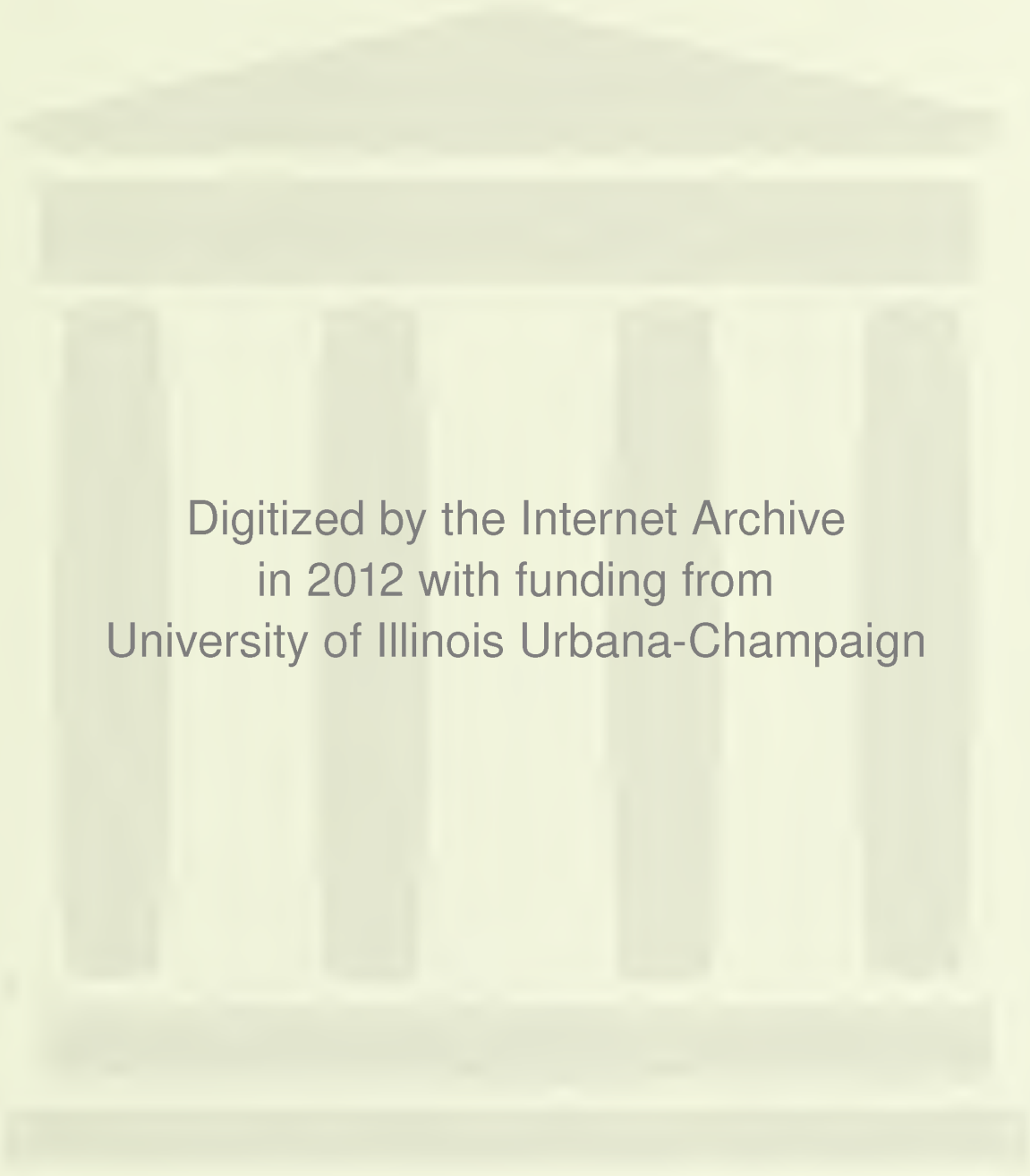

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FACULTY WORKING PAPER NO. 1305

Bertil Ohlin's Contributions to Economic Theory

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November 1986

"Bertil Ohlin's Contributions to Economic Theory"

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BERTIL OHLIN'S CONTRIBUTIONS TO ECONOMIC THEORY

By HANS BREMS

104-WORD ABSTRACT

Inspired by Cassel and Heckscher Ohlin formulated the theorem that even if no factor ever crossed a border, perfect mobility of goods among regions would equalize real factor prices among them. Few theorems have inspired as much later work, theoretical and empirical, as this so-called Heckscher-Ohlin theorem.

Less well-known is Ohlin's macroeconomics, never fully translated. Here, inspired by Wicksell and Lindahl, Ohlin built a dynamic feedback mechanism between consumption, investment, and output. Two years ahead of Keynes, Ohlin's feedback mechanism used three Keynesian tools, the propensity to consume, liquidity preference, and the multiplier, and one non-Keynesian tool, the accelerator.

The New Palgrave

BERTIL OHLIN'S CONTRIBUTIONS TO ECONOMIC THEORY

By HANS BREMS

Ohlin was born on 23 April 1899 in Klippan, Sweden. He took a degree in mathematics, statistics, and economics at the University of Lund in 1917, a degree in economics under Heckscher at the Stockholm School of Business Administration in 1919, an A.M. degree under Taussig and Williams at Harvard in 1923, and a Ph.D. degree under Cassel at the University of Stockholm in 1924. Ohlin taught at the University of Copenhagen 1925-30 and, as Heckscher's successor, at the Stockholm School of Business Administration 1930-65. He was a visiting professor at the University of California at Berkeley in 1937 and at Columbia and Oxford in 1947.

For the League of Nations Ohlin prepared a report on the world depression in 1931 and for the Swedish government a report on unemployment in 1934. He was a member of the Swedish parliament

1938-70, a cabinet member 1944-45, the leader of the liberal party 1944-67, and died on 3 August 1979 in Stockholm.

X Trade theory

Ohlin is best known for, and received the 1977 Nobel Prize for, his modernization of the theory of international trade. The modernization was long overdue: discredited in general economic theory after 1870, the labour theory of value was still surviving in the province of international-trade theory half a century later.

Ohlin's teacher at Stockholm was Gustav Cassel, and his point of departure was Cassel's (1918) version of a Walrasian general equilibrium of a closed economy with perfect mobility of goods and factors. Unlike Walras, Cassel assumed the factor endowments of all households to be fixed. Household income would then be the sum of the products of factor price and all factor endowments of that household. Like Walras, Cassel assumed the input-output coefficients of all goods to be fixed. The competitive price of a good would then be the sum of the products of factor price and all input-output coefficients of that good. Facing such household income and such competitive goods prices, every household would reveal its preference. Goods-market equilibrium would require industry supply and such household demand to be equal

for every good. Industry demand for a factor would be the sum of the products of such industry goods supplies and all input-output coefficients of that factor. Factor-market equilibrium would require household supply and such industry demand to be equal for every factor.

The ultimate determinants of all quantities and relative prices in such a general equilibrium were, first, factor endowments; second, technology in the form of the input-output coefficients; and, third, preferences. Inspired by his other teacher at Stockholm, Eli Filip Heckscher (1919), Ohlin (1924), (1933) set out to modify the Cassel model to fit interregional and international trade.

As his first modification Ohlin visualized an economy composed of regions within which factor mobility was perfect but between which it was imperfect or, as a first approximation, nonexistent. In the absence of goods trade, isolation would be complete, and such regions would simply constitute a system of miniature Casselian closed economies. Between them relative prices could differ because factor endowments, technology, or preferences differed. As another first approximation, Ohlin assumed regions to differ solely in their factor endowments, not in their technology or preferences. Finally, Ohlin unfroze Cassel's fixed input-output coefficients, thus making room for factor substitution. With such assumptions he had the ingredients to

what later became known as the 'strong' Heckscher-Ohlin theorem. In the simple case of two factors, two goods, and two regions the theorem becomes very tractable. In isolation each region would have a relatively low-priced and a relatively high-priced good. Since nothing else than factor endowments differed between regions, the low-priced good would be low-priced because it required relatively much of that region's relatively abundant, hence low-priced, factor. That good will be a candidate for export once we remove isolation. The high-priced good would be high-priced because it required relatively much of that region's relatively scarce, hence high-priced, factor. That good will be a candidate for import once we remove isolation; but we are not removing it yet. As we know, under profit maximization, pure competition, and factor substitution the physical marginal productivity of either factor in terms of either good will equal the real price of that factor in terms of that good.

Now remove isolation and let goods be traded. Export would expand a region's demand for its abundant factor and import reduce the demand for its scarce factor. Thus trade would raise the price of the abundant factor, reduce the price of the scarce one, and encourage substitution between them: either good would use less abundant factor per unit of scarce factor than in isolation. The abundant factor would then have a higher physical marginal productivity and a higher

real price in terms of either good than in isolation. Vice versa for the scarce factor. Does all this mean that trade would eventually equalize real factor prices in terms of either good between regions--although no factor ever crossed the border? Yes, in the absence of transportation costs and in the absence of specialization. One reason for specialization would be increasing returns to scale. Specialization would leave a region with an unproduced good. Where nothing is produced, no factor can have a marginal productivity. In terms of the unproduced good, then, physical marginal productivity could no longer equal real factor price, and the theorem would fail. So it would in case of transportation costs or in case regions differed, not in factor endowments but in technology or preferences. And so it might if there were more than two factors, goods, or regions.

Few theorems have been as fruitful, i.e., inspired as much later work, theoretical and empirical, as the Heckscher-Ohlin theorem. Neither Heckscher nor Ohlin applied present-day rigour. To Heckscher factor-price equalization would be complete; to Ohlin--more aware of the many qualifications--incomplete. The theorem was first taken up, baptized, and rigourized by Stolper and Samuelson (1941) who examined a scarce factor's case for protectionism but found 'the definiteness of the Heckscher-Ohlin theorem [beginning] to fade' with more than two

factors. More groundwork was done by Samuelson (1948), (1949). Using his domestic U.S. input-output table with many goods but only two factors, Leontief (1953), (1956) found the capital-labour ratio to be lower in U.S. exports than in U.S. import-competing goods. If the Heckscher-Ohlin theorem were true, then, capital would have to be the scarce and labour the abundant U.S. factor. This Leontief paradox did not make the theorem go away but stimulated new contributions. A good guide to them is the third part of Chipman's (1966) survey of the theory of international trade.

Ohlin's second modification of Cassel saw international trade as a special case of interregional trade. What was special about nations?

First, national differences in factor endowments, technology, and preferences might be rooted in differences in climate, language, cultural, and legal institutions. Of international movements of factors, labour as well as capital, and such obstacles to them Ohlin gave a full account. His account of international capital movements found an early and specific expression (1929) in his discussion with Keynes of the mechanism of the reparation payments imposed upon Germany by the Versailles treaty. Still influenced by Marshallian tradition, Keynes saw a drastic worsening of Germany's terms of trade as a necessary condition for such payments. To Ohlin reparations were

nothing but huge international transfers of 'buying power.' Against an incomprehending 1929 Keynes, Ohlin advocated the view of a 1936 Keynes, i.e., the income mechanism would do; no price mechanism was needed.

Second, nations were special in having their own currency and monetary authorities. In a two-country world such separate currencies would add a new unknown, i.e., the price of one currency in terms of the other--the exchange rate. Fortunately there would also be a new equation, i.e., the equilibrium condition that in a pure-trade model the balance of trade would be zero or that in a trade cum lending and borrowing model the balance of payments would be zero.

X Macroeconomic theory

Less well known to the English-speaking world is Ohlin's macroeconomic theory: its most important work (1934) was never fully translated. Here, Ohlin was inspired by Wicksell and Lindahl.

Wicksell (1893) had restated Böhm-Bawerk mathematically and (1898) wondered how a Böhm-Bawerk 'natural' rate of interest was related to the rate of interest observed in markets where the supply of money met the demand for it. If such a 'money' rate of interest were lower than the natural rate of interest, entrepreneurs would be induced--and the

money supply correspondingly expanded--to pay a higher money wage rate. Physically speaking, nothing would come of this, for when labour spent the higher money wage rate, prices would rise correspondingly and unexpectedly leave the real wage rate unchanged. There would be a cumulative process of inflation expected by nobody.

Wicksell's answer was made possible by a method fundamentally new in three respects. Wicksell's method was a macroeconomic, dynamic disequilibrium method based upon adaptive expectations whose disappointment constituted the motive force of the system. But Wicksell had applied his method to a model with price as the only variable. Using Wicksell's method and inspired by Lindahl's (1930) refinement of it, Ohlin (1933), (1934) added physical output as an additional variable. Two years ahead of Keynes, Ohlin used three Keynesian tools, i.e., the propensity to consume, liquidity preference, and the multiplier, and one non-Keynesian tool, i.e., the accelerator. The four tools would interact as follows in Ohlin's feedback mechanism. Let consumption demand be stimulated. As a result physical output would rise, generating new income. The propensity to consume would link physical consumption to the level of physical output and thus establish a consumption feedback. The accelerator would link physical investment to the growth of physical output and thus establish an investment feedback. As did the

Wicksellian one, Ohlin's two feedbacks unfolded in a cumulative process along a time axis as a succession of disequilibria: expectations and plans were forever being revised in the light of new experience. By contrast, Keynes used only the consumption feedback and telescoped it into an instant static equilibrium along an output axis.

Ohlin's relation to Keynesian economics was discussed by Steiger (1976), Patinkin (1978), and Brems (1978). Forty-one years apart Ohlin expressed his own view on the matter in (1937) and (1978).

Ohlin's (1934) analysis appeared in a report on unemployment requested by the Swedish government, and his policy conclusions were quite specific. In times of excess capacity the government should undertake investment projects--say highway construction or the electrification of state railroads--which would not compete with private investment and which should be allowed to generate fiscal deficits. Tax financing would reduce consumption and thus defeat the purpose of public works. Ohlin wrote the government budget constraint: deficits might be financed by expanding either the bond or the money supply. Sale of government bonds would depress bond prices and thus discourage private investment, again defeating the purpose of public works. That left central-bank discounting of treasury bills as the only way which would not deprive private investment of finance. Thus

financed, public works would generate income. Such income generation would be magnified by the multiplier and the accelerator.

Except for a nine-page algebraic two-country Cassel general equilibrium, banished to an appendix, Ohlin used neither algebra nor diagrams. But in all his work his style was accurate, cautious, and lucid, often enlivened by relevant statistical and historical illustrations.

Hans Brems

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