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DOMESTIC CONSEQUENCES OF EXPORT INSTABILITY

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DOMESTIC CONSEQUENCES OF EXPORT INSTABILITY

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At a time when general discussions of export instability abound, in terms of its nature, cause, effect, and possible correctives, it may be of interest to take an empirical look at the case of one country for the insights which it will provide. The example of Chile and its copper industry between 1925 and 1959 is presented to reveal some key relationships between stability of export earnings and economic growth as seen through the structural ties between the rest of the economy and its major industry.

The problem to be analyzed is the relationship between fluctuations in export earnings and the stability and growth of the export economy. Fluctuations are confined to short-run (one year) phenomena which are determined primarily by shifts in demand. If changes in the value of exports affect growth, it is mainly through their unstabilizing effect on the capacity to import and domestic demand of the export economy. Therefore the key to the relationship between export instability and economic growth lies in the relationship between the fluctuating value of export earnings and the changing level and composition of its domestic share.

This paper endeavors to show how such a relationship may be analyzed in order to determine the effect of instability in export earnings in the economy. To do so, it traces the following reaction path between the change in the value of export earnings and the change in the level of income: (1) change in the value of export earnings, (2) change in the value of export earnings retained in the economy, (3) change in the value of domestic expenditures for inventory accumulation in the export sector, (4) change in the distributive shares in the export industry, (5) change in the value of local purchases on capital account by the export sector, (6) change in the value of domestic foreign exchange earnings derived from the export sector (arising from 1 to 5 above), (7) change in domestic income, (8) implications of the foregoing for economic growth.

The results of this analysis indicate that stabilization policy which deals only with compensation for changes in the value of exports will tend to destabilize the system unless very special conditions hold for relationships 2 through 6 above. Stabilization policy, it will be shown, must first isolate the differential effects of changes in the value of ex-

ports on different income recipients. Some of these, including the government, may have greater destablizing effects on income than others. For policy to be effective, it must respond to different sectoral impacts of export fluctuations to insure maximum growth with stability. Therefore so-called "automatic" financing schemes designed to compensate countries for shortfalls in export earnings, if they are truly to promote stability and growth, cannot afford to be automatic either in terms of amount of financing or conditions under which financing would be made available.[1] In the process of reviewing the Chilean case the argument upon which these conclusions rest will become clear.

The Chilean Case 1925-59

Chile is a well-known example of an export economy, depending upon the proceeds of its copper industry for over 50 per cent of its foreign exchange and 8 per cent of its gross geographic product. Data on the value of copper exports may be disaggregated into the component retained in Chile and the share expatriated in the form of purchases of intermediate goods and services, profits and depreciation. Figures on local expenditures in the export sector for creation of stocks and capital formation are also available owing to recent research.[2] Without going into a detailed discussion of the industry and its impact on Chilean stability and growth, some relevant magnitudes will be presented to illustrate points mentioned above.

Copper is an export industry of fairly inelastic supply, due to the high ratio of fixed to variable cost and remoteness from population centers which tend to fix factor supplies in the short run. This makes the chosen example representative of a class of export economies for which analysis and policy must focus upon certain rigidities in the factor markets. Other export economies undoubtedly have relatively elastic supply functions in the short run due to availability of alternative employment for factors of production (e.g., the case of Indonesia where labor may shift between the production of rubber and rice).[3] Furthermore, large-scale copper mining in Chile is entirely foreign owned, permitting us to assume that the entire share of profits and depreciation in the value of export earnings is remitted abroad while local

[1] Automatic financing schemes to compensate for fluctuations in export earnings have been urged among others by the Committee of Experts of the U. N., *International Compensation for Fluctuations in Commodity Trade* (U. N., New York, 1961), Chap. 4, and Joseph D. Coppock, *International Economic Instability* (New York, 1962), Chap. 7.

[2] This paper is based primarily on information presented in a doctoral dissertation submitted by the author to the University of California at Berkeley in 1962: "Development Problems of an Export Economy: The Historical and Developmental Relationship of the Copper Industry to the Economy of Chile." Research for this study including residence in Chile was financed by a Doherty Foundation Fellowship.

[3] R. Nurkse, "The Quest for a Stabilization Policy in Primary Producing Countries," *Kyklos*, Vol. XI, 1958, Fasc. 2.

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gross investment expenditures of the industry are treated as exogenous. Some of the implications of relaxing these special conditions will be examined below.

Instability of Export Earnings

Chilean export earnings as measured by the value of copper sales have shown an average annual fluctuation of 22.1 per cent between 1926 and 1959.[4] This is the result of well-known instability in demand for the metal[5] plus inelasticity of supply (gross of inventory change) in the short run. Instability in export earnings affects the economy through payments to local owners of factors of production plus the government. Here the inventory policy of the export industry will play an important role in the degree of instability which is transferred into the domestic income stream from a given change in export earnings. Thus the first qualification to be made in attempting to assess the impact of a fluctuation in sales on the domestic economy is that the value of sales may not be the relevant determining variable. For that reason we use a figure representing the portion of export earnings accruing to the Chilean economy plus payment to factors of production employed in the creation of stocks.

Instability of Net Returned Value

The share of sales plus value of net inventory change retained in the economy may be termed "net returned value." This figure is net because it does not include payments to owners of local factors of production employed in capital formation by the export industry. This figure showed an annual fluctuation of 20.2 per cent during the same period—somewhat less than fluctuations in the value of sales. Moreover, in six of the thirty-four years the direction of change in returned value was of opposite sign from the value of sales. This illustrates that the instability of retained earnings in the export sector was less than the total value of sales owing to two important factors: (1) the profit share in the value of sales fluctuated more widely than any other com-

[4] Instability is measured in terms of the change in the value of the relevant variable between the present year and the past year divided by the value of the variable which is the greatest for the two years. An average is then taken of all percentage changes over the period considered, disregarding sign, and this gives the "average degree of instability." The measure used gives a downward bias to fluctuation and does not correct for trend. Nevertheless, it is the relative amount of instability which concerns us; so the measure is adequate for this purpose, particularly when the values of all variables show proportional secular changes. The figures for all relevant series fail to show significant serial correlation; percentage changes were negative in twelve of the thirty-four years for total sales, and in fourteen of the thirty-four years for net returned value, gross returned value and government revenue from the copper industry.

[5] United Nations Department of Economic Affairs, *Instability in Export Markets of Underdeveloped Countries* (New York, 1952); R. W. Ballmer, "Copper Market Fluctuations—an Industrial Dynamics Study," M. S. dissertation, M.I.T., 1960; O. C. Herfindahl, *Copper Costs and Prices: 1870-1957* (Johns Hopkins, 1959).

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ponent, and profits are not included in retained earnings because of foreign ownership; (2) the inventory policy of the export industry was essentially a stabilizing one for copper. The foregoing gains in importance when translated into absolute terms, since net returned value was less than total value of sales for every year except 1953 (during which large stocks were accumulated).

The importance of inventory policy as a stabilizer of incomes of local suppliers of labor, intermediate goods, and raw materials is revealed by looking at fluctuations in local operating expenditures. This important component of returned value (taxes form the remainder) showed smaller variations averaging 15.1 per cent over the period. Since operating expenditures including wages and salaries represented from 83 per cent of returned value (1925-31) to 45 per cent (1956-59), the stabilizing influence of inventory policy cannot be overlooked.

Furthermore, in ten of the thirty-four years for which data are available, the direction of change in operating expenditures was of opposite sign from the change in the value of exports. This illustrates that fluctuations in the value of exports are unreliable as a predictor of fluctuations in domestic factor returns.

Stability of Distributive Shares in Net Returned Value

While it is not possible fully to disaggregate returned value into returns to local land, labor, and capital, it is possible to divide returned value into its tax and nontax components. In this respect, operating expenditures represent the private share of the returned value of export earnings, while the public share includes direct taxes plus import duties and miscellaneous charges. In earlier years (1925-31) the government share of returned value was only 17 per cent while operating expenditures accounted for 83 per cent of the total. In recent years, however, the balance has shifted to 55 per cent taxes and 45 per cent operating expenditures (1956-59).

Under these circumstances, the transfer of instability of export earnings to instability in domestic income depends to a large extent on the instability of government income from the export sector and resulting government expenditure policy. Total government revenue from the copper industry (measured by year of payment) fluctuated by 32.8 per cent per year over the period! Furthermore, in ten of the thirty-four years, percentage changes in government receipts were of opposite sign from changes in the value of exports. That is because income taxes constitute the bulk of copper tax revenues and tax legislation is subject to frequent change, altering the incidence of direct taxa-

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tion independent of changes in the value of sales. There was also an approximate one-year lag between incidence and payment of taxation prior to 1946.

Since copper tax revenues fluctuate much more widely than operating expenditures in the export industry, one might expect to find the main source of instability in income to be the government. This would be particularly true if government expenditure policy were such that expenditures moved in parallel with taxation over the course of the export cycle or expenditures equaled tax receipts in boom years with deficits being run during declines in export earnings. For this to be true, of course, other tax receipts must remain constant or fluctuate in the same direction as copper taxes. In the first case, instability would be transmitted directly from the export sector to the domestic economy via destabilizing government expenditure policy—rising with full capacity and declining with excess capacity over the course of the trade cycle. In the second case, there would be an indirect transmission of instability via the foreign trade sector as government failed to maintain buffer funds of foreign exchange during peak years which could be drawn upon to support a sustained demand for imports during periods of decline in exports—this import demand resulting from sustained high levels of government spending through creation of a deficit.

To determine whether fluctuations in export earnings might have affected the stability of Chilean income and product via taxes and expenditure policy, let us examine (1) the relationship between fluctuations in taxation and fluctuations in gross geographic product and (2) the relationship between changes in copper revenues and changes in government expenditure. In only nine of the thirty-five years (1925-59) did Chilean gross product (measured in U.S. dollars) change in the opposite direction from changes in copper tax revenues, and in only two of these years (1927 and 1942) did copper tax receipts increase as gross product declined tending to stabilize the system. This information strongly suggests that there may be a relationship between the stability of copper revenues and Chilean income via government expenditure policy. The other relationship, between government copper revenues and government expenditure, reveals that in twenty of the thirty-one years for which estimates are available (1928-58) government expenditures moved in the same direction as copper revenues transmitting instability to the rest of the system, especially as revenues moved in the same direction as operating expenditures for all but five of those years. For eight of the other eleven years government expenditures rose while copper revenues declined.

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Had the government engaged in a conscious stabilization policy, it would have attempted to offset fluctuations in domestic income created by changes in operating expenditures of the export sector by running a surplus during periods of increasing revenue and a deficit during declines (this would amount, in effect, to a "buffer fund" of copper revenues in the form of foreign exchange). Yet in only eight of the thirty-one years do the statistics suggest such a policy.

Stability of Capital Formation in the Export Sector

Nevertheless, we have still not arrived at a figure which adequately represents the impact of the export sector on the domestic economy. To do this we must add to net returned value all local purchases by the export sector on capital account. This represents the total foreign exchange made available to the system from the export industry during a given year and is termed "gross returned value." It is, therefore, important to determine whether or not capital formation in the export sector tends to further destabilize the system.

The relationship between capital expenditures in the export sector (exclusive of capital goods imports) and value of exports depends upon the role of profits and sales in capital formation, including relevant lags. It is recognized that in many cases lags may be influenced by expectations which are directly related to political factors. This has been particularly true in the Chilean case in recent years.

In case where investment in the export industry is a function of profits and/or sales (the latter showed fair results in the Chilean case), one would expect capital expenditures to increase instability in income resulting from fluctuations in sales. This would be particularly true if local expenditures on capital account were a stable proportion of total investment expenditures in the export industry (a case which does not hold for the Chilean copper industry).

Nevertheless, fluctuations in gross returned value did not significantly exceed those of net returned value in our example, varying on an average of only 20.9 per cent per year. Moreover, in only two of the thirty-four years did gross returned value fluctuate in a different direction from net returned value (1927 and 1928). We see, then, that capital expenditures did not serve to further destabilize over-all domestic demand. Neither did they operate to increase stability. This is partly because local capital expenditures represented only a small percentage of net returned value (6.9 per cent between 1950 and 1959). One must not disregard the role of capital formation in the export sector, however, when weighing its potential unstabilizing effect on income. As economies develop, increasing their producers' goods production, the share of local expenditure in total capital formation of

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the export industry will tend to rise, increasing the effect of this factor on stability and growth.

Stability of Foreign Exchange Receipts

The best measure of foreign exchange provided by the export sector is not the value of sales or net returned value but gross returned value. This has been shown to depend upon sales plus inventory change plus local capital expenditures. It has been shown that gross returned value varies with net returned value in the Chilean case, but that the latter does not closely follow the value of sales because of stabilizing inventory policy. In cases in which governments desire to stabilize the foreign exchange available to importers through the creation of buffer funds during the boom periods which may be drawn upon during downswings in export earnings, the relevant variable should be gross returned value—and government revenues should be set aside to offset swings in this variable. Indeed, the government may even attempt to encourage stabilizing investment policy in the export sector for the foreign exchange which it would provide by encouraging capital formation during downswings in export demand. It should be noted here that the important variable is domestic expenditure on capital account, which could include construction of new housing for workers and other social overhead facilities which have a low import coefficient and employ labor displaced by cutbacks in production.[6]

Stabilization and Growth

The question of whether or not a stable domestic income stream and stable imports will produce an optimal rate of growth is yet unsettled. The answer depends upon the effect of instability in domestic and foreign demand on investment by the export industry, other industry and agriculture, and the government, and the effect of instability in the capacity to import on the price level, import requirements for growth, and the ability of the government and business to engage in long-range development plans which require a steady rate of capital formation.

In the export sector, some feel that a steady income stream will increase the share of income devoted to productive capital formation; others argue that short periods of very high profits will induce a greater share of income invested and that downswings will not cause this share to fall proportionally.[7] This would imply a ratchet mecha-

[6] It is important to note here that foreign exchange earnings should be deflated by an index of import prices to provide a capacity to import measure similar to the "income terms of trade." For a stable import stream, the buffer fund should in fact be related to fluctuations in this variable since it more accurately represents real purchasing power of export earnings.

[7] Sir Sidney Caine, "Instability of Primary Product Prices: A Protest and a Proposal," *Econ. J.*, Sept., 1954, and comments, *Kyklos*, 1958, *op. cit.*

nism which would insure a higher long-run rate of investment for the economy with cyclical behavior in its export sector than for a stable system. It is not possible to argue this point in terms of the Chilean case, since there has not been a period of stable export earnings of sufficient duration to draw any conclusions. It is, however, possible to point out that a high rate of reinvestment of profits from the sector has taken place consistent with very wide fluctuations in profits and sales. The largest investments were commenced during periods of rising profits and favorable market outlooks (1911-13, 1926-27, 1941, 1948-52, 1955-56). This implies that investors in the export industry regard upswings as beginnings of trends rather than as temporary phenomena and behave accordingly; downswings, on the other hand, are apparently considered short-run phenomena, since no major disinvestment occurred for any of the companies even during the severe depression of the thirties.[8] The result of this behavior is that net investment in the Chilean copper industry has represented 52 per cent of net profits between 1930 and 1959.

In the Chilean case there is no clear relationship between the stability of export earnings and growth. Although these did fluctuate widely between 1925 and 1959 and although the rate of growth of per capita income was very modest (cumulative annual rate of 1 per cent or less), this was perhaps less the result of instability in export earnings than of failure by the government to invest a steady or growing share of copper revenues in productive capital formation. Although copper revenues rose by 255 per cent over the period 1940-59, direct and indirect government investment expenditures increased by only 116 per cent. Furthermore, the share of total government revenue devoted to investment fell from 21 per cent in 1940 to 17 per cent in 1957. Annual government support of its major development institution, the Corporacion de Fomento de la Produccion (CORFO), only increased by 28 per cent in real terms between 1940 and 1958.

Policy Implications of the Chilean Case

One learns from the Chilean case that if the goal of commodity stabilization policy is domestic stability and maximum growth, it is neither appropriate nor sufficient to stabilize the value of export earnings (regardless of the difficulty of such an undertaking). That is because the net returned value and gross returned value derived from the export sector, which have a direct effect on domestic stability, do not necessarily depend directly upon the value of export earnings. More-

[8] During the period 1932-37, the average annual net investment was minus $1 million. Since the depreciated value of assets approximated $235 million during that period, this is not considered major disinvestment.

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over, fluctuations are transferred to the rest of the economy through changes in revenue accompanied by parallel changes in government expenditure (destabilizing domestic demand) or steady expenditure equal to peak year revenues (creating balance-of-payments problems and tending to destabilize real income).

It is suggested that it is this kind of behavior by government which introduces instability into the export economy, particularly where profits are remitted abroad either because the industry is foreign owned or because domestic owners have a high marginal propensity to import.[9] The destabilizing behavior of the government sector may well result from political pressures of powerful interest groups which have no direct concern for domestic stability or growth. Under these circumstances the government may be powerless by itself to engage in the type of stabilization policy necessary to achieve these ends. It is here that international stabilization policy may operate in conjunction with the government to permit compensatory fiscal policy in the following manner: (1) an international lending agency (such as the IMF) could provide funds during the decline in export tax revenues equal to a percentage of the deviation around the long-run trend, (2) the agency would require an agreement by the government that the share of government investment expenditures not be cut during a decline in export revenues, (3) the international agency would obtain an agreement from the government to repay its borrowings during an upswing in export revenues. The proposal would, in effect, permit the government to engage in the kind of compensatory fiscal policy which is most consistent with stability and growth while transferring the domestic political pressure against such policy from the government to the international agency.

This proposal differs from current policy of the IMF in that (1) it is designed to meet the problem of instability at its source (fluctuation in government revenue and expenditure) rather than at the point of decline in over-all export earnings or when balance-of-payments deficits arise, (2) it is designed to be used as a tool of the government to transfer political responsibility for stabilization policy from itself to the international lending agency, (3) it is to be used explicitly as a tool of economic development as well as stabilization by permitting the government to engage in a steady rate of capital formation.

Coupled with this policy, which deals with instability produced by fluctuations in government spending, could be a policy to cope with instability arising from private payments in the export sector. Here financing could be made available to permit the export industry which

[9] For a similar example of destabilizing government expenditure policy in Malaya, see Sir Sidney Caine references, *op. cit.*

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has inelastic factor supplies to engage in the formation of buffer stocks in cases in which this policy is not already being undertaken privately.

Conclusion

Instability is primarily transferred from export earnings to the export economy in the Chilean case by way of destabilizing tax and expenditure policy of the government. The relative destabilizing effect of government tax and expenditure policy in the export economy is likely to increase as one or more of the following factors gain in importance: (1) the export industry is foreign owned, (2) the share of profits of the export industry which are expatriated rises, (3) the profits share of the export sector grows, (4) the government shifts from indirect to direct taxation of the export industry, (5) the rate and degree of progressiveness of direct taxation rises in the export industry, (6) the elasticity of substitution between factors employed by the export sector and factors employed by the rest of the economy declines, (7) the natural resource intensity of the export industry rises, (8) government expenditure tends to equal government revenue, (9) government investment expenditure is a fixed share of government revenue from the export industry, (10) the local expenditures share of export industry investment declines, (11) the local investment expenditures of the export industry show a greater lag as a function of profits and/or sales.

Whenever the main source of instability is traced to the government sector, international stabilization policy should be directed toward the encouragement of compensatory fiscal policy related to fluctuations in export revenues and designed to insure not only stability but growth. Here the international agency should be consciously designed to bear the responsibility for such policy when it engenders political friction.

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