

EMIGRATION AND CAPITAL FORMATION : THE CASE OF GREECE*

I. *Introduction*

Recent trends in Greek emigration (1965) have raised many public-policy issues and debates but no empirical work.¹ Charles P. Kindleberger has argued that "the Greek fears, though difficult to judge from a distance, have the appearance of being anticipatory so long as the economy grows at more than five percent a year and the population is still growing positively."² Both criteria are misleading. The first implies that the actual rate of growth is equal to the potential rate of growth; the second fails to bring forward the fact that emigration exceeds the "increase" in population. On a more general level, Kindleberger argues that the emigrant's product "is not lost to the state because it was never contemplated that it would accrue to the state."³ The same line of reasoning is followed by H. G. Grubel and A. D. Scott.⁴

These contributions neglect, among other things, the importance of private capital accumulation for a developing economy. Kindleberger is right about the contribution of traditional emigrant remittances to non-human wealth accumulation, but such an emphasis on remittances assumes that there is no social cost of emigration. Abstracting from dynamic aspects and

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1. Between January and May 1965, a series of articles and letters were published in the Greek monthly, *Epoches*, that indicate the extent of division and confusion about the economic and political aspects of modern Greek emigration.

2. Charles P. Kindleberger, "Emigration and Economic Growth," Banca Nazionale del Lavoro *Quarterly Review*, No. 74 (September 1965), p. 247.

3. *Ibid.*, p. 246.

4. See "The International Flow of Human Capital," *A.E.R. Papers and Proceedings*, May 1966, pp. 270f; also "The Immigration of Scientists and Engineers to the United States, 1949 - 1961", *Journal of Political Economy*, LXXIV (August 1966).

capital-labor ratio, it can be shown, however, that the cost, expressed in terms of lost savings, is not only large, but it also exceeds by far the gain due to emigrant remittances. We may define, then, social cost of emigration as the present value of the emigrant's stream of net contribution to the society's wealth, if the individual chooses to stay home rather than emigrate.

II. The Statistical Evidence

The following assumptions are made: (1) there is full employment in the country of emigration; (2) the annual wage earnings in manufacturing reflect the workers' marginal and average productivity; (3) the society's marginal propensity to consume remains constant and equal to the average; (4) no changes in the age composition of Greeks take place; and (5) there are no changes in productivity per worker.

The present value of the stream of net income for any individual at age (j) is:⁵

$$V(C)_j = \sum_{j=1}^n \left[(W_j - C_j) P_j^n \frac{1}{(1+r)^{n-j}} \right] \quad \dots (1)$$

Where:

W_j = the wage income (=productivity) of a person at age j.

C_j = the individual's consumption at age j.

P_j^n = the probability that an individual who is alive at age j will also be alive at age n.

r = the discount rate (s).

Several values were employed in estimating $V(C)_j$. The maximum age (n) was set at 75. Two, rather, than one, W_j were used. W_j , for $j=1, \dots, 14$, was zero. Infants do not have income. Their capital formation is negative. Then $W_{11} = \$700$ for $j=15, \dots, 75$ and $W_{21} = \$760$ for $j=15, \dots, 75$.⁶ $W_j - C_j$, or the

5. In this section I have followed the techniques employed by Burton A. Weisbrod in "The Valuation of Human Capital," *Journal of Political Economy*, LXIX (1961), pp. 425-436.

6. A survey of the National Statistical Service of Greece found that per capita remuneration in manufacturing in 1961 was 22,800 drachmae, or \$ 760. The wage earnings of \$ 700 represent the low — but not the lowest — remuneration for the same year. See its 1961 *Annual Industrial Survey and Survey of Gross Investment* (Publication L), Athens, 1963, Table II, p. 23.

Figures published by the National Bank of Greece show, however, higher rates for both weekly wages and monthly salaries prevailing in industry. Moreover, the same publication shows an increase of 8.8 percent in monthly salaries and an increase of 4.6 percent in weekly

per capita savings, was taken to be \$76.00 and \$140.00 for all ages, that is, for $j=15, \dots, 75$. The former amount is equal to the 1961 per capita investment at 1954 prices, and the latter is an approximation of current per capita capital formation. Four (4), seven (7), and ten (10) percent discount rates were used.

The assumptions of constant consumption throughout the individual's lifetime (from $j=1, \dots, 75$) and constant annual wage earnings from the age of 15 to the age of 75 are dictated more by the lack of data than by any logical considerations. Consumption in the pre-working age should be lower than consumption in the early stages of "bachelorhood," when the individual works but has no family unit. As new families are formed, individual consumption should fall and then rise again after the children reach a certain age.

The results of the estimates are averaged out according to the age groups and presented in Table I. For example, for ages 15-19, the present values of individual ages were added and the total divided by 5, the number of ages in the group.⁷

The first thing we observe is that the highest present value, regardless of the value of the discount rate and consumption, comes at the age of 15 and keeps declining. This is due to the assumption of identical consumption throughout the individual's life and the increase in W from zero at age 14 to a positive but constant amount at the later ages. The highest present values should occur in the age groups 25-29 and 30-35.

Since the bulk of emigrants is between 15 and 35 years old, we can exclude the negative or positive values of those below 15 years of age. Equation (1) gives, of course, the present value of an individual at any age between 1 and 75 years. In estimating the cost to the society due to emigration, we must, however, compute the total cost for all individuals and all ages. Thus, in 1961-1962, 39,394 emigrants were between 25-29 years old.⁸ This was multiplied

wages between November 1961 and August 1963, while the hours worked per week by the latter fell from 44 to 42. See *Greece Today*, June 1964, p. 46.

Since, for our purposes, we are more interested in the difference between wage earnings and consumption, it does not matter which values we use as long as we approximate the per capita net capital formation. The rate of increase in wage earnings shows, however, the shortcomings of the static assumptions.

7. The total cost for the years 1961-1962 under $(W - C) = \$140$ is \$363 million in the case of $r = 4\%$, \$247 million in the case of $r = 7\%$, and \$185 million in the case of $r = 10\%$. The other two estimates of $(W - C) = \$76$, not shown in Table 2, have as follows: \$197 million in the case of $r = 4\%$ and \$101 million in the case of $r = 10\%$.

8. We should remember that the assumption of uniform C and W underestimates the value of certain ages and overestimates others. Since the bulk of the emigrants falls within the age groups that are underestimated, total cost is rather conservative. The ranges of the dif-

TABLE I
PRESENT VALUES OF FUTURE SAVINGS OF GREEKS BY AGES
AT DISCOUNT RATES OF 4, 7, AND 10 PERCENT
(IN U.S. DOLLARS)

Ages (In Years)	(W _j - C _j) = \$ 140			(W _j - C _j) = \$ 76		
	4%	7%	10%	4%	7%	10%
15 - 19	2987	1946	1433	1621	1056	778
20 - 24	2890	1916	1421	1569	1040	771
25 - 29	2775	1896	1405	1506	1020	762
30 - 34	2639	1828	1383	1432	993	751
35 - 39	2477	1763	1353	1345	957	734
40 - 44	2291	1677	1309	1241	911	711
45 - 49	2059	1564	1248	1118	849	677
50 - 54	1788	1411	1155	971	767	627
55 - 59	1474	1212	1023	800	658	555
60 - 64	1119	963	843	608	523	457
65 - 69	731	662	604	397	359	328
70 - 74	325	311	298	176	169	162

Source: Computed according to equation (1).

by the average present value of social cost for that age group in order to get the total cost for that group. It would be preferable to estimate by age rather than age group, but we lack a finer breakdown of emigration. The values for all age groups are given in Table 2.

In spite of the net productivity, the very early ages give negative present values.⁹ This could be the result of (a) high infant mortality rates, (b) high

ference between W and C, however, should give a good approximation of the true magnitude of the expected values.

9. Stephen Enke estimated that the present value of consumption in India exceeds the present value of production. "In determining," says he, "the present (discounted) value to the economy of a newly born person, the contribution to product, because it occurs fifteen or more years later, is of small consequence, and arguments regarding the exact size of the marginal product are rather academic." See "The Gains to India from Population Control: discount rates, and (c) identical consumption for the whole lifetime. In our

case, the negative values are the results of (b) and (c) rather than (a).

For the years 1961 and 1962, 93.75 percent of the emigrants were over the age of 14. If this age distribution took place in 1964 — and there is no reason to assume that it changed — 98,975 emigrants were over 14 years old in 1964. Using the weighted average cost per emigrant for the two sets of values of (W-C) and the three interest rates, the computations of Table 3 become easy.¹⁰

TABLE 2
ESTIMATED PRESENT VALUE OF SAVINGS AND TOTAL SOCIAL
COST FOR $(W_j - C_j) = \$ 76$ AND DISCOUNT RATE OF 7 PERCENT

Age	Emigrants (1961-1962)	$V(C)_j$	Total Cost
(1)	(2)	(3)	(4)=(2) × (3)
15 - 19	17,144	\$ 1,056.194	\$ 18,741,106
20 - 24	31,719	1,040.206	32,994,294
25 - 29	39,394	1,019.588	40,165,650
30 - 34	23,616	992.596	23,436,539
35 - 39	10,868	957.081	10,401,556
40 - 44	4,594	910.510	4,182,863
45 - 49	2,398	849.260	2,036,525
50 - 54	1,565	766.525	1,196,612
55 - 59	1,143	658.186	752,307
60 - 64	865	523.029	452,420
65 - 69	432	359.286	155,212
70 - 74	228	168.571	38,434
Total	133,966		\$ 134,553,538

Source: Column (1) - National Statistical Service of Greece, *Statistical Yearbook of Greece* 1963, Athens, 1964, p. 286; Column (2) - Average of the individual present values obtained from equation (1).

Some Money Measures and Incentive Schemes," *Review of Economics and Statistics*, XLII (1960), p. 177.

In the Greek case, however, neither the birth nor death rates are so high as they are in India. Moreover, in the Greek case, at least at the present, the net contribution to capital formation is high. Therefore, Enke's reasoning is not applicable to our case.

10. The first step in compiling Table 3 is to find the *per emigrant* cost in terms of discoun-

TABLE 3
TOTAL SOCIAL COSTS OF GREEK EMIGRATION, 1964
(In thousands of U.S. dollars)

r (1)	$(W_j - C_j) = \$ 140$ (2)	$(W_j - C_j) = \$ 76$ (3)
4 percent	267,898	145,452
7 percent	182,777	99,420
10 percent	136,972	74,322

Source: Computed on the basis of Tables 1 and 2.

III. Remittances

Emigration involves not only costs but also returns in the form of remittances (R). These returns are looked upon from the society's point of view rather than the individual emigrant's.

The per-emigrant monetary returns can, theoretically, be estimated in the same way that we estimated costs. What we are interested in is the present value of the stream of future emigrant remittances, (R),

$$V(R)_j = \sum_j^n \left[(R - C) \frac{1}{(1 + r)^{n-j}} \right] \quad \dots (3)$$

where r = the discount rate, which is the same with the rate employed in equation (1); R = the annual flow of emigrant remittances; and C = consumption.

The society (country of emigration) has, *ceteris paribus*, a net gain from emigration if $V(R)_j > V(C)_j$. The amount of gain (Π_j) is equal to the difference between equation (1) and (3), and could be written as:

$$\Pi_j = V(R)_j - V(C)_j \quad \dots (4)$$

ted present values for the two sets of $(W - C)$ and the three discount rates. Multiplying the average values of Table 1 by the number of emigrants in the age groups of Table 2, and dividing by the number of emigrants for 1961 and 1962 give the per - emigrant weighted average values. These values have as follows for $(W - C) = \$ 140$: \$ 2, 706.7, \$ 1,846.7, and \$ 1,383.9 for the discount rates of 4, 7, and 10 percent in that order. For $(W - C) = \$ 76$, the weighted averages are: \$ 1,383.9 for $r = 4$ percent, \$ 1,004.4 for $r = 7$ percent, and \$ 750.9 for $r = 10$ percent. Multiplying these values by 98,975, the number of emigrants who were above the age of 14 in 1964, we get the two sets of total social cost for 1964. These are given in columns 2 and 3 of Table 3.

While the difference (W-C) of equation (I) is based on the economic conditions prevailing in the country of emigration, R is affected by conditions prevailing in both the country of emigration and the country of immigration, but especially the latter. In addition to the probability that an emigrant of age j will be alive at age n and the probability that he will be employed, or

TABLE 4
GREEK EMIGRANT REMITTANCES 1919-1964
(Millions of U.S. Dollars)

YEAR	AMOUNT	YEAR	AMOUNT
1919	97	1938-45	...
1920	121	1946	28
1921	88	1947	20
1922	32	1948	11
1923	29	1949	9
1924	38	1950	14
1925	35	1951	17
1926	36	1952	18
1927	34	1953	46
1928	31	1954	47
1929	38	1955	51
1930	41	1956	61
1931	35	1957	75
1932	14	1958	77
1933	15	1959	89
1934	9	1960	90
1935	6	1961	98
1936	11	1962	117
1937	18	1963	126
		1964	116

Sources: 1919-1923. Eliot G. Mears, *Greece Today*, Stanford University Press, 1929, p. 196.
1924-1938, League of Nations, *Balances of Payments*, Geneva, 1933-1938.
1946-1964, Bank of Greece, *Monthly Statistical Bulletin*, Athens, 1948-1965.

have a stream of income in the country of immigration, through ages from j to n , we have to know the probability of his remitting part of his annual earnings to his relatives back in the country of emigration.

Estimates of the present value of the flow of remittances require data far more analytical than those available. Drawing from past experience, one can observe that the $V(C)_j$ values rise over time not only because of rising numbers of emigrants but also because of rising incomes which permit rising differences between earnings and consumption. The $V(R)_j$ values, on the other hand, do not rise in proportion to emigration. Between 1954 and 1964, emigration increased at an average rate of 17 percent, while remittances increased at an average rate of 11 percent per year.

In 1962, there were 83,000 Greek workers in Western Europe. Remittances from Western Europe in the same year amounted to \$30.7 million, or approximately \$370.00 per emigrant. If one assumes: (1) that, on the average, 90 percent of R is consumed (this is close to the Greek APC), and (2) that the emigrants send "home" the same amount for the lifetime employed in equation (1) — an assumption that overestimates R — the present value of capital formation from emigrant remittances is 26 percent of $V(C)$ for the case of $(W-C) = \$140$, and 48 percent of $V(C)$ for the case of $(W-C) = \$76$.

IV. Summary

The task of this paper is to estimate the loss in capital formation due to emigration. Dynamic aspects of emigration and repatriation have been left out. The premium placed on foreign exchange (due to Greece's chronic balance-of-payments deficits) has also been left out. Traditional literature on Greek emigration has emphasized remittances only. This paper attempts to correct this shortcoming by showing that emigration gives rise not only to revenue but also to costs for Greece. Although we lack detailed data required to estimate the present value of remittances, the available data suggest that Greece would get more capital formation if the Greeks stayed home rather than emigrate.