ment of prices. The connection between the network of enterprises and businessmen working out in distant regions became reinforced through the public diffusion of economic statistics such as prices composites, aggregate index of commodities, and wholesale price indices published by several U.S. newspapers. At the beginning of the twentieth century important nongovernmental institutions also set up solid reputations in the release of weekly and daily series of index numbers. The first official initiatives came out almost simultaneously in the United States (1902) and in Europe (United Kingdom, 1903), in response to parliamentary investigations into the effects of laws and tariffs on domestic prices. Japan saw the establishment of a Wholesale Price Index of Tokyo City in 1897, through the initiative of the Bank of Japan.

A major drawback of these pioneer undertakings was the proliferation of methods for computing the average price of the commodities, and also the limited coverage given by price quotations. The introduction of a system of weighting, combined with an enlarged sample of goods taken from widely distributed markets, under the responsibility of the United States Bureau of Labor Statistics in 1914 marked a new phase in the credibility of governmental agencies. Up to the present time, the formula that closely approximates the computation procedures in use around the world for weighting the "basket of commodities" comprised in the Wholesale Price Index is some variant of the index formula suggested by Etienne Laspeyres in 1871. Thanks to these developments, the scope of the Wholesale Price Index is additionally extended from a micro benchmark indicator and a reference for escalating purchase and sales contracts to a macroeconomic indicator for the formulation of fiscal and monetary policies, and to a deflator used to adjust economic time series.

SEE ALSO *Inflation; Price Indices; Prices*

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WICKSELL EFFECTS

The term *Wicksell effects* was introduced by Joan Robinson (1953, p. 95) during a debate in the theory of capital (see Kurz and Salvadori 1995, chapter 14). There is a distinction between *price Wicksell effects* and *real Wicksell effects*

(henceforth, PWE and RWE). A PWE relates to a change in relative prices corresponding to a change in income distribution, given the system of production in use. A RWE in addition takes into account the problem of the choice of technique. The "changes" under consideration refer to comparisons of long-period equilibria.

Knut Wicksell (1954; 1934, pp. 147–151) discussed these effects within an "Austrian" framework of the analysis, which conceives of production as a one-way avenue of finite length leading from the services of original factors of production, in particular labor, via some intermediate products to consumption goods. Before Wicksell they had been studied by the classical economists, especially David Ricardo (*Works* I, pp. 30–43), who wrote that relative prices depend on income distribution because of the "variety of circumstances under which commodities are actually produced" (*Works* IV, p. 368). This in conjunction with the fact that "profits [are] increasing at a compound rate … makes a great part of the difficulty" (*Works* IX, p. 387). Ricardo also tackled the problem of the dependence of the chosen technique on distribution in his disquisitions on rent and on machinery (1951–1973). The classical economists and Karl Marx typically conceived of production as a *circular flow* where commodities are produced by means of commodities.

The source of PWEs can be illustrated by expressing the ratio of the prices of two commodities, *A* and *B*, by means of their "reduction to dated quantities of labour" (Sraffa 1960, chapter VI). Call p_a and p_b the prices of one unit each of two commodities, w the wage rate per unit of labor (paid *post factum*), and r the rate of interest (or profits). Then we have

$$\frac{p_a}{p_b} = \frac{wl_{a0} + (1+r)wl_{a1}}{wl_{b0} + (1+r)wl_{b1}}$$

$$\frac{+ (1+r)^2 wl_{a2} + \ldots}{+ (1+r)^2 wl_{b2} + \ldots}$$

$$\frac{+ (1+r)^n wl_{an} + \ldots}{+ (1+r)^n wl_{bn} + \ldots}$$

(On the RHS of the equation w could be eliminated.) Obviously, l_{a0} (l_{b0}) gives the amount of labor expended directly on the last stage of producing one unit of commodity a (b); l_{a1} (l_{b1}) the amount expended directly on the last but one stage; and so on. Whereas with the Austrian concept each series is finite, with the classical circular flow concept it is infinite. Because for a given system of production the rate of interest and wages are inversely related (as has already been established, albeit imperfectly, at the

time of the classical economists), a change in distribution typically affects the prices of the two commodities differently: It all depends on how the total amounts of labor expended are distributed over time—whether or not relatively much labor is expended in early periods of time and little in later ones. Because with a rise of w and the corresponding fall of r the size of each term in each of the reduction equations (except the first one) is pulled in different directions, the overall effect of a change in distribution on relative prices depends on how the time patterns of the labor inputs compare with one another, with compound interest as a magnifier.

With a choice of technique, a change in the real wage rate may prompt cost-minimizing producers to change the methods of production to produce the various commodities. This brings us to the concept of RWE. In order to be able to compare the new situation with the original one, it has to be assumed that in both situations the same net output is produced; typically the economy is taken to be in a stationary state both before and after the change. The questions to be answered are: (1) which technique will be chosen in the new situation?; (2) what will then be the level of the other distributive variable and the set of normal prices?; and, most importantly, (3) is it possible to say anything definite about how the two situations compare with one another?

To illustrate RWEs, we may refer back to the equation above, but now A and B stand for two different processes of production of a *given* commodity available to producers. In competitive conditions the method chosen will be the one that allows one to produce the commodity at lower unit costs and thus a lower price.

Marginalist theory, of which Austrian theory is but a variant, maintains that both effects are positive. A *positive PWE* means that with a rise (fall) in the rate of interest, consumption goods will become relatively more (less) expensive compared with capital goods. The reason given is that consumption goods are said to be produced more capital intensively than are capital goods, because consumption goods emerge at the end of the production process, whereas capital goods are intermediate products that gradually "mature" towards the final product. The higher (lower) the rate of interest, the less (more) expensive the intermediate products in terms of a standard consisting of a (basket of) consumption good(s). At the macro level of a stationary economy (in which the net product contains only consumption goods), this implies that with a rise in the rate of interest, the value of the net social product rises relatively to the value of the aggregate of capital goods employed. Clearly, seen from the marginalist perspective, a positive PWE with regard to the relative price of the two aggregates under consideration involves a negative relationship between the aggregate

capital-to-net output ratio on the one hand and the interest rate on the other. Let $K/Y = \mathbf{x}\mathbf{p}(r)/\mathbf{y}\mathbf{p}(r)$ designate the capital-output ratio, where $\mathbf{x}$ is the row vector of capital goods, $\mathbf{y}$ the row vector of net outputs, and $\mathbf{p}(r)$ the column vector of prices (in terms of the consumption vector) which depends on r; then the marginalist message is:

$$\frac{\partial(K/Y)}{\partial r} \leq 0 \qquad (I)$$

Because for a given system of production the amount of labor is constant irrespective of the level of the rate of interest, the ratio of the value of the capital goods and the amount of labor employed, or capital-labor ratio, K/L, would also tend to fall (rise) with a rise (fall) in the rate of interest:

$$\frac{\partial(K/Y)}{\partial r} \leq 0 \qquad (II)$$

This is the first claim marginalist authors put forward. The second is that RWEs are also positive. A *positive RWE* means that with a rise (fall) in the rate of interest, cost-minimizing producers switch to methods of production that generally exhibit higher (lower) labor intensities, "substituting" for the "factor of production" that has become more expensive—"capital" (labor)—the one that has become less expensive—labor ("capital"). Hence (II) is said to apply also in this case. The assumed positivity of the RWE underlies the marginalist concept of a demand function for labor (capital) that is inversely related to the real wage rate (rate of interest).

Careful scrutiny of the marginalist argument has shown that it cannot be sustained generally: There is no presumption that PWEs and RWEs are invariably positive. In fact, there is no presumption that techniques can be ordered monotonically with the rate of interest (Sraffa 1960). As Mas-Colell (1989) stressed, the relationship between K/L and r can have almost any shape. The finding that PWEs and RWEs need not be positive challenges the received doctrine of the working of the economic system as it is portrayed by conventional economic theory with its reference to the "forces" of demand and supply.

SEE ALSO *Cambridge Capital Controversy; Capital*

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Heinz D. Kurz

WIDOW'S CRUSE

The term *widow's cruse* was first used in economics by John Maynard Keynes (1930, p. 139) in the presentation of his fundamental equations. Keynes argued that enterprise macroeconomic profits, as he defined them there, or what we would now call "business retained earnings," moved up one-to-one with increases in investment and increases in consumption out of profits. Thus, Keynes argued that "however much of their profits entrepreneurs spend on consumption, the increment of wealth belonging to entrepreneurs remains the same as before. Thus profits, as a source of capital increment for entrepreneurs, are a widow's cruse which remains undepleted however much of them may be devoted to riotous living" (p. 139). Keynes was then making a reference to the Old Testament story (1 Kings 17) in which a widow was assured that her barrel of meat and jar of oil would never be depleted.

The analogy was later picked up by Nicholas Kaldor (1956), when he presented his Keynesian theory of income distribution and growth. Both Keynes (1930) and Kaldor (1956) assumed full employment. For both of them, lower propensities to save would lead to an increase in prices relative to costs, and this would entail higher profits in the static case of Keynes and higher profit share and profit rates in the dynamic case of Kaldor.

In the meantime, another version of the widow's cruse was put forward by Michał Kalecki (1942), without the full-employment assumption, based on adjustments through quantities (real output and employment) rather than prices. Kalecki's equation reads that *Profits = Investment + Consumption Out of Profits*, under the classical assumption that wages are all spent. Taking the public sector into account, government deficit should be added to the right-hand side. Kalecki's equation has given rise to the aphorism—attributed to Kalecki, but which can be found in Kaldor (1956, p. 96)—that "capitalists earn what they spend, and workers spend what they earn." This aphorism shows the asymmetry in capitalist relations:

Capitalists can always decide to spend more (provided banks accept to finance additional investment), whereas workers cannot decide to earn more, because this depends on the employment they are offered by entrepreneurs. Modern versions of this quantity-adjusting theory can be found in the so-called Kaleckian models of growth, which show that a decrease in the propensity to save leads to higher rates of output growth and higher rates of profit.

The widow's cruse is the price-adjusting equivalent of the quantity-adjusting paradox of thrift. With output adjusting through the multiplier, the short-run version of the paradox of thrift asserts that individual efforts to increase saving will be useless, and that, instead, output will fall, as was outlined by Keynes in 1936. But this is simply the quantity analogue of the mechanisms he was describing in 1930 as the "Danaid jar," which can never be filled up, or the "banana parable," whereby a thrift campaign in a banana-producing economy will lead only to rotten bananas, heavy business losses, large unpaid bank loans, and destroyed wealth.

The widow's cruse is just as relevant now as it was at the eve of the Great Depression. Mainstream economists and right-wing think tanks are still chanting the virtues of household savings and government budget surpluses, without realizing that household expenditures have sustained the U.S. economic boom and that government deficits add to business profits. The issue of public pension-funds finance is also related to the widow's cruse, which implies that such funds can only be financed as a pay-as-you-go redistribution mechanism: If one attempts to save too much, the savings will vanish like the rotten bananas.

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WILLIAMS, ERIC
1911–1981

Eric Eustace Williams was chief minister, premier, and prime minister respectively of Trinidad and Tobago from 1956 to 1981. He was also one of the Anglophone Caribbean's first professionally trained historians. Several outstanding self-trained historians preceded him. Edward