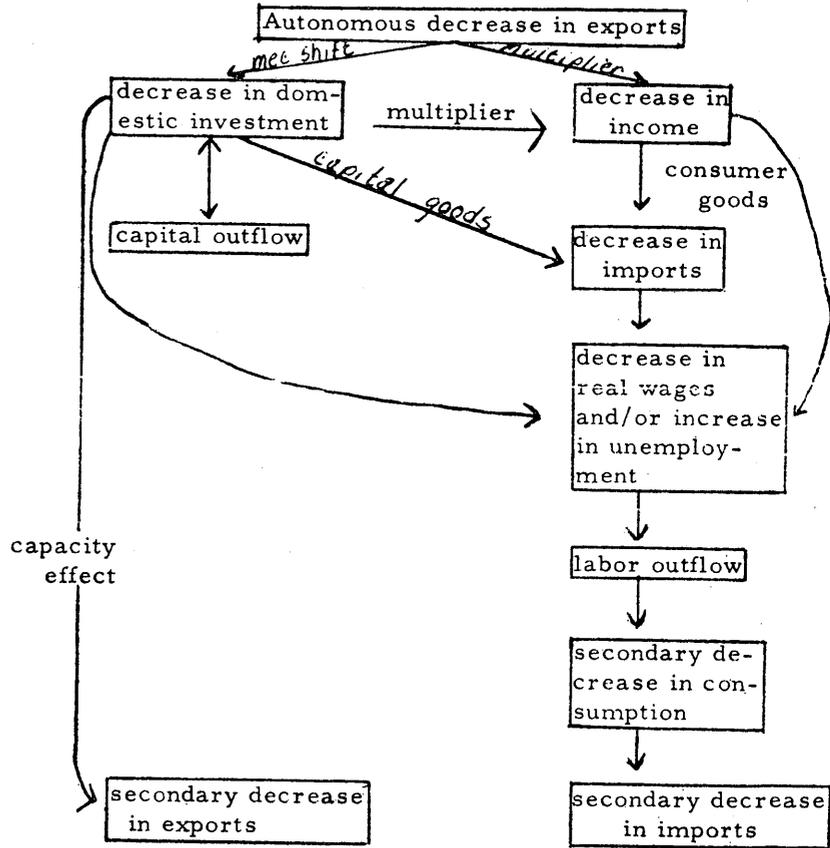
The first region, for which we might regard California as a prototype, is one which is experiencing inflationary pressure and rapid growth. Because of the dominance of the export sector in an open regional economy, we may reasonably postulate that much of the

¹⁶ See Brinley Thomas, *Migration and Economic Growth, A Study of Great Britain and the Atlantic Economy* (Cambridge: Cambridge University Press, 1954).

Export-led growth - "California"



Export-led decline - "Appalachia"



growth impetus originates in that sector. The immediate effect of an expansion in demand for its exports will, of course, be an increase in exports themselves and, therefore, an immediate surplus on current account. But if the economy was operating fairly close to capacity initially, the immediate increase in exports may be overshadowed by an expansion of investment in the export sector, and perhaps in other sectors as well if the initial increase in incomes has set an accelerator effect in motion. Depending on the relative magnitudes of the parameters involved, as is illustrated in the Appendix, these interdependent increases in investment and in income may well convert the region's initial current-account surplus into a deficit which serves to "transfer" the inflow of external capital attracted by increased opportunities for profitable investment in the export sector. This shift is particularly likely to occur when we take into account the consumption, and therefore the import requirements, of the newly imported labor which is likely to enter the region in response to a rise in the capital/labor ratio and thus in the marginal productivity of labor and the wage rate. Ultimately, the movement of the current-account position will be reversed again, as the exports made possible by increases in capacity begin to flow. At the same time, as the increased rate of investment exerts downward pressure on the MEC in the export sector and debt amortization or repatriation of profits begins, the net inflow of foreign capital will slacken.

The situation of a region suffering a decline in demand for its exports, whether due to changes in tastes, advances in technology which affect its competitive position adversely, or some other reason, is the mirror-image of the one just described. In such a region, which we have dubbed "Appalachia" here, the initial decline in exports will cause both internal deflationary pressure and an external deficit on current account. Since this situation will create downward pressure on the MEC and the rate of investment, particularly in the export sector, an outflow of capital is likely to compound the deficit, although this process may operate somewhat more slowly than the increase in foreign investment of the previous case. But then, in the mirror-image of the events experienced in "California," Figure 1 shows a possible reversal of the movement of the current account. The possibility of such a reversal arises from the cumulative effects on imports of reduced investment, lowered wage rates or increased unemployment rates, and the consumption effects of the outmigration of both capital and labor. And finally, as the effects of disinvestment impinge increasingly on capacity

and output in the export sector, the current account will deteriorate again while, unless there are *further* downward shifts in the demand schedule for exports and thus in the MEC, the rate of capital outflow will attenuate.

As presented in Figure 1, with the various steps in the process laid out in neat marching order, the model postulated seems excessively simplistic. But the sequential presentation which is essential for expositional purposes should not be taken too literally. In reality, the various effects described will sometimes follow each other, but they will often also occur simultaneously, acting as countervailing pressures of which only the net effect can be observed.

It should also be noted that some of the simplifying assumptions implicit in the scheme of Figure 1 could be abandoned without doing violence to the basic model. For example, all the processes at work are discussed above in terms of their effects on real income and on various types of expenditure, but they can operate equally well through effects on relative prices. The introduction of this complication would not alter the direction of change postulated in any of the steps of Figure 1, although of course any attempt to estimate actual values for the parameters described might well have to be cast in terms of price elasticities as well as of the propensities described above. Similarly, the effects on domestic income and on the current-account balance would be similar if the initial expansion were to take place in the import-competing rather than the export sector. But, the effects on capital flows would probably be weaker, since foreign investors are generally most sensitive to changes in investment opportunities in the export sector.

IV. THE "COMMON-CAUSE" HYPOTHESIS AND ITS IMPLICATIONS

The process of long-run balance-of-payments adjustment outlined here is a "common-cause" theory of international equilibration applied to very open economies.¹⁷ Instead of assuming either that initial surpluses or deficits on current account are "financed" by accommodating capital flows or that original disturbances in the capital account are "transferred" via induced current-account imbalances, it regards changes on both current and capital account as stemming from shifts in the marginal efficiency of capital.

This common-cause hypothesis has several major implications. One is that a disturbance which originates in the export sector is initially compounded rather than offset on both current and capital account, placing a double burden on the short-run mechanisms which "cushion" balance-of-payments disturbances:¹⁸ as Figure 1 indicates, an upward shift of the MEC schedule in the export sector will bring about both an increase in exports and an inflow of investible capital; a downward shift will lead initially to both a current-account deficit and a capital outflow. From the conventional viewpoint, assuming fixed factor supplies, this cumulative effect appears to represent a movement away from both internal and external equilibrium, aggravating both the inflationary (or deflationary) pressure on the internal economy and the external payments imbalance. But the process which is disequilibrating in the short run is equilibrating in the long, as the subsequent steps of

¹⁷ Such an explanation of international balance-of-payments adjustment was presented as long ago as 1925 in James W. Angell, *The Theory of International Prices* (New York: Augustus M. Kelley, 1925, 1965), pp. 527-528 and in 1929 by John H. Williams, "The Theory of International Trade Reconsidered," *Economic Journal*, Vol. 39 (June 1929), pp. 195-209. Angell rejected this view, which he referred to as the "cyclical hypothesis," in two pages of an appendix, whereas Williams made it one of the foundations of his searching criticism of the classical theory of international trade. The term "common cause" theory was coined, to my knowledge, by John A. Stovel, in *Canada in the World Economy* (Cambridge, Mass.: Harvard University Press, 1959), ch. 7. Stovel outlines the genealogy of the theory in pp. 69-74.

¹⁸ Scitovsky points out "... that the interregional flow of funds on capital account tends not only to offset but rather more than to offset the excess or deficit in regional balances of trade," in response to differences in the demand for liquidity which are closely correlated with levels of investment, employment and rates of expansion. Tibor Scitovsky, *Economic Theory and Western European Integration* (Stanford, California: Stanford University Press, 1958), pp. 89-90.

Figure 1 indicate. In the case of an upward shift in the export-demand schedule, the expansion of output and capacity created by inflows of capital and labor will move the full-employment level continuously upward and thus prevent continuing inflationary pressure from being dissipated in price inflation. At the same time, the expansion of investment and income stimulated by the initial rise in profit opportunities will lead to an expansion of imports. This increase in imports will lessen and probably for a time reverse the initial current-account surplus, until the output effects of the increased investment begin to outstrip the income effects.

A second implication of the common-cause formulation outlined here is that there is nothing implausible about the coincidence of prosperity and deficit, or of recession and surplus, in an open economy. This conclusion is quite different from the one implied by the Keynesian multiplier formulation of the balance-of-payments adjustment process in the case of open economies dominated by fluctuations in the export sector: that internal recessions can be expected to coincide with external deficits and periods of prosperity with balance-of-payments surpluses. These differing implications stem from the fact that the multiplier analysis takes into account the effect of investment on income, and thus on imports, but takes no account of its longer-run effect on the capacity to supply exports, whereas the formulation presented here takes account of the effects of investment on output as well as on income, and on exports as well as on imports.¹⁹

Will this "overbalancing" of the initial cumulative disturbance on current and capital account actually occur, causing export-led prosperity to coincide with a current-account deficit (or export-led recession with a current-account surplus)? It will when the multiplicative effects of investment augment aggregate demand and imports more than—or more rapidly than—that same investment generates additional capacity, output, and exports.²⁰ In terms of the sequential presentation of Figure 1, with the growing region as our example, a rapid

¹⁹ In their projections of the United States balance of payments, the Brookings group analyzed the role of "potential output" (supply capabilities) as one of the major determinants of the basic balance through its interrelated effects on the current account and on capital flows. See Walter S. Salant *et al.*, *The United States Balance of Payments in 1968* (Washington, D.C.: The Brookings Institution, 1964), especially pp. 19-23.

²⁰ James Ingram, "Growth in Capacity and Canada's Balance of Payments," *American Economic Review*, Vol. 47 (March 1957), p. 104. See also: James Ingram, "Capital Imports and the Balance of Payments," *Southern Economic Journal*, Vol. 22 (April 1956), pp. 411-425.

increase in the rate of investment, stimulated by the initial expansion of the export sector, may temporarily have both direct and indirect effects on imports which outstrip the effects on exports of increases in capacity. (In the simplified algebraic model presented in the Appendix, the maximum rate of increase in investment that can occur without causing a current-account deficit is shown to depend on the marginal propensity to save and the incremental output/capital ratio.) But even if this overbalancing occurs, once the pace of investment begins to slacken, the portion of expanded output made possible by past investments that will be available for export must eventually exceed the direct and indirect import requirements of current investment. When this situation is reached, it will produce a surplus on current account, which may serve to "finance" the capital outflow associated with net debt repayment.

Public Capital Flows in the Adjustment Process

Nothing has been said so far about the role played by flows of *public* capital in the balance-of-payments adjustment of an open regional economy. Such an omission contrasts sharply with the very heavy stress placed by some analysts on the equilibrating role of interregional transfers of government funds which offset imbalances on private account. Their emphasis is based on the consistently inverse relationship observed between Treasury transfers (net public capital flows) and transit clearings (net private capital flows) among Federal Reserve Districts.²¹

One cannot make too much of this inverse relationship, however. Except for changes in reserve balances, these two magnitudes *must* be equal and opposite in sign. The fact that they are generally closely offsetting, and therefore that changes in reserve balance are generally small, does suggest that the various short-run "cushioning" mechanisms described earlier function efficiently among the regions of the United States. But this definitional relationship in itself tells us no more about the chain of causation, and offers no more basis for assuming *a priori* that one particular group of transactions is autonomous and the other accommodating, than does the more familiar equality between current-

²¹ This relationship was first noted by Hartland (Penelope Hartland, "Inter-regional Payments Compared with International Payments," *Quarterly Journal of Economics*, Vol. 63 [August 1949], pp. 342-407.) For evidence of its persistence see: Norman N. Bowsher, J. Dewey Daane and Robert Einzig, "The Flow of Funds Between Regions of the United States," *Papers and Proceedings of the Regional Science Association*, Vol. III (1957), pp. 142-145.

account and capital-account balances in the national balance-of-payments statistics. At least one observer argues, in fact, that "Casual inspection of federal expenditures and transfer payments suggests that the great bulk of federal outlays are not undertaken in response to the payments positions of the several regions. . . . Similarly, federal revenues do not, for the most part, vary in such a way as to produce an equilibrating response to regional payments pressures."²²

Clearly, the role played by government capital flows in the interregional balance-of-payments adjustment process is not determined simply by economic considerations and therefore cannot be taken for granted. And there is no reason to assume that such a heterogeneous group of transactions as is encompassed by the category "Federal receipts and expenditures" should all have the same general effect on any specific regional payments position. With respect to their role in interregional payments balances, government flows need to be divided into at least three categories:

(1) Government tax receipts and transfer payments. Net flows in this category are known to have automatic stabilizing effects on *internal* income levels. The Keynesian model of interregional payments balances advanced by Kenen, which implies a high positive correlation between internal recession and external deficit, suggests that such flows would automatically tend to offset external imbalances as well. But the common-cause model presented here, which suggests rather that, depending on the relative magnitudes of the underlying parameters, both export-based prosperity and export-based recession may coincide at times with surplus and at other times with deficit, makes us more agnostic concerning the role played by these "built-in stabilizers" in the interregional adjustment process.

(2) Government expenditures for goods and services, which are not really "capital flows" at all, but might better be regarded as a separate category of "exports."²³ To the extent that the Federal Government attempts to award contracts in depressed areas, these flows may or may not be equilibrating, by the same reasoning as outlined under (1) above. But a recent detailed examination of the impact of defense expenditures suggests that anti-recession efforts have had little effect

²² James Ingram, *Regional Payments Mechanisms: The Case of Puerto Rico* (Chapel Hill, N.C.: University of North Carolina Press, 1962), pp. 21-22.

²³ The problems involved in allocating Federal Government expenditures among states are described in J. Thomas Romans, *Capital Exports and Growth Among U.S. Regions* (Middletown, Conn.: Wesleyan University Press, 1965), pp. 25-29.

on the regional distribution of such expenditures.²⁴ And it is clear that a large proportion of government contracts is awarded in prosperous, fast-growing regions and may even, as in the case of California and the whole Pacific Region, be a major cause of the region's high level of economic activity.²⁵

(3) Flows of funds on Treasury account arising from public borrowing: sales and redemptions of Government securities and other Government transactions in the capital markets. Such transactions tend to create a flow of funds on Treasury account into major financial centers, particularly New York, when the Federal debt is decreasing and redemptions exceed new debt issues. Similarly, Government funds tend to flow out of these major centers when the debt is increasing and new debt issues exceed redemptions. These flows thus bear no direct and obvious relationship to regional payments positions as such, but they have, at times, played a significant equilibrating role none the less.²⁶

Even this very cursory examination makes it amply clear that these three categories of Federal Government financial transactions, whose net effects are inextricably lumped together as "Treasury transfers" in the figures of the Interdistrict Settlement Fund, actually have widely different causes and very different implications for interregional balance-of-payments adjustment. There appears to be little basis for assuming that their net effect will represent a force for adjustment in interregional payments balances.

Some Empirical "Puzzles" and the Common-Cause Hypothesis

The view of the interregional balance-of-payments adjustment process outlined here helps to explain a number of empirical "puzzles" posed by others, results which cannot be readily reconciled with the implications of the conventional theory of international adjustment. One of these is the phenomenon first observed and analyzed by Hartland: that balance-of-payments relationships among regions of the United States functioned without apparent strain, and indeed with very small shifts in regional reserve balances, even during the disruptive 1930's, despite the fact that "trade between different sections of

²⁴ Roger E. Bolton, *Defense Purchases and Regional Growth* (Washington, D.C.: The Brookings Institution, 1966), pp. 143-147.

²⁵ *Ibid.*, p. 98.

²⁶ See Hartland, *op. cit.*, pp. 400-407 for an enlightening discussion of the relationship between Government borrowing and redemptions and the interregional flow of funds during the 1920's and 1930's.

the United States is conducted on the basis of a monetary mechanism which closely approaches a full and complete gold standard with a minimum of impediments to trade."²⁷

Hartland assigns to interregional flows of public funds the major role in this equilibration process. I would suggest rather that, in the short run, the absence of drastic shifts in reserves and of concomitant money-supply effects on regional incomes is due to the various cushioning mechanisms, described earlier, which arise from capital-market integration. These mechanisms include the importance of intra-firm transactions in short-term capital flows, and the offsetting transactions in "generalized" financial claims undertaken by commercial banks. In the longer run, the relative smoothness of the interregional adjustment process appears to owe much to the leverage exerted on income and price effects by the large import propensities and high demand and supply elasticities characteristic of open economies. And, finally, the main thrust of this study is that the interrelationships among changes in the current account and in flows of capital and labor which arise from shifts in the MEC schedule in the export sector play a crucial role in reducing the problems of long-run adjustment among closely integrated economies.

The longer-run interregional process outlined here also appears to be consistent with the results of three more recent studies, each of which offers evidence of a close interrelationship between increases in exports and increases in investment and capital inflows in an open economy experiencing export-led growth. In his recent investigation of the United States, *Capital Exports and Growth Among U.S. Regions*, Romans found a significant degree of positive correlation between a region's balance-of-payments position in 1953 and its rate of growth over the 1929-1953 period: states and regional groups of states which were net capital importers in 1953 (that is, deficit regions on current account) had a significantly higher rate of growth than did "surplus" states and regions which were net exporters of capital.²⁸ This observed

²⁷ *Ibid.*, p. 392.

²⁸ Romans' evidence relates to long-run movements over a quarter of a century. My own efforts, using Romans' data, to find some significant statistical relationship between the state of a region's internal economy, in a macroeconomic sense, and its trade-balance position at a point in time were generally unsuccessful. A significant positive relationship was found, however, between the *percentage change* in manufacturing employment in each state between 1953 and 1957, and the *percentage change* in each state's export surplus (not including government expenditures or income on investments). Although the question needs to be pursued further, this preliminary evidence suggests that over a short period, during which

phenomenon, as Romans himself comments, is logically consistent with the fact that export increases are a major source of growth in such economies only under the assumption that export growth is accompanied by inflows of capital and labor from outside the region, an inflow "transferred" through an adjustment process which for a time overwhelms the initial expansion of demand for exports. For a time, in other words, while the MEC schedule is shifting and factor inflows and investment levels are responding to this shift, the region's marginal propensity to spend must exceed unity. This is the situation postulated in Figure 1.

Similar conclusions emerge from the open-economy variant of the Harrod-Domar growth model utilized by Ingram in an attempt to refine Viner's famous model of the Canadian balance of payments between 1900 and 1913. During this period Canada was experiencing export-led growth and enjoyed a high degree of capital-market integration with Great Britain. Viner's investigation has long been regarded as empirical support for the classical price-specie-flow hypothesis of adjustment to capital inflows. But, even when bolstered by consideration of income as well as price effects, Viner's model fails to explain why Canadian exports rose over the period, rather than falling as the theory would predict. Ingram's model takes into account the expansion of productive capacity stemming from the long-term-capital inflows which responded to, and at the same time supported, Canada's rapid economic expansion. Using this model, together with estimates of the marginal propensities to save and to import and of the marginal capital/output ratio, he is able to generate a series of calculated values for income, exports and imports over the 1900-1913 period which correspond more closely with the actual figures than do Viner's.²⁹ Furthermore, whereas the causal sequence implied by classical analysis would predict downward pressure on interest rates in the capital-

factor supplies are roughly constant, the relationship between prosperity and surplus and between deflation and deficit predicted by the Keynesian model holds, whereas the relationship described here predominates over periods long enough for significant factor movements to take place.

Romans derives his estimates of interregional capital flows by estimating saving, investment, taxes, and government spending for each state, and then using the equality: $\text{Capital outflow} = (X - M) = (S - I) + (T - G)$. By thus equating capital flows with the imbalance on current account, he implicitly assumes that changes in reserves are always zero.

²⁹ This model assumes continuous full employment of all resources and a rise in money income which just keeps pace with the expansion of capacity. See: Ingram, "Growth in Capacity . . .," pp. 95-96.

receiving country, Ingram's formulation is consistent with the tight money and rising interest rates which actually characterized the Canadian economy over the period.

A more comprehensive study which reveals similar interrelationships among exports, investment, capital inflows, and imports is Williamson's investigation of the relationship between the "long swings" in the domestic economy of the United States and its balance of payments. Although Williamson's observations and conclusions cover nearly a century, from 1820 to 1913, the period of particular interest to us is 1820-1860, during which the United States was still a highly open economy whose disturbances originated primarily in the export sector.³⁰ Despite the importance of exports to the internal state of the nation's economy, Williamson found that the current account tended to show deficits during upswings and surpluses during downswings, indicating the "unstable disequilibrium" situation in which secondary effects on imports, outlined in Figure 1, overbalanced the initial changes in exports. In addition, however, Williamson found that the nation's capital and gold flows moved systematically with rather than against the long cycle.³¹ The fact that gold flowed in during the upswing and out during the downswing implies a situation in which net capital flows exceeded the current-account imbalance and thus helped the money supply to keep pace with the growth of the domestic economy. Far from being "induced" by the balance-of-payments situation, Williamson argues, these gold movements and the capital flows underlying them were autonomous flows responding to high profit opportunities in the burgeoning export and transportation industries of the United States. Such movements financed the trade deficits of the upswing and at the same time made possible a far more rapid expansion of American exports than would otherwise have been possible.³²

Finally, another recent study of economic relationships among the states of the United States offers strong evidence of the role played by cumulative, mutually-reinforcing interregional movements of labor and capital. In their investigation of state growth patterns in the United States between 1919 and 1953, Borts and Stein concluded that the most

³⁰ J. G. Williamson, *American Growth and the Balance of Payments* (Chapel Hill, N.C.: University of North Carolina Press, 1964), Ch. 2. See also: Douglass C. North, *The Economic Growth of the United States, 1790-1860* (Englewood Cliffs, N.J., Prentice-Hall, 1961), for an analysis of the economic history of the United States during that period in terms of the "export-led-growth" hypothesis.

³¹ Williamson, *op.cit.*, Chs. 4 and 5.

³² *Ibid.*

powerful explanatory factor of differential rates of manufacturing-employment growth among states is the growth rate of the labor-supply function.³³ They point out, further, that "findings by J. T. Romans indicate that capital moves among U.S. regions in accordance with our theory; that is, capital moves from regions of low growth to regions of high growth."³⁴ Taken together, the evidence of Romans and of Borts and Stein indicates a high degree of complementarity between flows of labor and flows of capital among the regions of the United States.

The Problems of Asymmetry

In general, the empirical investigations just cited have focused on the economic interrelationships observed in the process of export-led *growth* in an open economy. They have touched only indirectly or incidentally on the dynamics of export-led *decline*. And this process, which has been little investigated and about which very little is known, is important not just because it represents one of the two elements in the total picture, but because it yields a view of just those important asymmetries which fail to show up in the formal, symmetrical presentation of Figure 1. The interdependent process of internal and external adjustment outlined here depends heavily on changes in investment, employment, and aggregate economic-activity levels and on inter-regional factor flows. One need not reflect long to realize that changes in these variables of the sort that accompany growth are likely to be regarded as acceptable mechanisms of adjustment, whereas changes in the same variables are certain to be regarded as a serious form of *maladjustment* when they take place in the context of economic decline.

This asymmetry is acquiring increasing importance because the very developments which have enhanced the importance of the inter-regional adjustment process in recent years are likely at the same time to make residual balance-of-payments adjustment via downward shifts in real income, employment, and activity levels less and less acceptable politically. Countries have increasingly shown themselves willing, even if reluctant, to surrender some aspects of economic sovereignty in return for the benefits of multinational economic union, but it is unlikely that a legitimate concern for its future, to say nothing of the hot flame of nationalism, will allow any informed nation to accept changes

³³ George Borts and Jerome Stein, *Economic Growth in a Free Market* (New York: Columbia University Press, 1964), Chs. 7 and 10.

³⁴ *Ibid.*, p. 145.

in its level of employment and economic activity, accompanied by outmigration of its more mobile resources, as a means of bringing its balance of payments into line. And even within single countries, the political priority assigned to regional as well as national prosperity is increasing: Appalachia appears to be only the first of several lagging regions in the United States to be singled out for concern. This priority accompanies an increasing awareness of the heavy social costs implicit in the community disruption brought about by economically-motivated migration on a large scale. This view implies, too, a growing refusal to accept the abandonment of immobile resources as the price of economic efficiency and progress.

If, then, adjustment of balance-of-payments deficits via downward shifts in the level of employment and real income is going to meet with resistance at the regional level, as it long has at the national, a larger burden of long-run adjustment is thrown on movements of factors of production, particularly capital. It has been suggested here that, for fast-growing regions with ample opportunities for productive investment, factor-market integration might be all that is needed to provide a smoothly functioning balance-of-payments adjustment mechanism.³⁵ But for regions experiencing a downward shift in the export-demand schedule and a concomitant decline in profitable investment opportunities, capital inflows can serve only as short-term financing preceding real adjustment. It is in such regions that unwillingness to permit substantial changes in the level of employment and the resulting income loss or outmigration of the work force would place a very heavy burden indeed on compensatory inflows of *public* capital. But, again, such inflows can serve only as temporary financing unless either the government is willing to go on subsidizing the balance of payments of the region indefinitely, or the public capital is invested in social overhead or other projects which succeed in overcoming the competitive disadvantage in exports which underlies both the internal and the external aspects of the region's decline.

If public funds can thus open up new opportunities for profitable private investment and, at the same time, enable the region to branch out into new lines of production and thus reduce the decline in its terms of trade which would otherwise be required to restore its export-

³⁵ James Ingram has been the major proponent of capital-market integration as a *sine qua non* for economic union. See particularly his "State and Regional Payments Mechanisms," . . . and "A Proposal for Financial Integration in the Atlantic Community," in *Factors Affecting the United States Balance of Payments*, Joint Economic Committee, 87th Congress, 2nd Session, 1962.

competitiveness, then government financing of the original deficit can be converted into a tool for fundamental adjustment. But there is nothing automatic about such a process; on the contrary, the implication here is that, for a deficit region which lacks the economic dynamism to attract private investment funds, the only alternative to external balance achieved through a painful combination of real-income reduction and resource outflows lies along the rocky path of economic development. And certainly the increased burden placed on the central treasury, whether national or supranational, by an increased stress on regional stabilization of employment and economic activity in an open-economy setting must be explicitly recognized if the responsibility is to be met.

The pressure in many parts of the world for economic unions along broader geographical lines is only one manifestation of what seems to be a more general movement toward increasing interdependence and specialization, the aim of which is to escape the limitations of autarky and protectionism without relinquishing the primacy of domestic economic goals. This trend toward economic "openness" or "integration" will doubtless be accelerated by the formation of additional customs unions, as intra-union trade and factor movements become freer and more important, but it can be initiated without formal treaties. For, as Triffin and Grubel have pointed out, the countries of Western Europe displayed a high degree of integration even during the decade *before* the Treaty of Rome gave birth to the Common Market.³⁶ There is an urgent need, therefore, for new modes of analyzing situations where the predominance of the export sector, combined with a high degree of factor mobility, cause economies to react to disturbances in ways not fully explained by the existing theories of international economic adjustment. In discussing balance-of-payments relationships among regions of the United States, this paper has tried to integrate the capital account into balance-of-payments theory in a way which should prove helpful in analyzing the external response mechanisms of all highly open economies. One next step must be, of course, in the direction of empirical validation, to determine whether the modifications and distinctions suggested here can indeed explain the behavior of such economies better than the conventional approaches.

³⁶ Robert Triffin and Herbert Grubel, "The Adjustment Mechanism to Differential Rates of Monetary Expansion among the Countries of the OEEC," *Review of Economics and Statistics*, Vol. 44 (November 1962), p. 491.

APPENDIX

This appendix indicates the conditions under which the process of export-led growth can lead to a *deficit* in the trade balance, and also illustrates the conditions under which a country's basic payments position could remain in balance during the growth process. The conditions are first outlined in terms of the simple open-economy variant of the Harrod-Domar growth model employed by Ingram.³⁷ This model assumes continuous full employment of all resources³⁸ and a noninflationary rise in money income which just keeps pace with the expansion of capacity. In this version investment is regarded as exogenously determined. In the second, slightly more complicated version of the model, investment changes are regarded as a linear function of last year's changes in exports, reflecting the assumption in the text that shifts in the schedule of the marginal efficiency of capital, leading to changes in the level of investment, are likely to originate in the export sector.

Symbols:

Y = national income	m = marginal propensity to import
I = net investment	c = marginal propensity to consume domestic output
M = imports	s = marginal propensity to save
C = consumption of domestic output	σ = incremental output/capital ratio, including contributions of increased labor force and land mobilization which accompany increase in capital stock
S = gross savings	Δ = change in variable from $t-1$ to t
K = capital inflow	ϕ, γ = constants of proportionality ($0 < \phi, \gamma < 1$)

Note: Where no time subscript appears, the subscript t is implied.

³⁷ See James Ingram, "Growth in Capacity and Canada's Balance of Payments," *American Economic Review*, Vol. 47 (March 1957) and *Regional Payments Mechanisms: The Case of Puerto Rico* (Chapel Hill, N.C.: University of North Carolina Press, 1962), p. 109.

³⁸ Strictly speaking, this model assumes the full utilization of capacity but not the full employment of labor; it does not take into account the effects on the trade balance of increases in consumption stemming from the inflow of labor which would have to occur in order to have a growth of real output under conditions of full employment.

I. A) TRADE-BALANCE CONSTRAINTS ON EXPORT-LED GROWTH

Define the growth of income as equal to the growth of capacity, which in turn equals last year's investment multiplied by the incremental output/capital ratio:

$$1) \Delta Y = I_{t-1} \sigma.$$

Define total imports as the sum of imports for consumption, M_c , imports for investment, M_i , and imports for re-export, M_x , so that:

$$2) \Delta M_c = m_c \Delta Y = m_c I_{t-1} \sigma; \Delta M_i = m_i \Delta I; \text{ and } \Delta M_x = m_x \Delta X.$$

Therefore:

$$3) \Delta M = m_c I_{t-1} \sigma + m_i \Delta I + m_x \Delta X.$$

Now, separate exports into their domestic and imported components, X_d and X_m , and define the increase in the domestic component in terms of the residual capacity available after the increments in capacity allotted to increases in consumption and in the domestic component of investment are accounted for.³⁹

Let:

$$4) \Delta X_m = m_x \Delta X, \text{ and } \Delta X_d = (1-c)I_{t-1}\sigma - (1-m_i)\Delta I.$$

Therefore:

$$5) \Delta X = m_x \Delta X + (1-c)I_{t-1}\sigma - (1-m_i)\Delta I.$$

Then:

$$6) \Delta M - \Delta X = m_c I_{t-1} \sigma + m_i \Delta I + m_x \Delta X - m_x \Delta X - (1-c)I_{t-1} \sigma + (1-m_i) \Delta I = (m_c + c - 1)I_{t-1} \sigma + \Delta I = \Delta I - s\sigma I_{t-1}.$$

Thus, the condition that $\Delta M - \Delta X > 0$ or $\Delta M > \Delta X$ implies:

$$7) \frac{\Delta I}{I_{t-1}} > s\sigma.$$

That is, the process of export-led growth will lead to a current-account deficit whenever the rate of growth of investment exceeds the marginal propensity to save multiplied by the

³⁹ Because changes in the level of exports are defined in terms of the residual capacity available, this model is applicable to the situation of export-led growth but not to that of export-led decline. In the latter case, presumably initial changes in the level of exports would lead to temporary *excess* capacity, since disinvestment is a slow process, and it would not make sense to define export changes in terms of a capacity constraint.

incremental output/capital ratio. This is the conclusion reached by Ingram.

B) BASIC-BALANCE CONSTRAINTS ON EXPORT-LED GROWTH

Define the capital inflow, K , as a constant proportion (ϕ) of domestic investment, so that:

$$8) \Delta M - \Delta X - K = \Delta M - \Delta X - \phi I.$$

Substituting the argument in (6) above for $\Delta M - \Delta X$, note that $I = I_{t-1} + \Delta I$ and that (8) is equal to:

$$9) \Delta I - s\sigma I_{t-1} - \phi(I_{t-1} + \Delta I) = (1 - \phi)\Delta I - (s\sigma + \phi)I_{t-1}.$$

The condition for "basic balance" is that the current-account deficit be equal to the inflow of foreign capital, i.e. that $M - X - K = 0$. Setting (9) above equal to zero:

$$10) \frac{\Delta I}{I_{t-1}} = \frac{s\sigma + \phi}{1 - \phi}.$$

That is, the rate of growth of investment consistent with the maintenance of basic payments balance varies directly with the marginal propensity to save, the incremental output/capital ratio and the proportion of investment financed from abroad.

II. A) TRADE-BALANCE CONSTRAINTS ON EXPORT-LED GROWTH, DEFINING THE INCREASE IN INVESTMENT AS A FUNCTION OF THE INCREASE IN EXPORTS IN THE PREVIOUS PERIOD

11) $\Delta M - \Delta X = \Delta I - s\sigma I_{t-1}$, from (6) above. Now assume that ΔI is a function of ΔX_{t-1} , and that the functional relationship can be approximated by:

$$12) \Delta I = \gamma \Delta X_{t-1}.$$

Then:

$$13) \Delta M - \Delta X = \gamma \Delta X_{t-1} - s\sigma I_{t-1}.$$

The condition for a current-account deficit, $\Delta M - \Delta X > 0$, therefore requires that:

$$14) \frac{\Delta X_{t-1}}{I_{t-1}} > \frac{s\sigma}{\gamma}.$$

That is, the process of export-led growth will lead to a current-account deficit whenever the export increase of the previous period exceeds a critical proportion of investment in that period, a proportion which depends directly on s and σ and inversely on γ . This apparently paradoxical result stems from the assumption that the current increase in investment is proportional to the export increase of the previous period; therefore, the larger the previous growth in exports the larger is current investment, which, in turn, is assumed to stimulate imports immediately, but to increase exports with a lag.

B) BASIC-BALANCE CONSTRAINTS ON EXPORT-LED GROWTH, DEFINING THE INCREASE IN INVESTMENT AS A FUNCTION OF THE INCREASE IN EXPORTS IN THE PREVIOUS PERIOD

From (8) above, and the identity $I=I_{t-1}+\Delta I$:

$$15) \Delta M - \Delta X - K = \Delta I - s\sigma I_{t-1} - \phi(I_{t-1} + \Delta I) = (1 - \phi)\Delta I - (s\sigma + \phi)I_{t-1}.$$

Then substituting from (12) above for ΔI :

$$16) \Delta M - \Delta X - K = (1 - \phi)\gamma \Delta X_{t-1} - (s\sigma + \phi)I_{t-1}.$$

The condition for "basic" payments balance, $\Delta M - \Delta X - K = 0$, can then be shown to require that:

$$17) \frac{\Delta X_{t-1}}{I_{t-1}} = \frac{s\sigma + \phi}{\gamma(1 - \phi)}.$$

Here, basic balance-of-payments equilibrium can be maintained during the process of export-led growth only if the expansion of exports in the previous period was less than or, at most, equal to a critical proportion of total investment during that same period, a proportion which varies directly with s , σ , and ϕ and inversely with γ .

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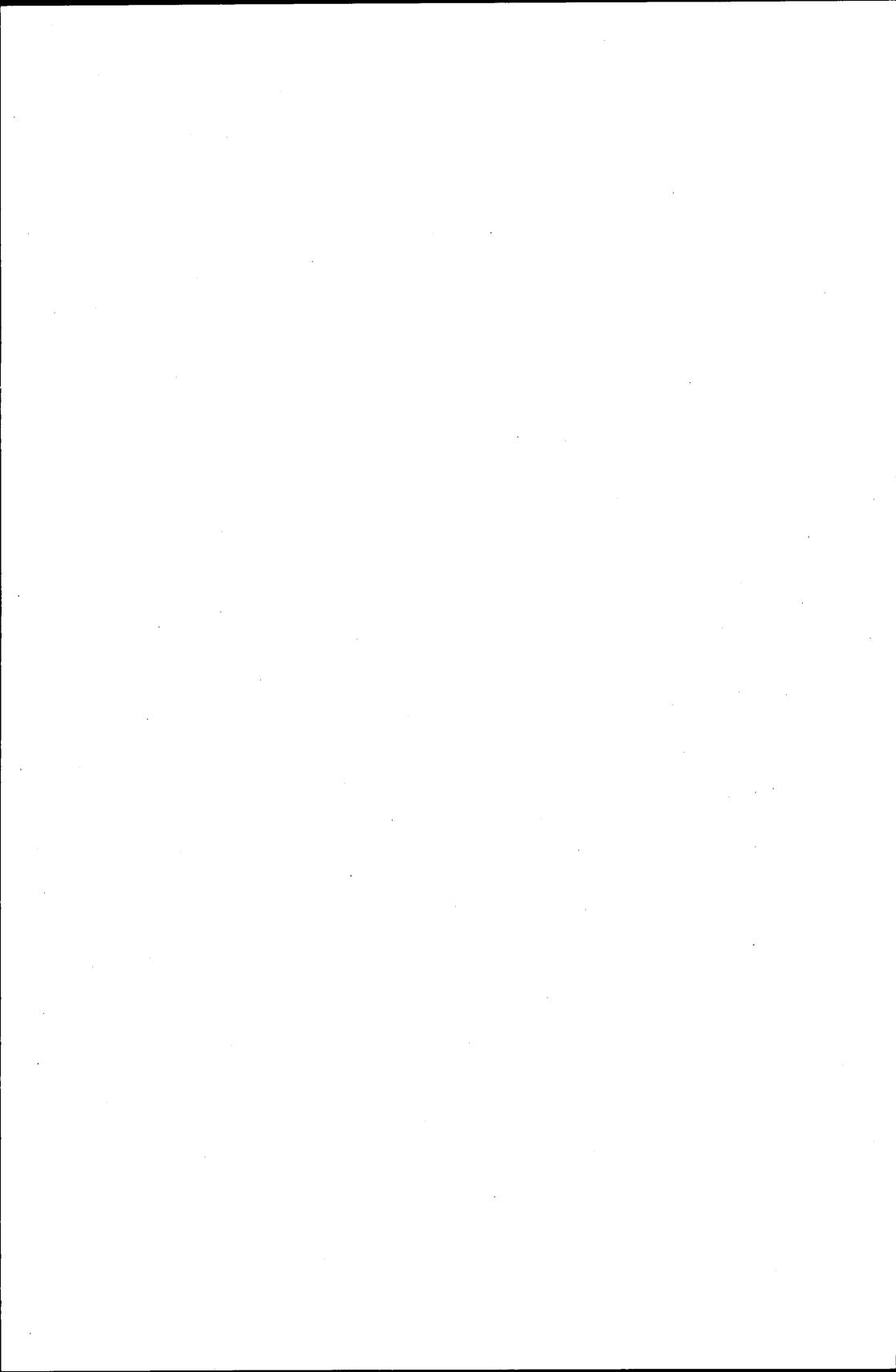
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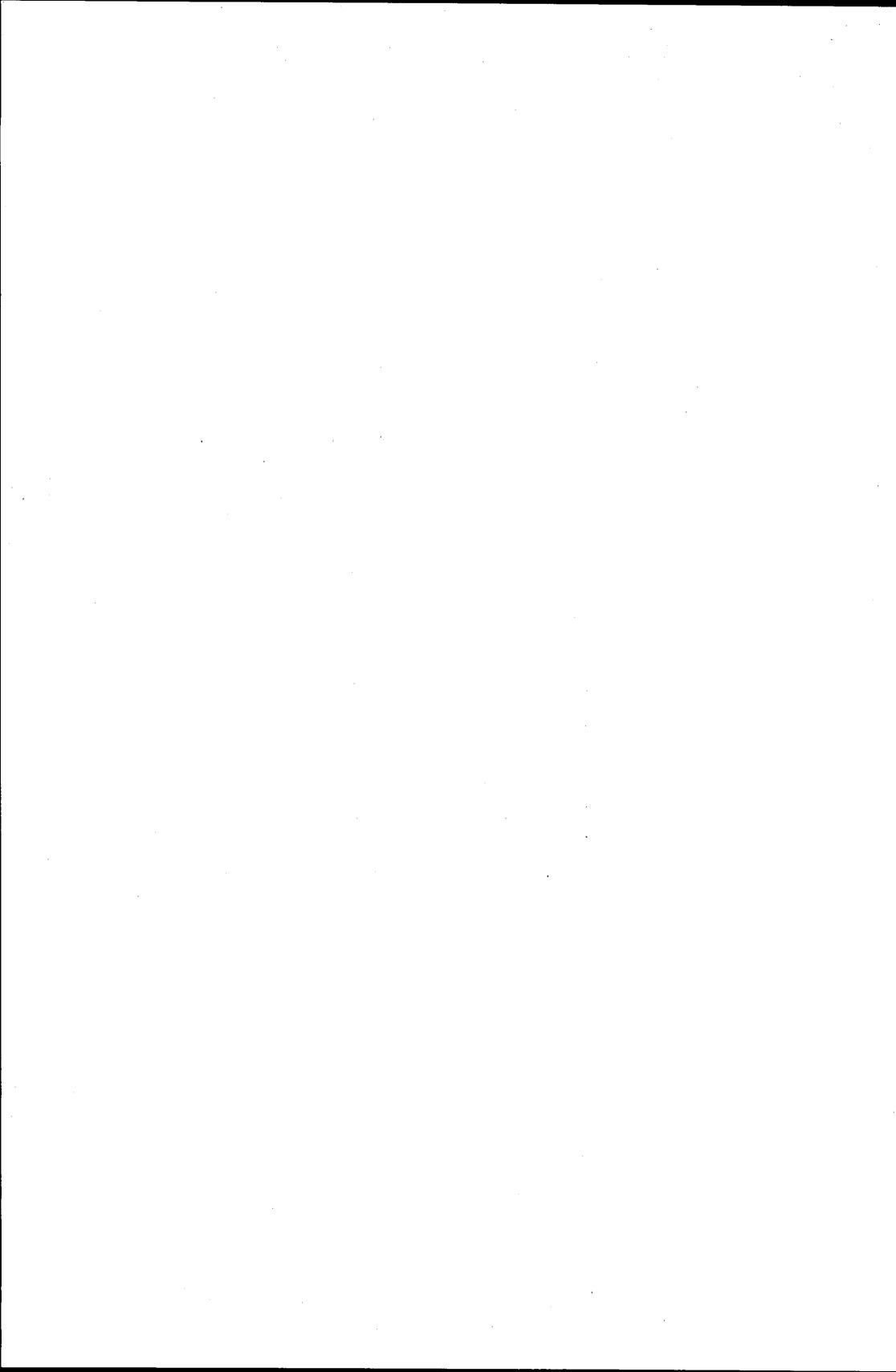
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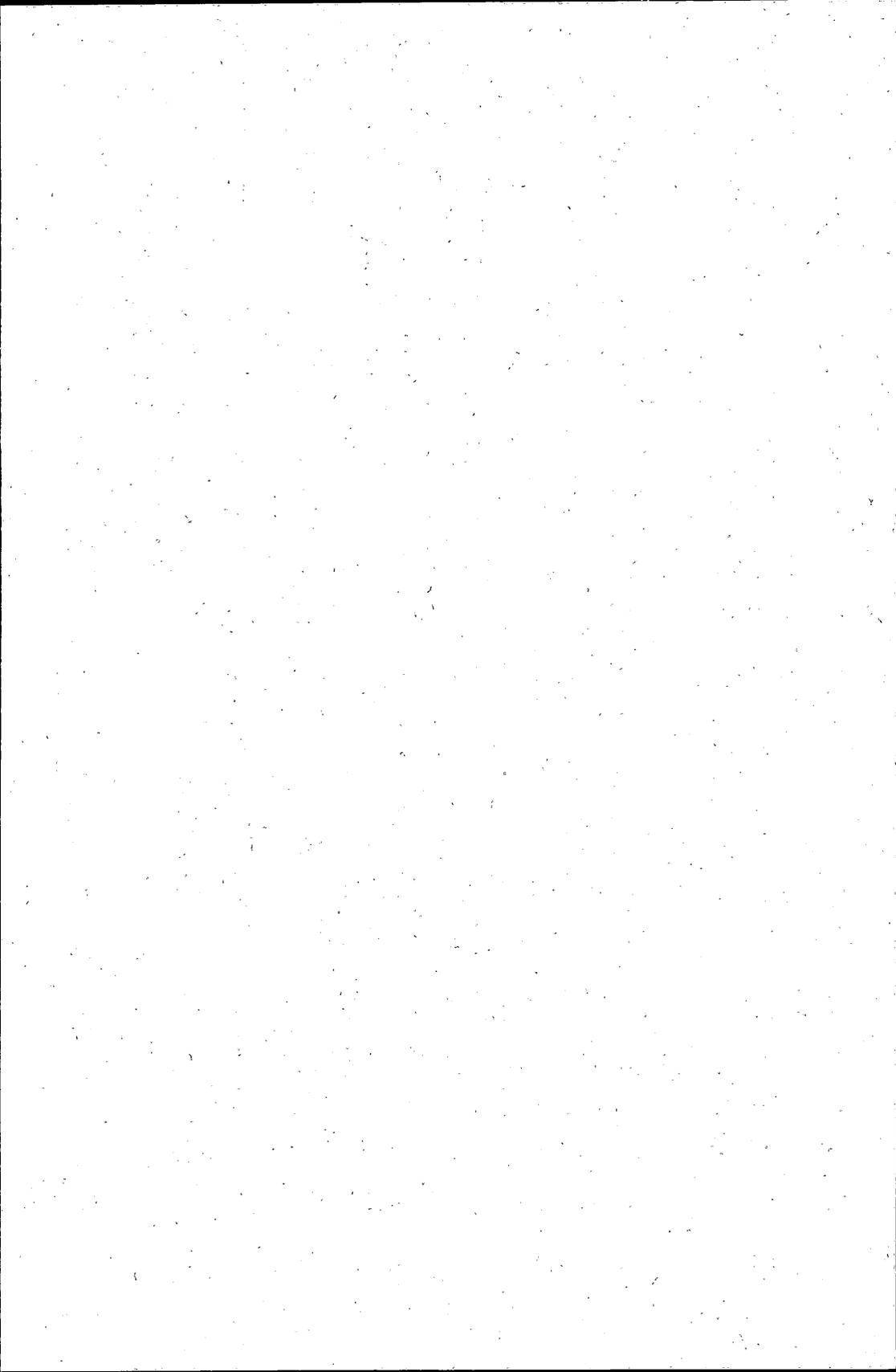
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