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Another Look at the Concept of “Overpopulation”

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Kamerschen's concept of “overpopulation” seems to have survived the initial discussion in this journal and elsewhere.¹ This apparent vitality seems to me to be attributable rather to lack of cogency in the criticisms that have been voiced than to the soundness of the original idea. Before too much effort is expended on the construction of Kamerschen's index or too much weight placed on the conclusions based on its use, it might be valuable to try to discuss some of the idea's fundamental weaknesses.

Briefly, Kamerschen suggests that “overpopulation” may be simply and fairly reliably measured by constructing an index defined as the Total Dependency Ratio (TDR), where $TDR = (100) \text{ (population aged 65 and over + population aged under 20)} / \text{(population between 20 and 65)}$. Apart from the ease with which the TDR may be constructed, the following virtues are claimed for this index: first, “overpopulation” as defined by this index is a better measure of “population ‘pressure’”² than any other single statistic available; secondly, in some ways the TDR may represent an improvement over the income-per-person measure of economic welfare, primarily because the TDR has certain “dynamic” properties supposedly absent from the income-per-person concept³ (from the terms of Kamerschen's subsequent argument, these dynamic properties appear to be the superior predictions about an economy's future growth rates that may be made on the basis of the TDR). The TDR should provide a rule-of-thumb test for the existence of what we all presumably agree to call population “pressure,” and it should also be useful as a supplement to the national-income-per-person concept, especially for making predictions about the economy's future. Some arbitrary critical level for the TDR has to be set, and countries may then be classified as “overpopulated” or “not overpopulated” on the basis of the values of their TDR. Kamerschen tentatively sets the critical value at 100, above which lies overpopulation. No implication is made about the extent of overpopulation.

Although not relying on theoretical justifications for the use of the TDR, Kamerschen does suggest some reasons for its validity.⁴ First, he

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suggests that those aged over 65 and under 20 are relatively immobile and less able to adjust to economic incentives than the population aged between 20 and 65. While this conclusion is probably justified for those aged over 65, it is certainly not justified for those aged, say, between 14 and 19: empirical studies of migration have found that that mobility is generally high for those in the latter age group.⁵ Secondly, it is asserted that

Intuitively it seems reasonable to feel that as the number of economically unproductive workers increases relative to the productive group, i.e., the dependency ratio increases, a country would have more of a population problem.⁶

The implication is that the TDR measures the ratio of “unproductive workers” to “productive workers” in a population. Of course, the TDR was not defined in terms of the age distribution of the labor force, nor in terms of the ratio of “productive workers” to “unproductive workers,” but simply in terms of the age distribution of the total population. To assume that the age distribution of the total population reflects the distribution of the population between producers and nonproducers fully evades the crucial problem of defining and measuring the productive labor force in an underdeveloped country, a problem which has preoccupied many economists in recent years. Damaging though this fault may be, it is at least defensible as a crude approximation which would have the virtue of making the measurement of “overpopulation” much easier, if less meaningful. To accept, however, without comment Bogue’s boundaries of demarcation between active and dependent population is inexcusably arbitrary and casual: Bogue’s index was for use as a *demographic* device for the *United States*, and it properly reflects the present U.S. conventions with regard to entry into and retirement from the labor force.⁷ To apply this index to the underdeveloped countries and to hope that *economic* meaning can be extracted from it is clearly to sidestep all the issues that attend the definition and measurement of overpopulation.

Of course, Kamerschen does not place too much emphasis on the theoretical justifications for the use of the TDR; instead, he emphasizes that his index has considerable support from the available empirical data, although he admits that it may be possible to find exceptions to his claims about it.⁸ Faced with this sort of methodological vacuum, it may be difficult to disprove anything to Kamerschen’s satisfaction, since his thesis has been hedged to such an extent that it may not admit of proof or disproof. A further look at the data is in order, however.

In the various cases he discusses in which the TDR test suggests that “overpopulation” does not exist, while the income per person test suggests that the nation is underdeveloped, Kamerschen is pleased to report that in almost all cases the countries in question performed well in terms of growth of real income per person in the subsequent period, and this ap-

parently supports the claims made for the superior “dynamic” qualities of the TDR. While not wishing to get involved in an example-counter-example contest, least of all when it entails the comparison of demographic and economic statistics for the underdeveloped countries, it may be useful to point out that since the TDR is a purely demographic construct, it is possible for it to rise above the critical level as a result of forces that are not clearly related to any usual concept of “overpopulation” nor to the future course of national income. A country with European-level death and birth rates, a slowly growing, stationary, or *even falling* total population could assume the demographic profile necessary to yield a $TDR > 100$, if heavy and persistent emigration occurred in the 20–65 age group of its population. There is nothing in this set of circumstances to suggest overpopulation, unless one is willing to accept emigration as a sign of this problem (Kamerschen explicitly rejects this), nor does it imply anything about the future course of the country’s income. All that is necessary is that a substantial gap exist between this country’s income and the income of some other country to which immigration is not restricted. The sufficient condition is that the country’s population should have reacted to this income gap through heavy and persistent emigration that was selective of those in the 20–65 age group.

In point of fact, the only country in which these circumstances have combined in recent history is Ireland, although migration of sufficient intensity may well have given many *regions* within the larger, richer nations the necessary population profile. (In fact, Bogue records a TDR of 99.9 for the rural farm population of the United States in 1950.⁹) Between 1956 and 1961, the population of the Republic of Ireland fell at an annual rate of 0.56 percent: the annual crude birth rate was 21.2, the crude death rate was 11.9, and the net emigration rate was 14.8 per 1,000 population.¹⁰ Almost 80 percent of this emigration was from the population aged 20–65. In 1961 the TDR for Ireland was 102.4 (or 100.8 on Kamerschen’s earlier definition), thus just passing the “overpopulation” test, despite the falling population, despite being the country with the lowest population density in Europe, and despite the \$740 level of income per person in 1964. From the “dynamic” viewpoint the TDR fares no better in this case: Ireland’s real income per person grew at an annual average rate of 4 per cent in the four years after 1961. The unusual Irish population structure is, of course, a serious problem and raises very interesting economic and social problems.¹¹ Emigration from Ireland may, in fact, be related to the very high fertility rates that are prevalent there, as well as to the low level of income in Ireland relative to the United Kingdom. But these are separate issues, involving a more detailed discussion of the concept of “overpopulation” than this debate has provided to date. The example of Ireland is adduced here merely to underline the fact that it is theoretically possible and historically verified that a country may pass Kamerschen’s test and still not be overpopulated in any of the ways in which this term is generally used.

The Irish case also serves to provide a counterexample to the “dynamic” claims of the TDR.

The upshot of this discussion is inevitably negative. The only conclusions that appear to emerge relate to research strategy: instead of looking for easy ratio tests to enable us to define “overpopulation,” the most profitable course would seem to be to construct theoretical models of the interrelations between population growth and income growth and to test these models by established econometric techniques.

1 Cf. David R. Kamerschen, “On an Operational Index of ‘Overpopulation,’ ” *Economic Development and Cultural Change*, Vol. 12, No. 1 (January 1965), pp. 169–87; and Gordon A. Marker, “Comments on an Operational Index of ‘Overpopulation,’ ” *Economic Development and Cultural Change*, Vol. 15, No. 2 (April 1967), pp. 336–38, with a “Reply” by Kamerschen, pp. 338–41, as well as the references cited in the last two items.

2 Kamerschen, “On an Operational Index . . .,” *op. cit.*, p. 171.

3 *Ibid.*

4 *Ibid.*, p. 174.

5 For a bibliography of migration studies, cf. Gunnar Olsson, *Distance and Human Interaction, A Review and Bibliography* (Philadelphia: Regional Science Research Institute, 1965).

6 Kamerschen, “On an Operational Index . . .,” *op. cit.*, p. 174.

7 According to footnote 8 of Kamerschen’s “Reply” (*op. cit.*), he is not really sure just how he wishes to define the TDR: “Presumably this group [those aged exactly 65] should be included in the numerator.” (In his calculations this group was completely omitted from both numerator and denominator!) In my definition of the TDR I have taken this footnote into account, but in the calculation of the TDR I give the figure that results from both definitions.

8 Kamerschen, “On an Operational Index . . .,” *op. cit.*, p. 186.

9 Cf. Donald J. Bogue, *The Population of the United States* (Glencoe, Ill.: Free Press, 1959), p. 102.

10 Cf. Ireland, Central Statistics Office, *Census of the Population of Ireland 1961*, Vol. 2, Table 10; and for national income data, *Statistical Abstract of Ireland*, 1965, Table 235.

11 For examples, cf. P. Kaim-Caudle, *Social Policy in the Irish Republic* (London: Routledge and Kegan Paul, 1967).