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Coffee Consumption and Prices in the United States

By Rex F. Daly

The current situation and prospects for coffee are of widespread interest to American consumers and to those who supply them, and it is of vital interest to the many Latin American countries that depend on coffee as a primary source of foreign exchange earnings. The smaller per capita use of coffee in the United States in 1956 and 1957, and the rising world production and stocks, combined to reduce prices of coffee during 1957 and early 1958. The trade, foreign producers, and foreign and U. S. Government administrators have a continuing interest in the analysis and measurement of factors that influence world demand and prices of coffee. The purposes of this paper are (1) *to report some research on statistical analyses of the major economic factors that influence U. S. consumption and wholesale prices of coffee, and* (2) *to use these analyses in appraising the current situation and prospective trends in coffee consumption in the United States. This study was prepared by the author in connection with a short assignment in February this year with the Nicaraguan Government. Their Government was interested in the probable future expansion of the U. S. market for tropical products that can be grown in Nicaragua.*

CONSUMERS in the United States use more coffee than do those in any other country. In 1956 and 1957, we imported about 21 million bags of coffee. United States imports in 1957 made up 62 percent of coffee exports from Brazil, and 86 percent of Colombia's and more than a third of Africa's exportable production. Our imports represented about 42 percent of the world crop in 1955 and about 46 percent of the smaller 1956 crop.

Coffee is a major beverage in the diet of some 120 million adults in the United States. Outlays for nonalcoholic beverages in the average household in 1955 made up around 5 or 6 percent of expenditures for food, and coffee accounted for about two-thirds of the expenditures for beverages. In 1956 and 1957, the average adult (15 years and over) consumed about 22 pounds of coffee (in terms of green beans). This compares with an average of more than 24 pounds consumed in the postwar years 1947–49.

Consumption of Coffee in the United States

The major factor that influences United States requirements for coffee is growth of the population. But per capita use depends on relative prices for coffee, consumer incomes, and many other considerations, including habit, custom—such as the American coffee break—and the development of substitutes.

Big supplies of coffee, relatively low prices, and limited overseas shipping due to wartime conditions apparently contributed to a sharp increase in coffee consumption in the United States during World War II. Since the war, relatively high

prices have encouraged the development of substitute products and coffee extenders, as well as greater efficiency in the preparation and use of coffee.

Factors Influencing Per Capita Use

For this analysis, per capita use of coffee (green bean equivalent) per person 15 years and older was calculated (*1 p. 113*).[1] Changes in per capita use were appraised relative to changes in retail prices of coffee and consumer incomes. Several other variables, including lagged consumption and trend, were tried but they did not improve the analysis. Use of trend to explain differences in consumption from prewar to postwar years appeared to introduce a doubtful income elasticity of demand. This is explained in another section.

A single equation demand function was assumed for these analyses. In effect, our analyses state that per capita use of coffee in the United States was a function of changes in relative prices for coffee and real incomes of consumers. Consumers are faced with a price for coffee that they are only partly responsible for determining. Price reflects also the general world supply situation and demand for coffee in other importing countries as well as exporting countries. Probably the supply facing United States consumers is fairly elastic, but as our consumers take two-fifths of exportable production this country plays an influential role in determining world prices for coffee.

The demand function was assumed to be logarithmic in order to show relative or proportionate relationships among the variables. Data were fitted for 1922–41 and 1947 to 1957 (excluding the Korean War years, 1950 and 1951) and for the entire period combined. The following relationships based on the 1922–41 period are believed to be a reasonable approximation of consumer behavior in the last 3 or 4 decades.

$$\log q = k + b \log p + c \log I$$

$$\log q = 1.034 - \underset{(0.041)}{0.258} \log p + \underset{(0.072)}{0.226} \log I \qquad (1)$$

$$R_{1.23} = 0.88$$

In this relationship, (q) represents civilian use of coffee (green bean equivalent) per person 15 years and over, (p) is retail price of coffee deflated by the consumer price index, and (I) is real per capita consumer income.

Price and Income Elasticity of Demand

Price elasticity of demand (b) indicates that, with an increase of 10 percent in the relative price of coffee, consumers tend to reduce per capita use by about 2½ percent. A 10-percent rise in real consumer incomes usually leads to an increase of nearly 2½ percent in per capita use of coffee—an income elasticity of demand of +0.23 represented by (c) in equation (1).[2]

The price effect on consumption—price elasticity of demand coefficient—was fairly stable in the prewar and postwar analyses around −0.25 to −0.30 whether using a trend variable or lagged consumption. Indicated price influence on consumption in these analyses are reasonably consistent with those in a recent study regarding coffee made by the Food and Agriculture Organization of the United Nations (*2, p. 8*), but they indicate a smaller price influence than that reported in a recent Federal Trade Commission report on coffee (*3, p. 510*).

Income elasticity of demand indicates the way consumers usually modify their consumption in response to changes in income. As indicated above, it was 0.23 in the prewar period. A smaller income effect (0.10) was indicated for the postwar years, but the results were not statistically significant. And when a trend variable was used in the postwar years, the results were completely illogical with a negative income effect. An analysis for the entire period suggested a much higher income effect (around 0.5 or higher) with or without the trend variable. The FAO study (*2, p. 8*) reports an income elasticity of demand around 0.55, whereas the FTC study (*3, p. 510*), based on relative changes in variables from year-to-year, reports a coefficient of 0.2. These results point up the magnitude of variation in statistical measurement depending on method and periods analyzed.

Consumption of coffee rose sharply during the war years. Probably, the rise cannot be explained by economic forces or by any simple trend

[1] Italic numbers in parentheses refer to literature cited, page 71.

[2] The standard error terms for each coefficient are shown in parenthesis. Intercorrelation between price (p) and income (I) was very low—$r^2_{23}=0.026$.

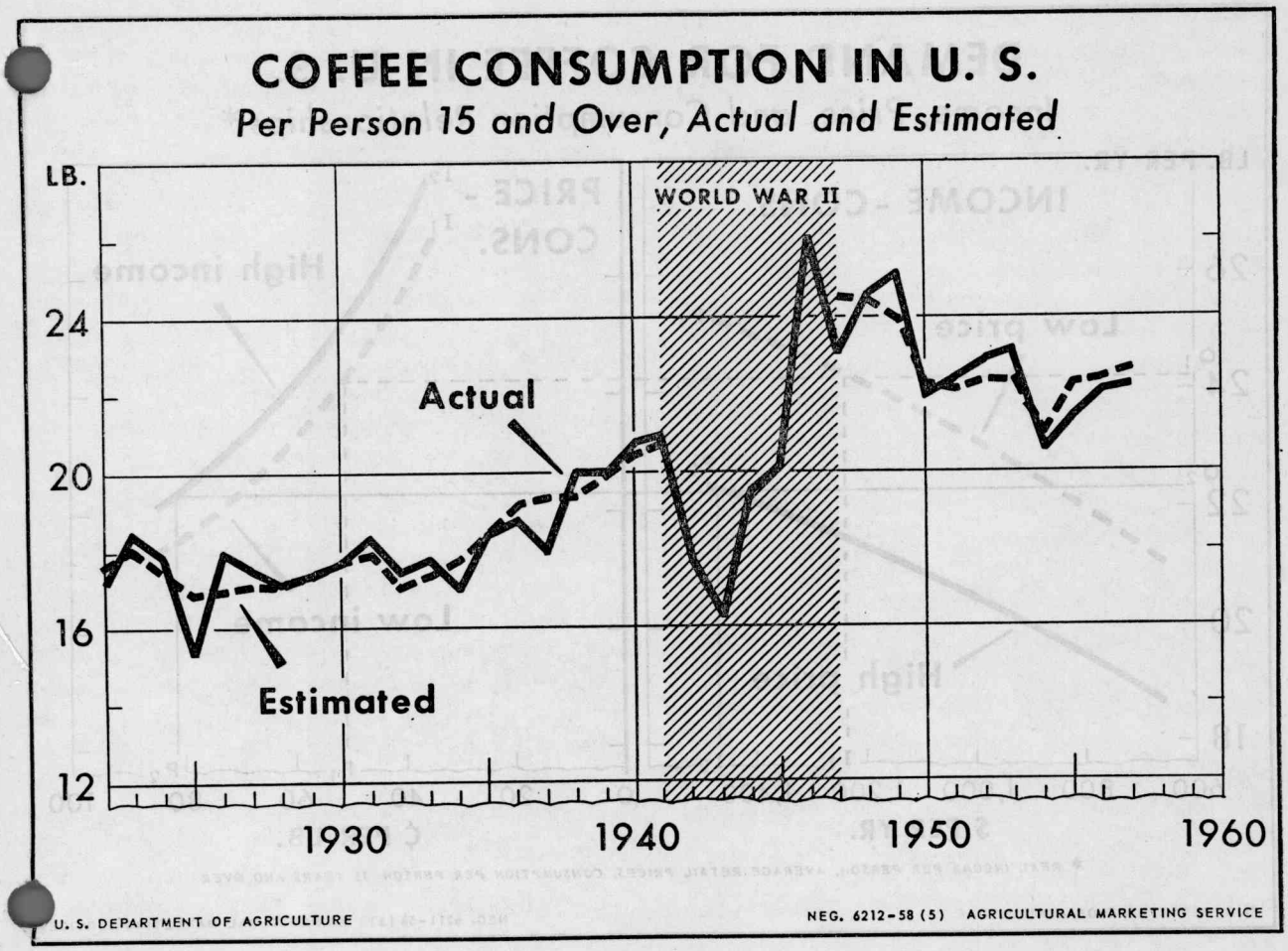

FIGURE 1.

analysis. Big supplies, restricted shipping facilities, relatively low prices, and wartime strains apparently contributed to that sharp rise in consumption. When the prewar and postwar years are analyzed together, a higher income effect is indicated than for either period separately. This situation apparently exists for all foods combined as well as for a number of other commodities.

If the price elasticity of demand is around -0.25 to -0.3, the lower estimate of income elasticity of demand is probably more reasonable. Consumer behavior making for a low price elasticity of demand probably would result in a similar income effect—of the opposite sign—particularly if there are no highly competitive commodities. There is some logic as well as empirical evidence to suggest that the sum of elasticities for all monetary variables should approximate zero—price and income elasticity of demand would be about the same size but of different sign. However, the extent to which consumption is positively related to prices of highly competitive products, price elasticity of demand should exceed income elasticity of demand (*5, p. 292 ff., and 6, pp. 114–115, 143, and 144*).

As a check on the unsatisfactory results for the postwar period, data on coffee consumption relative to income were available from income-expenditure surveys for 1948 and 1955 (*7, pp. 85 and 90 and 8, pp. 11, 17, and 161*). These studies report coffee consumption by income levels at a particular point in time. Both show a flexibility of consumption relative to income a little above 0.2 compared with the 0.23 based on the prewar analysis (equation 1) and this elasticity is about half as large as reported in the FAO study. These data, when plotted, emphasize also the much lower level of per capita use in 1955

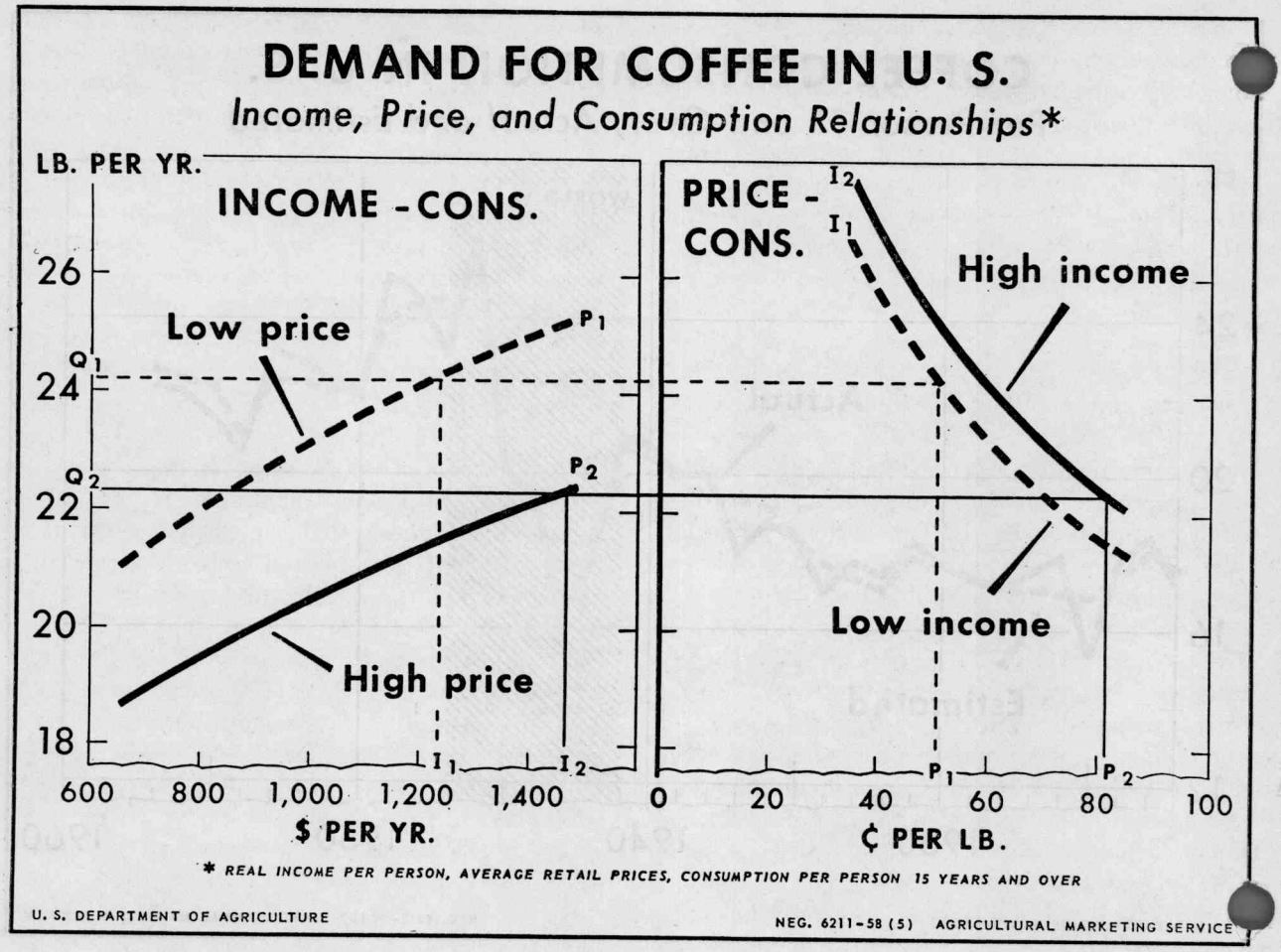

FIGURE 2.

than in 1948, chiefly because of the higher prices for coffee and, possibly, some technological developments between the two periods.

On the basis of results of these consumption-income studies it appears that price and income elasticities of demand based on the prewar analyses were the best indication of how consumers modify their consumption in response to changes in price and income. But in order to use these relationships in the postwar period, it was necessary to adjust arbitrarily the constant term in the estimating equation to reflect the higher postwar level of coffee consumption.[3] This adjustment does not change the price and income elasticities assumed for the period. It does recognize that no simple analytical framework explains the large increase in consumption during the World War II period.

Per Capita Use Trending Downward

Consumption per capita estimated on the basis of equation (1) follows closely actual consumption for the prewar and postwar years. Despite rising consumer incomes in the postwar years, the sharp rise in relative prices for coffee contributed to the decline in per capita consumption of coffee beans during that period.

Average retail prices of coffee for 1956 and 1957, adjusted for changes in the general price level, were about 56 percent above the 1947–49 average. Possibly a fourth of all coffee consumed in the United States is sold through restaurants, hotels, and other institutions, and the retail price of a cup of coffee has generally doubled in these outlets. In addition, few places now give a second and third cup of coffee with a meal.

[3] The constant term in equation (1) was raised from 1.034 to 1.126 in order to make estimated equal actual consumption in the 1947–49 period when price and income levels were taken into consideration.

Rising prices for coffee in recent years have encouraged the development of substitute beverages and coffee extenders. Less coffee is wasted at the higher prices and institutional users are reportedly making more cups of coffee per pound of beans—possibly as many as a third more. Although lower relative prices are likely to stimulate increased consumption, some of these inroads in the demand for coffee probably will be permanent.

Consumption, Price, and Income

Relationships among consumption, prices, and income are illustrated for the immediate postwar years and for 1956 on the basis of the demand analysis, in order to point out shifts among these relationships between the two periods. The left grid of figure 2 shows the relationship between per capita real income and consumption at the 1956 level of coffee prices (P_2) and the 1947–49 average (P_1). For any given income level, consumption is greater at a low than at a higher price for coffee. Also, at any given price level, higher incomes contribute to increased consumption of coffee. In this grid, the higher 1956 price of coffee is also associated with the high real consumer income shown by the solid line.

The right grid of figure 2 shows the relationship of retail price per pound to consumption for two levels of demand. The 1956 demand level (I_2) corresponds to the low consumption (Q_2) and the higher price level (P_2). The 1947–49 income level (I_1) corresponds to the higher consumption level (Q_1) and the lower price level (P_1). If consumption were held at the 1947–49 level of 24 pounds, the 1956 demand conditions, according to these relationships would suggest substantially lower relative prices for coffee.

Efficiency and More Cups Per Pound

Some analysts suggest that much of the decline in per capita use of beans in recent years reflects increased use of instant or soluble coffee. The greater efficiency in instant coffee is difficult to appraise. Estimates by coffee experts vary all the way from little or no increase to a gain of possibly 40 percent in cups of coffee per pound of green coffee bean.

A recent official Government report indicates that instant coffee represents about 17 percent of total consumption in this country and that such soluble products provide about 15 percent more liquid coffee than can be brewed from the same quantity of regular coffee (*9, January 1958, p. 20*). However, the advantage on a cost-per-cup basis probably would be less than 15 percent (*11, NFS–81, p. 31*).

If an efficiency of 15 percent for 17 percent of the coffee is assumed, this technological factor would represent only around 2½ percent fewer pounds of beans used because of the greater efficiency of soluble coffee. With the consumption of coffee beans for 1957 this would amount to around 22½ pounds per adult rather than the 22 pounds reported. But the convenience of instant coffee may have resulted in greater consumption in some households, particularly between meals.

The Federal Trade Commission report (*3, pp. 44 and 45*) suggests that the efficiency of extraction in instant over roasted coffee is larger than 15 percent. Although the quantity of water used by the consumer is not known, this report indicates an advantage in instant over roasted coffee of possibly 40 percent. If the efficiency factor was this large in 1957, consumption of beans was around 1 to 2 pounds per person smaller than it would have been without the instant coffee. Moreover, such high efficiency may result in an increasing share of coffee consumed in instant form in coming years.

Stretching the use of coffee to make more cups per pound also has a significant influence on the use of coffee beans. If institutional users retail about a fourth of the coffee sold and if they now get about a third more cups per pound of coffee than formerly, this addition of water would substantially reduce total bean requirements for a given number of cups of coffee. An adjustment for increased use of water together with assumed greater efficiency of instant coffee, on 1957 consumption, may represent 2 or 3 pounds of beans per adult.

These two adjustments would largely account for the difference between 22 pounds per person in 1957 and around 25 pounds in 1949. At best, these calculations are only rough approximations. Not all public eating places may be brewing more cups of coffee per pound of beans, whereas probably many household users are getting more cups per pound and are less wasteful than formerly.

Some of the increase in number of cups of coffee per pound of beans probably represents technological developments in brewing and possibly a

more widespread use of extenders. Although the use of less coffee bean per cup of coffee may be largely a matter of price, cheaper coffee probably would not bring a complete reversal to earlier brewing techniques and wasteful habits.

Coffee Prices and Some Forces Influencing Them

Coffee prices depend to a considerable extent on general economic conditions and consumer incomes in the United States as well as on world supply conditions and many other forces that cannot be measured. Most producing countries exercise controls over the production and marketing of coffee. The consumption and price are influenced in many European countries by import restrictions, colonial preference, tariffs, and taxes. Cyclical variations in production and inadequate statistical reporting on production and stocks contribute to considerable variation in price, and complicate the job of analyzing price movements as well.

Many of these institutional factors are major influences in price-making in the current coffee situation, particularly as they modify available market supplies. Another analytical complication arises from the need to treat the interdependence of world supply and demand conditions. We cannot isolate the influence of different markets with simple analytical frameworks.

For the major United States market, a simple economic framework will require successive approximations among relationships to get reasonably consistent results. For example, an appraisal of domestic requirements for coffee requires an assumption for retail prices. In the price equation, the domestic supply must be prejudged as a first approximation when estimating wholesale prices.

Despite these limitations, some simple single equation relationships were found to be useful in analyzing the major forces that have influenced wholesale coffee prices at New York during the last quarter-century. An attempt was made to include both the United States and European markets for coffee, as well as the world supply of coffee. But most reasonable results were obtained from a relationship expressing the wholesale price of coffee at New York as a function of (1) United States domestic demand conditions, (2) United States supplies of coffee facing the consumer, and (3) a composite variable designed to show wor[illegible] supplies relative to world exports.

Coffee Prices: An Appraisal

Wholesale prices of Santos No. 4 coffee at New York appeared to be one of the most representative price series. This series, which is represented by (P_w), was adjusted for change in the price level by deflating by the consumer price index. As in the demand analyses, per capita consumer disposable income, adjusted for change in the price level, was used as the indicator of domestic demand conditions (Y). Domestic supplies (S) facing the United States consumer consist of the sum of United States carryover stocks and imports per person 15 years and over (table 1).

The world supply variable (W) is an involved composite of both supply and demand influences. Carryover stocks supposedly represent visible world stocks in both importing and exporting countries. Some of this statistical information is not a matter of record—such estimates are rough approximations. Stocks and world production estimates are those reported for marketing years by the United States Foreign Agricultural Service (*10*). Total supplies (carryover plu[illegible] production) were divided by world exports to indicate the relative size of supplies. This variable was lagged by a half-year. Thus, in appraising calendar year 1958, estimated production and exports for 1957–58, which are available early in the calendar year, can be used in an appraisal of price prospects for the year.

These analyses were expressed in logarithms to show proportionate changes among variables. The prewar and postwar years were analyzed separately because of indicated substantial shifts in relationships among variables. Results of the 1922–41 period analysis follow:

$$\log P_w = 2.078 + \underset{(0.504)}{0.713} \log Y - \underset{(0.620)}{2.070} \log S - \underset{(0.215)}{0.563} \log W \qquad (2)$$

$$R_{1.234} = 0.82$$

There was very little intercorrelation among the independent variables. However, the error terms were fairly large and the correlation is

TABLE 1.—*Coffee prices, consumption, world supply, and related data, 1922–57*

Years	Per capita consumption	Retail prices per pound	Per capita income	Consumer price index	Wholesale price per pound	U. S. supply per person	World supply	World production	World net exports	Population 15 and over
	Pounds [1]	*Cents* [2]	*Dollars* [3]	*1947–49=100* [4]	*Cents* [5]	*Pounds* [6]	*Million bags* [7]	*Million bags* [8]	*Million bags* [9]	*Millions* [10]
1922	17. 2	36. 1	756	71. 6	14. 2	19. 1	8. 6	22. 7	19. 6	75. 2
1923	18. 4	36. 9	845	72. 9	14. 5	19. 8	8. 6	18. 2	18. 1	76. 7
1924	17. 8	42. 6	834	73. 1	21. 3	19. 0	5. 3	30. 2	22. 3	78. 5
1925	15. 3	50. 4	848	75. 0	24. 5	17. 0	9. 6	21. 0	20. 0	79. 9
1926	17. 9	50. 2	861	75. 6	22. 3	19. 7	6. 8	25. 8	21. 2	81. 3
1927	17. 5	47. 4	869	74. 2	18. 7	18. 8	7. 3	26. 0	21. 4	82. 8
1928	17. 1	48. 2	891	73. 3	23. 2	18. 4	7. 7	38. 6	23. 7	84. 2
1929	17. 3	47. 9	930	73. 3	22. 1	18. 5	18. 2	22. 6	22. 0	85. 6
1930	17. 7	39. 5	846	71. 4	13. 2	19. 3	14. 3	45. 2	23. 4	87. 1
1931	18. 3	32. 8	792	65. 0	8. 7	21. 1	31. 4	28. 9	26. 2	88. 2
1932	17. 4	29. 4	668	58. 4	10. 7	19. 4	28. 7	40. 1	23. 6	89. 3
1933	17. 7	26. 4	658	55. 3	9. 3	19. 4	31. 7	27. 9	21. 4	90. 4
1934	17. 0	26. 9	719	57. 2	11. 2	18. 2	23. 1	45. 5	24. 8	91. 6
1935	18. 4	25. 7	782	58. 7	8. 9	19. 9	27. 1	29. 8	21. 1	92. 9
1936	18. 7	24. 3	872	59. 3	9. 5	19. 9	24. 1	37. 9	25. 6	94. 1
1937	18. 0	25. 5	897	61. 4	11. 1	18. 9	28. 9	42. 7	24. 0	95. 3
1938	20. 0	23. 2	839	60. 3	7. 8	21. 4	30. 4	38. 4	24. 7	96. 5
1939	20. 0	22. 4	906	59. 4	7. 5	21. 8	23. 3	37. 5	26. 6	97. 8
1940	20. 7	21. 2	962	59. 9	7. 2	22. 3	23. 0	35. 2	25. 6	99. 2
1941	20. 9	23. 6	1, 108	62. 9	11. 4	27. 0	23. 5	26. 2	22. 5	100. 5
1942	17. 7	28. 3	1, 250	69. 7	13. 4	22. 6	17. 4	27. 0	18. 6	100. 7
1943	16. 2	30. 0	1, 320	74. 0	13. 4	23. 2	14. 7	30. 8	17. 4	103. 0
1944	19. 5	30. 0	1, 410	75. 2	13. 4	29. 4	18. 7	31. 6	24. 2	104. 3
1945	20. 1	30. 5	1, 398	76. 9	13. 4	31. 4	17. 9	32. 8	25. 4	105. 4
1946	26. 1	34. 4	1, 350	83. 4	18. 7	31. 3	17. 5	33. 7	27. 9	106. 3
1947	23. 1	46. 9	1, 228	95. 5	26. 4	27. 6	16. 4	35. 3	27. 2	107. 5
1948	24. 6	51. 4	1, 245	102. 8	26. 8	29. 6	17. 0	34. 4	30. 8	108. 6
1949	25. 1	55. 4	1, 239	101. 8	31. 8	30. 9	13. 3	39. 1	32. 3	109. 8
1950	21. 9	79. 4	1, 322	102. 8	50. 9	26. 7	10. 8	37. 7	31. 2	110. 9
1951	22. 3	86. 8	1, 319	111. 0	54. 3	27. 9	9. 3	38. 1	31. 6	112. 1
1952	22. 8	86. 8	1, 332	113. 5	54. 1	27. 5	7. 7	39. 2	32. 2	113. 2
1953	23. 1	89. 2	1, 371	114. 4	58. 5	28. 2	6. 4	41. 5	32. 9	114. 2
1954	20. 5	110. 8	1, 365	114. 8	78. 3	23. 8	6. 7	44. 0	33. 5	115. 3
1955	21. 3	93. 0	1, 428	114. 5	57. 0	24. 8	9. 1	42. 2	29. 2	116. 5
1956	22. 0	95. 1	1, 470	116. 2	58. 3	26. 8	13. 8	50. 4	38. 9	117. 6
1957	22. 0	93. 2	1, 457	120. 2	57. 3	26. 8	16. 9	45. 4	36. 5	119. 1
1958							17. 7	51. 9	37. 0	120. 6

[1] Consumption of coffee per person, 15 years and over. Computed from data in *Supplement for 1956 to Consumption of Food in the United States.* 1909–52, U. S. Department of Agriculture Handbook 62, 1957, p. 113.

[2] Average retail price of coffee per pound in leading cities of the United States, 1922–55. The years 1956 and 1957 are an average of the reported retail price of coffee in bags and in vacuum packs. Bureau of Labor Statistics.

[3] Per capita disposable income deflated by the consumer price index (1947–49=100). Department of Commerce, 1929 to 1957 and for early years, *Supplement for 1956 to Consumption of Food in the United States,* 1909–52, U. S. Department of Agriculture Handbook 62, 1957, p. 55.

[4] Consumer price index (1947–49=100). Department of Commerce.

[5] Average wholesale price of coffee per pound, Santos No. 4, N. Y., Bureau of Labor Statistics.

[6] U. S. supply (beginning stock plus imports) per person 15 years and over. Computed from data in *Supplement for 1956 to Consumption of Food in the United States,* 1909–52, U. S. Department of Agriculture Handbook 62, 1957, p. 113.

[7] Stocks supposedly represent reported world stocks in importing and exporting countries. Years 1921–45 based on data from New York Coffee and Sugar Exchange. Recent years from Foreign Agricultural Service.

[8] World production from *Foreign Agriculture Circular* FCOF–8–57, Dec. 27, 1957. Years back of 1925–26 based on net exports and estimated distribution of coffee in producing countries.

[9] Net exports consist of Brazilian exports and production outside Brazil based largely on reported exports. Data from Foreign Agricultural Service and New York Coffee and Sugar Exchange. See also *Foreign Agriculture Circular* FCOF–8–57, Dec. 27, 1957.

[10] Population 15 years and over. U. S. Bureau of the Census, *Current Population Reports* Series P–25, No. 170 for 1955–57 and Nos. 98, 114, and 146 for 1922 to 1954.

relatively low. Possibly a lagged price variable (Pwt–1) would have improved the correlation and might have resulted in a better estimating equation.

The same relationships for the postwar years, 1947 to 1957, though based on only a few years, gave logical results:

$$\log P_w = 0.561 + \underset{(0.514)}{1.513} \log Y - \underset{(0.440)}{2.257} \log S - \underset{(0.347)}{1.989} \log W \qquad (3)$$

$$R_{1.234} = 0.98$$

The results of equation (3) indicate that a 10-percent rise in real consumer income in the United States were usually associated in the postwar period with an increase of about 15 percent in the wholesale prices of coffee (P_w). But a 10-percent increase in United States coffee supplies per adult usually accompanied a reduction of around 22 percent in wholesale prices of coffee. An increase of 10 percent in the relative world supply situation (W) tended to reduce United States wholesale prices for coffee by about 20 percent.

Although these analyses are greatly oversimplified, they account closely for prewar and postwar variation in wholesale coffee prices on the New York market (fig. 3). In some instances, the direction of change was missed, particularly in 1941, a year in which speculative stock accumulations strengthened prices, and again in the 1950–52 Korean war period. The upsurge in prices in 1954 is fairly well explained and the recent weakening in coffee prices is suggested by the relationship.

The Coffee Situation: 1958

Coffee prices in the United States at both retail and wholesale have declined substantially during the past year. Average retail prices of bagged coffee in the first quarter of 1958 averaged 13½ percent below a year earlier and prices for vacuum packed coffee were down about 12 percent. April retail prices were down around 11 percent from 1957. Wholesale prices also are down; in May Santos No. 4 averaged around 15 percent below a year earlier and prices for Colombian Manizales averaged nearly a fifth lower. The characteristic year-to-year variation in the supply, along with a fairly low price elasticity of demand, put coffee prices under considerable downward pressure when supplies increase as they have in the last year.

Prospective Demand-Supply Conditions

Let us examine more closely the economic forces in the situation in the analytical framework so far presented. Current and prospective trends in economic activity point to some decline in general demand particularly in the United States market. However, real consumer incomes are not expected to average as much as 5 percent below those of 1957.

Carry-in stocks in the United States at the beginning of 1958 totaled 2.96 million bags, 5 percent larger than a year earlier. Apparently, roastings of coffee so far this year are running about a tenth ahead of a year earlier, according to trade reports. But imports in the early months of 1958 were more than a million bags below the first 2 months of 1957. It appears that United States consumption is being well maintained at the lower price levels this year by drawing on stocks. Even with some reduction in United States carryover stocks, consumption requirements at current prices probably will necessitate some increase in imports. Reasonably consistent relationships among supply, consumption, and price variables in the demand and price equations suggest United States coffee supplies per adult a level a little above 1957.

Recent reports on world production put the 1957–58 crop at 51.9 million bags, some 6½ million larger than output for the 1956–57 marketing year. Trends in world exports of coffee so far in the 1957–58 marketing year indicate that net exports may change little from the 36½ million bags in 1956–57—possibly up slightly. With a production of 51.9 million bags and carry-in stocks of 17.7 million, world supplies for 1957–58 total more than 7 million bags above a year earlier, and the ratio of supplies to exports increases by around a tenth. Indicated supply and disposition also suggest a substantial increase in carryover stocks during the 1957–58 marketing year.

Lower Wholesale Prices Indicated

These demand and supply prospects for coffee in the framework of equation (3) point to a substantial decline in wholesale coffee prices—possibly upward of a fourth on the average from 1957 to 1958 for Santos No. 4. In May, prices of

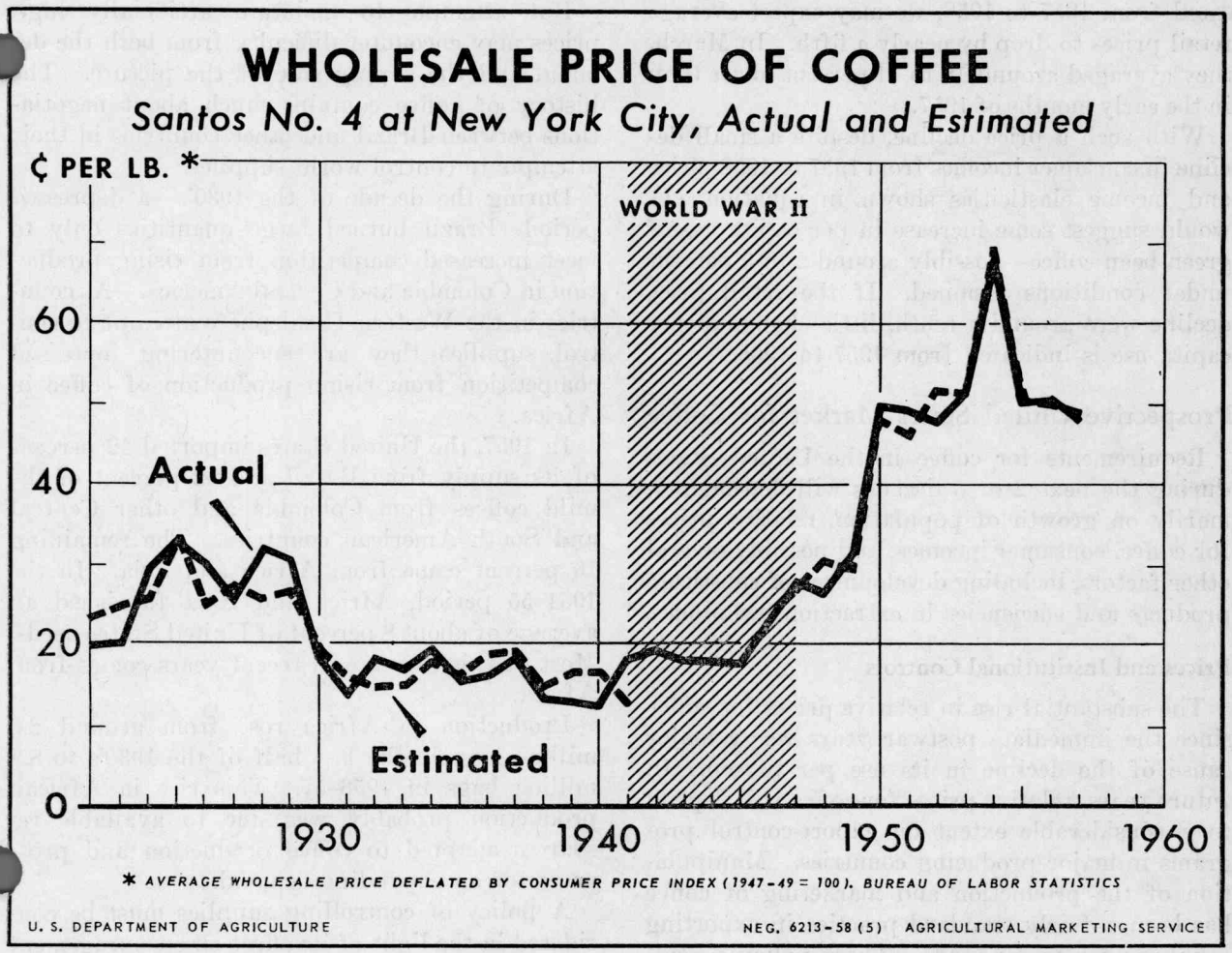

FIGURE 3.

Santos No. 4 averaged around 15 percent lower and Colombian Manizales nearly a fifth lower than in May 1957. In the same analytical framework and the basic assumptions for 1958, an increase of around 4 million bags in world exports or an effective insulation from the market of possibly 7 to 10 million bags, would suggest wholesale prices of Santos No. 4 at New York around the levels of April and early May 1958. These magnitudes are suggestive, not precise.

Many assumptions had to be made about U. S. demand and supply conditions as well as probable world exports. Estimates of supply and of the quantity of withholding of coffee by exporting countries are still tentative. There is some indication that world production may be higher than current estimates. Moreover, if the 1958–59 crop is again large, this and the expected substantial increase in carryover stocks during 1957–58 could put considerable pressure on prices later in 1958. Programs designed to maintain coffee prices could be of major importance in influencing future price trends.

Larger Domestic Use Indicated

Declining wholesale prices for coffee have been accompanied by a drop in retail prices. In general, variations in wholesale and retail prices follow each other with very little lag.[4] If wholesale prices are down by almost a fourth as indi-

[4] Retail prices of coffee in the United States expressed as a function of the wholesale price of Santos No. 4 at New York showed their movements to be highly correlated—r_{12}=0.99. At 1957 price levels, the relationship indicated that variations in retail prices amounted to about 0.8 of the variation in wholesale prices.

cated from 1957 to 1958, we may expect average retail prices to drop by nearly a fifth. In March, they averaged around 12 to 14 percent lower than in the early months of 1957.

With such a price decline, despite a small decline in consumer incomes from 1957 to 1958, price and income elasticities shown in equation (1) would suggest some increase in per capita use of green bean coffee—possibly around 2 to 5 percent under conditions assumed. If the retail price decline were around a tenth, little change in per capita use is indicated from 1957 to 1958.

Prospective United States Market for Coffee

Requirements for coffee in the United States during the next 2 or 3 decades will depend primarily on growth of population, relative prices for coffee, consumer incomes, and possibly several other factors, including development of substitute products and efficiencies in extraction techniques.

Prices and Institutional Controls

The substantial rise in relative prices for coffee since the immediate postwar years was a major cause of the decline in its use per person. In future years, relative prices for coffee will depend to a considerable extent on export-control programs in major producing countries. Manipulation of the production and marketing of coffee has been a fairly standard practice in exporting countries for many years. These policy considerations spring primarily from a knowledge of demand and supply characteristics for the product.

As price elasticity of demand is relatively inelastic—small variations in quantity result in big price changes—smaller United States imports, under given demand conditions, result in greater returns to the exporter. When United States imports began to ease down from levels in the immediate postwar years, expanding demand brought a rapid rise in the value of imports. The sharply lower imports in 1954 were more valuable than the much larger imports in 1955 and 1956.

Coffee output, like the output of many fruit crops, varies from year to year and has a longer periodic cycle, which stems largely from economic considerations. Because of these variations some kind of stabilization program may be helpful in ironing out wide price fluctuations (*3, pp. 20–21, and 4, pp. 434–437*).

But attempts to maintain artificially high prices may encounter difficulty from both the demand and the supply side of the picture. The history of coffee contains much about negotiations between Brazil and other countries in their attempts to control world supplies.

During the decade of the 1930's—a depressed period—Brazil burned large quantities only to meet increased competition from rising production in Colombia and Central America. As countries in the Western Hemisphere attempt to control supplies they are encountering increased competition from rising production of coffee in Africa.

In 1957, the United States imported 42 percent of its supply from Brazil and 42 percent of the mild coffees from Colombia and other Central and South American countries. The remaining 16 percent came from Africa and Asia. In the 1951–55 period, Africa and Asia furnished an average of about 8 percent of United States needs. Most of this increase in recent years comes from Africa.

Production in Africa rose from around 2.6 million bags in the last half of the 1930's to 8.8 million bags in 1956–57. This rise in African production probably was due to available resources adapted to coffee production and prospects for an expanding demand.

A policy of controlling supplies must be considered in the light of its effect on encouragement of competing production and development of competing products in major importing countries. A parallel situation is that of cotton. Many cotton producers have come to the realization that price-support policies have tended to price that commodity out of the export markets as well as out of many domestic markets for fibers.

Probable Expansion in the United States Market

In appraising prospective expansion in the United States market for coffee, let us assume, for the sake of simplicity, one relative price at the average 1957 level and another at the lower 1947–49 average level. Real consumer incomes per person are assumed to rise by about 16 percent from 1957 to 1965 and by approximately 40 percent by 1975.

In the framework of equation (1), per capita use of coffee beans (per person 15 years and

older) would increase around 3 to 4 percent from 1957 to 1965 under the higher price assumption. An increase of possibly 15 percent is indicated under 1947–49 relative prices, which are more than a third below 1957.

If it is assumed also that the use of instant coffee rises to a fourth of total use from the current 15 to 20 percent, and yields about 20 percent more cups of coffee per pound of beans, a very small rise in per capita use is indicated between now and 1965 under the higher price assumption. The projected rise under the lower price assumption would also be scaled down from around 15 percent to possibly 12 percent above 1957. This range in per capita use and population growth results in domestic use rising by 15 to 25 percent from 1957 to 1965.

Indicated per capita use for 1975 rises around 8 percent from 1957 under the lower price assumption, and as much as a fifth if the lower price level is assumed. Assuming that the use of instant coffee rises to around a fourth of total utilization, the indicated rise in per capita use would be scaled down to gains of around 6 percent and about 18 percent from 1957. Projected total domestic use would rise by 40 to 55 percent from 1957 to 1975.

If the advantage of instant over roasted coffee is as much as 40 percent, instant coffee would probably make up an increasing share of total coffee consumed. Under the higher price level and conditions projected for 1965 and 1975, per capita use of green bean coffee probably would not increase, and may decline some, in the next decade. Projected increases under the lower price assumption would also be scaled down to about half those indicated above for the smaller efficiency assumption. Total domestic use, assuming the higher (1957) price level, would rise only 5 to 10 percent from 1957 to 1965 and possibly a third by 1975.

The projected changes above are very rough approximations based on fairly specific assumptions regarding relative prices, consumer incomes, and consumer behavior. Some attempt is made to handle explicitly the possible effect of instant coffee, but the influence of other technological developments, and the development of competitive products and coffee extenders, could also modify projected United States requirements.

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