

# The Population Debate in Historical Perspective: Revisionism Revisited

by

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## 1.0 Revisionism and the Population Debate

### 1.1 Setting

Debates surrounding the consequences of population growth on the pace of economic development have, since Malthus, been both vigorous and contentious. While pessimism--indeed alarmism--over the adverse consequences of rapid population growth has dominated the lexicon of popular and, to a lesser extent, scientific discourse, swings in thinking have from time to time occurred. During the Great Depression, Alvin Hansen and the stagnationists cited slow population growth as a cause of aborted or anemic economic recovery. During recent decades the "birth dearth" in developed countries has motivated writers like Ben Wattenberg to forecast long-term economic decline, waning political clout, and the demise of Western values and influence. And during the 1980s the so-called "population revisionists" downgraded the prominence of rapid population growth as a source of, or a constraint on, economic prosperity in the Third World.<sup>2</sup>

This population revisionism appeared to represent a notable retreat from the widely-held "traditionalist," or sometimes "population-alarmist," view of the 1960s and 1970s, that rapid population growth constitutes a strong deterrent to per capita economic growth and development. In contrast, the revisionists have: 1) downgraded the relative importance of population growth as a source of economic growth, placing it along with several other factors of equal or greater importance; 2) assessed the consequences over a longer period of time; and 3) taken indirect

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<sup>2</sup>Hansen (1939), Wattenberg (1987), National Research Council (1986).

feedbacks within economic and political systems into account.<sup>3</sup>

It is to be emphasized that the distinguishing feature of population revisionism is not the direction of the net assessment of population consequences--indeed, most revisionists conclude that many, if not most, Third World countries would benefit from slower population growth. Rather, revisionism is distinguished by more moderate conclusions about the impacts of population growth, considered smaller than in assessments by traditionalists. This result derives directly from the methodological perspective of revisionists that highlights the intermediate to longer run, taking into account both direct and indirect impacts, and feedbacks within economic, political, and social systems.<sup>4</sup>

A striking example of the apparent change in thinking during the 1950-1990 period is illustrated by a comparison of the summary statements on the impacts of rapid population growth found in two major studies undertaken by the prestigious National Academy of Sciences (NAS) in the United States. On the one hand, the executive summary of the 1971 Report, Rapid Population Growth: Consequences and Policy Implications, cites a large number of adverse impacts of population growth, provides almost no qualifications as to the negative effects, and fails to enumerate possible positive or countervailing impacts.<sup>5</sup> On the

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<sup>3</sup>Hodgson (1988) refers to the pre-revisionist period as one of population "orthodoxy," which refers both to hypotheses about family planning, and to the assumption that "... rapid population growth in nonindustrial societies is a significant problem" (p. 542). Demeny (1986) characterizes revisionism succinctly: "The more typical revisionist views, however, merely put the problem in its presumed deserved place: several drawers below its former niche" (p. 474).

<sup>4</sup>Based on the broader view of the development process held by the revisionists, the strong reliance on family planning to confront so-called "population problems" such as rapid urbanization and food deficiencies has also been challenged. Elevated emphasis is instead placed on policies that appear to address the more important causes of these problems, and the justification for family planning has shifted to other factors as a result. These justifications include the desirability of reducing the large number of "unwanted" births, the adverse impact of large families (and close child spacing) on child and maternal health, the flexibility and greater administrative ease in managing a slower pace of development, the adverse consequences of population pressures on selected environmental resources, the impact of population growth on the distribution of income, and the burden of child rearing on women.

<sup>5</sup>The 1971 NAS report classifies population impacts into five major categories. 1) Economically, rapid population growth slows the growth of per capita incomes in the LDCs, perpetuates inequalities of income distribution, holds down saving and capital investment, increases unemployment and underemployment, shifts workers into unproductive pursuits, slows industrialization, holds back technological change, reduces demand for manufactured goods, inhibits development and utilization of natural resources, deteriorates the resource base, and distorts international trade. 2) Socially, rapid population growth results in rapid urbanization, strains intergenerational relationships, impedes social mobility, and widens gaps between traditional and

other hand, the summary assessment of the 1986 Report, Population Growth and Economic Development: Policy Questions, is moderate in tone and substantially qualified: "On balance, we reach the qualitative conclusion that slower population growth would be beneficial to economic development of most developing countries" (p. 90). Examining this carefully worded statement in detail is instructive because it exemplifies several attributes of revisionism: 1) there are both important positive and negative impacts of population growth (thus, "on balance"); 2) the actual size of the net impact--and even whether it is strong or weak--cannot be determined given existing evidence (thus, "qualitative"); 3) only the direction of the impact from high current growth rates can be discerned (thus, "slower," and not "slow"); and 4) the net impact varies from country to country--in most cases it will be negative, in some it will be positive, and in others it will have little impact one way or the other (thus, "most developing countries").

It is intriguing to speculate as to what explains this significant change in thinking. Below we will argue that a major change in thinking did not in fact occur amongst most American economists engaged in scholarly research on the consequences of population growth. Rather, what we may be observing is an increase in the relative influence of the economists vis-a-vis the non-economists in the summary assessments of the major reports, and in public debate. As a result, highlighting a significant shift toward "revisionism" among economists in the 1980s may be inappropriate. Most prominent American economic-demographers, especially those with an historical bent, have for decades embraced the perspectives of population revisionism--arguably the dominant posture in economics in the post WW II period.

There are several hypotheses accounting for an elevation of the influence of economists, and revisionists, in the population debate in the 1980s. First, a gradual accumulation of empirical research weakened the foundations of the traditionalist case. Second, the theory of economic growth itself changed: it elevated the importance of human capital accumulation and technical change vis-a-vis land and natural resources; and it

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other sectors. 3) Politically, rapid population growth worsens ethnic/religious/linguistic conflicts, administrative stresses, and political disruption. 4) In terms of family welfare, rapid population growth inhibits the quality and quantity of child education, lowers maternal and child health, retards child development, and produces crowded housing and urban slums with associated illnesses. 5) And in terms of the environment, rapid population growth stimulates agricultural expansion which in turn results in soil erosion, water deterioration, destruction of wildlife and natural areas, and pollution; and pesticides poison people, and domestic and wild animals (NAS, 1971, pp. 1-4).

downgraded the relative role of physical capital accumulation.<sup>6</sup> Third, the importance of institutions--in particular, the roles of governments and economic policies, markets, and property rights--as sources of growth has diverted attention from some specific factors in development, including population. Fourth, the analysis of demographic factors has been broadened to include indirect, as well as direct, effects, and to encompass the intermediate to longer run.

And finally, the elevated influence of the ideas of Julian L. Simon (1981) on the Reagan Administration's population policies, which were unsupportive of family planning, in part triggered the commissioning of the 1986 National Academy assessment of population consequences.<sup>7</sup> This assessment was undertaken almost entirely by economists, the revisionists. Interestingly, amongst non-economists, revisionist orthodoxy has never gained a notable foothold. This group is sizeable and includes demographers, biologists/ecologists, and sociologists. By numbers, then, the economist/revisionists have exercised exceptional influence in the debates over the last decade, a phenomenon this essay assists to understand and place in perspective.

## 1.2 Goals

The primary goal of the present essay is to identify and assess those key aspects of the population debate that have since 1950 influenced the prominence of population revisionism amongst scholars in the United States. This focus delimits the essay. First, rather than surveying the large literature on the consequences of population growth, we will highlight only those areas where research and events appear to have most influenced the prominence of revisionism.<sup>8</sup> Second, we will focus somewhat narrowly on the American debate. Finally, we will examine only the roles of academics, and mainly the roles of economists. The swings in thinking about population matters may have been influenced much more by the United States Agency for International Development, the United Nations Fund for Population Activities, the Population Council, the Ford and Rockefeller Foundations, and key leaders associated with these and other institutions. The roles of these institutions, and their

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<sup>6</sup>The traditionalist argument relied heavily on the concern that high fertility and thus high dependency rates would reduce investment in physical capital, thus reducing growth.

<sup>7</sup>For details on the NAS Report, see section 2.4 and footnote 19.

<sup>8</sup>Surveys are provided by Birdsall (1988), Kelley (1988), McNicoll (1984), National Research Council (1986), Srinivasan (1988), and World Bank (1984).

interactions with academics, are both important and complex, and constitute a central place in a full assessment of the history of the population debate.<sup>9</sup>

Another goal of the present essay is to provide the background needed to place the choice of topics and the various findings of the Bellagio symposium in perspective. We attempt to accomplish this by reading the literature on the population debate through the filter of "revisionism," a history-of-thought, stage-setting exercise that is hopefully both interesting and enlightening.

### 1.3 Argument

Section 2.0 documents the proposition that the perspective of revisionism has in fact been the dominant posture of economic-demographers since 1950. This is in spite of an apparent ebb and flow of "traditionalism" versus "revisionism" over this period--a swing in ideas we consider to be more illusory than substantive. Our approach is to review four benchmark studies that provide a reasonably comprehensive overview of the literature: the 1953 and 1973 United Nations Reports on The Determinants and Consequences of Population Trends, and the 1971 and 1986 National Academy of Sciences Reports cited above.

Insight into the reasons for the apparent ebb and flow of ideas centers on three hypotheses: 1) swings in the relative number of economists vis-a-vis other scholars participating in the population assessments (Section 2.0); 2) the stimulus (and some of the results) of Julian L. Simon's The Ultimate Resource in 1981, as well as a waning influence of the seminal 1958 study by Ansley J. Coale and Edgar M. Hoover (Section 3.0); and 3) the impact of accumulated empirical evidence from the 1970s and early 1980s, summarized in several survey papers in the 1980s that qualified the traditionalist case (Section 4.0). Research in the early 1990s leading up to the Cairo Population Conference did not notably modify this assessment, although a somewhat greater

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<sup>9</sup>On the formulation of United States population policy toward the Third World, and the role of the United States Agency for International Development, see Donaldson (1990) and Piotrow (1973). On the role of the Ford Foundation, see Caldwell and Caldwell (1986) and Harkavy (1995). On the potent and pervasive impacts of funding agencies on the scope of social science research, see Demeny (1988), who issues a vivid assessment: "Social science research directed to the developing countries in the field of population has now become almost exclusively harnessed to serve the narrowly conceived short-term interests of programs that embody the existing orthodoxy . . . . the population industry professes no interest in social science research that may bear fruit, if at all, in the relatively remote future. . . . It seeks, and with the power of the purse enforces, predictably, control, and subservience. . . . Research so characterized is an oxymoron" (p. 471). And on the forces that caused the metamorphosis of the scholar-scientist-demographer of the early 1950s into the policy oriented-programmatic/nuts-and-bolts family-planning activist in the ensuing decades, see Hodgson (1983).

emphasis on microeconomic outcomes emerged, as well as some new macroeconomic results (Section 5.0).

## 2.0 Benchmark Reports

This section provides evidence to support the interpretation that the wide swing away from, and then back toward, population revisionism, as reflected in four of the major reports on the consequences of population growth since 1950, is more apparent than real.<sup>10</sup> In fact, this "swing" is largely an artifact explained by the anomalous executive summary to the 1971 NAS Report. In contrast, the swing in thinking by economists who contributed to this, and the other reports, is much narrower.

### 2.1 United Nations (1953)

The 1953 UN Report represents the most systematic and comprehensive assessment of the consequences of population growth since Malthus. Balanced in scope, it took both positive and negative effects of population into account, distinguished between short- and long-run impacts, and reckoned both direct and indirect effects. The Report offers a guarded net-impact assessment, stressing diversity according to country-specific conditions.

The chapters on the economic consequences of population are authored mainly by Professor Joseph J. Spengler, who can be considered the founder of modern economic demography in the United States.<sup>11</sup> The Report embraces the three distinguishing attributes of population revisionism.

1) On differentiating between short- and long-run impacts of population due to "fixed" supplies of natural resources in the face of diminishing returns, the Malthusian dilemma, the Report observes:

Natural conditions are of two sorts: "constants," which are to a certain extent beyond man's control, and "variables," which are "revealed" by human ingenuity and imagination. There is no fundamental dichotomy between the two. In different times and places,

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<sup>10</sup>While the World Development Report 1984 (taken up below) also represents a watershed publication in the development of revisionist thinking, we elect to focus on the UN and NAS reports here since the timing of their assessments (15 to 20 year apart) more clearly shows the evolution of thinking over time.

<sup>11</sup>Spengler wrote the chapters on the consequences of demographic change on 1) natural resources, 2) migration and distribution, and most importantly, 3) per capita output. He in addition wrote the chapter on the history of population theory.

variable factors may be considered a constant, and vice versa. Modern industrial societies are continuously transforming what were long considered negative binding conditions into positive variables which can be manipulated. (p. 181)

Similarly, and referring to capital-labor ratios as expressed in production-function equations, the Report observes:

An increase in the population and labor force, with all other circumstances unchanged, would tend to reduce per capita output by reducing the amount of physical resources and equipment employed per worker. ...the value of such equations as expressions of the relationships between population and output is rather limited, because the assumption that other factors remain constant is unrealistic. In real life, all factors affecting output change simultaneously; hence it is necessary to ask: what change in the non-human factors of production may accompany given changes in population and in the labor force? The answer depends on many circumstances.... (p. 237)

This longer-run perspective permeated the Report, and played an important role in accounting for its somewhat eclectic and moderate assessment of the net impact of population.

2) On employing a balanced assessment of the connections between population and development, the Report lists some 21 economic-demographic linkages.<sup>12</sup> The impact of population on some factors is judged to be positive (scale, organization); on some, negative (diminishing returns); and on some, neutral (technology and social progress).

3) On taking indirect impacts of population into account, the Report is clear:

For the purpose of analyzing the relative importance of demographic and other factors bearing on output, a nearly complete list of them is required. Otherwise the partial and current influence of some factors may not adequately be taken into account. Such a list guards against the neglect of significant variables, especially when the factors are many and somewhat interdependent. (p. 221)

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<sup>12</sup>This taxonomy, which effectively established the research agenda of economic demographers over the coming decades, was originally expounded in Spengler (1949).

Based on these three elements of the revisionist perspective--attention to the longer run, numerous positive and negative impacts, and considering indirect effects--the Report's bottom-line assessment follows. It mirrors current revisionist assessments (including the 1986 National Academy of Sciences Report) that emphasize the diversity of impacts, although a negative net impact of undetermined size is considered by the UN Report to be likely in much of the Third World:

An increase of population may tend to raise per capita output in industrialized countries having a tendency towards unemployment, or in countries with ample undeveloped resources that can readily be put to use. On the other hand, in countries where for any reason it is difficult to match population increase with a corresponding development of non-human resources, the effect of population growth may be to hinder the rise of per capita output, in particular where it hinders the formation of capital. (p. 237)

Two factors play a significant role in explaining the guarded nature of the Report's eclectic assessment: uncertainty regarding the importance of mismatches of non-human resources to labor and of the impacts of population on saving and investment. On mismatches, the Report stresses the role of international trade and migration in conditioning and mitigating population impacts.<sup>13</sup> On saving and investment, the Report observes the theoretical ambiguities resulting when indirect linkages are taken into account and emphasizes the need for empirical analyses into the postulated relationships. This second qualification in fact turned out to represent a primary research emphasis in population assessments for the next two decades. The results of this research played an important role in tilting the population debate toward revisionism in the 1980s.

## 2.2 United Nations (1973)

Updating the earlier UN Report, the 1973 volume veers somewhat from the revisionist thinking. The bottom-line assessment of the consequences of population growth is more pessimistic as a result. However, this assessment is notably qualified by the empirical studies of Simon Kuznets.

... rapid population growth in developing countries may impose a heavy burden on society. ...growth of income would be faster, the slower the growth of population.

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<sup>13</sup>"...the world's ability to support a growing population on a rising level of living would be improved by the easing of restrictions on international trade and migration..." (p. 193)

These findings, however, are not completely corroborated by the available empirical findings. Country data show no consistent association between the rate of growth of population and the rate of growth of total product during the 1950s and 1960s. ...rapid population growth does not preclude economic improvement. While the rate of population growth may not be one of the predominant factors determining the rate of economic growth, there appears to be a consensus that high population growth rates have held back advances in levels of living.... (p. 6)

The basis of the Report's greater pessimism is uncertain since in terms of empirical analysis, the summary statements are quite guarded.

... the effect of demographic trends on economic development... is a complex one involving so many interdependent factors that it has not proved possible to isolate the demographic influences. ... systematic study of the relationship of demographic trends to the many factors influencing productivity--methods of production, specialization, economies of scale, skills of the labor force, advances in technology, etc.--is not yet far advanced. ... relatively few hypotheses and models have been established to explain the interrelationships among population, education and economic development. (p. 8)

Possibly it is the alleged adverse impacts of population growth on the food balance and on capital formation, as represented in two of the background papers, that accounts for the Report's somewhat pessimistic assessment.<sup>14</sup>

With respect to the food balance, where the Report forecasts a trend of diminishing per capita food production in the Third World, the traditionalist methodology is clear:

Whereas population growth increases requirements for food and... is also by far the main factor in the growth of the demand for food, there is no such direct relationship between population and the growth of

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<sup>14</sup>In a conversation with Dr. Leon Tabah (September 3, 1991), who arrived at the UN in time to head the compilation of the final report, he reported that the overview chapter was authored by several persons in the Population Division, was vetted widely within the UN, and benefitted in particular from feedback solicited from Professors Ansley J. Coale and Nathan Keyfitz. These distinguished scholars, known for their significant concerns about the adverse consequences of rapid population growth, may have played a role in tilting the 1973 Report away from the more eclectic posture of the 1953 UN volume.

production (emphasis mine). (p. 433)

The analysis is sensitive to the focus on the direct impacts of population growth, and to a shorter-run technological orientation that downplays indirect impacts in the longer-run due to price responses, and induced innovation and institutional change.

With respect to capital formation, the Report concludes that:

...other factors being equal, a decrease in saving capacity occurs as the size of the family... increases (emphasis mine). (p. 503)

Again, this represents a short-run perspective. Induced indirect impacts on family labor supply and substitutions in consumption are downplayed. While the background paper by Paul Demeny qualifies the quantitative importance of the possible savings impacts of large families and of capital shallowing when other factors are taken into account, these two impacts represent the only unequivocal (negative) population-economic connections in the paper's summary. Moreover, they were central to the traditionalist analytical perspective of the then-popular and influential Coale-Hoover model, discussed below. As a result, they plausibly carried considerable weight in the deliberations.

The most significant new contribution to the population debate in the 1973 Report was the finding by Simon Kuznets that, based on simple correlations, a net negative impact of population on per capita output growth was not obvious in the data. This result qualified the quantitative importance of population's hypothesized net (and negative) impact and played a major role in the deliberations. (Around half of the Report's summary assessment is devoted to presenting and interpreting Kuznets' qualifications.) Given the strong priors of demographers and policy makers that the negative impacts of population growth on development were large, the inability to easily "confirm" this hypothesis through simple, albeit inconclusive, correlations more than any other factor kept the population debate alive and encouraged the elevation of population revisionism during the next two decades.<sup>15</sup>

In sum, the 1973 Report tilted away from population

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<sup>15</sup>Kuznets' findings have been replicated in over a dozen studies. For a summary and assessment of this literature, see Kelley (1988, pp. 1700-01). While such correlations are sufficiently difficult to interpret so as to be almost meaningless, ironically had they "confirmed" the negative priors, it is likely that the debate would have been largely put to rest. For an early application of these correlations to the debate, see Richard A. Easterlin (1967). For an update on the correlations literature, see Kelley and Schmidt (1994).

revisionism, as we characterize it. Two of the three background papers highlight direct, shorter-run impacts, although the one by Demeny is qualified. The remaining paper by Kuznets is distinctly revisionist--long-run in orientation and based on a broad theoretical and historical perspective. It effectively provides a counterbalance to the Report's net assessment, which is broadly faithful to the background papers.

### 2.3 National Academy of Sciences (1971)

The same cannot be said for the Report by the National Academy of Sciences in 1971 which, in the history of the major studies of population growth, seemingly represents the most traditionalist (and in this case population-alarmist) in perspective. Caution in arriving at a firm judgment on this matter results from the striking gap between the assessment found in the "Overview" summary in Volume I (ch. 1), and the results found in the research papers in Volume II.<sup>16</sup>

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<sup>16</sup>In spite of exhaustive inquiries of the NAS, USAID, and seven of the participants in the NAS Report, it has not been possible to identify with certainty the author of "Overview," chapter 1, volume I ("Summary and Recommendations"). Somewhat surprisingly, NAS archives contain no information on the Report. And according to representatives at the USAID, the relevant files appear to have been retired. Direct participants were later vague about authorship. (I talked with Professor Revelle twice in the summer of 1991 to obtain his impressions on the drafting and vetting of "Summary and Recommendations" in general, and "Overview" in particular. While he recalled drafting a version of the summary, his memory was not sufficiently precise to form firm judgments. He died two weeks after our last conversation.) According to one observer, key leadership within USAID was "...unhappy with earlier versions of the summary. ...There was enormous pressure on the NAS staff to 'deliver' a supportive document." Ansley Coale, unable to accompany Revelle to an AID briefing on the Report, recalls remarking to Revelle a week later that he (Revelle) must have been disappointed in him. Revelle's response was unambiguous: "You're damned right I am." Apparently, AID's reception of the NAS-Revelle draft was not particularly satisfying.

Most participants contacted concluded that the NAS staff drafted the "Overview." None remembers reviewing that draft. Several participants were surprised by the strong negative orientation of the "Overview." One wrote with respect to a major section in the "Summary and Recommendations": "As I go back to the book and look at the two parts which pertain to the puzzle, I am as baffled as you are as to who might be responsible for having run them." Another participant, who examined the "Overview" in detail, noted: "I am deeply offended that a product put together with a lot of effort to avoid simplistic traps was perverted by ad hoc interference with the highly visible first few pages. I didn't see the "Overview" until I got a copy of the book, and I didn't examine it with care until your phone call." His review revealed several inconsistencies between the "Overview" and the research chapters.

The above analysis, pieced together from notes on numerous conversations with, and letters from, participants in the NAS report, has been subsequently corroborated by documents received from Professor George Stolnitz, a central figure in the drafting of Volume I. The Stolnitz documents included Revelle's (1969) draft of the executive summary (entitled "The Consequences of Population Change, and Their Implications for National and International Policies"), which was dramatically different in tone and conclusions from the published "Overview."

According to Stolnitz, the Revelle draft "didn't pass muster" with Mr.

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Murray Todd (and with persons Todd consulted), the NAS staff professional attached to the project. Stolnitz was asked by Todd to so inform Revelle, and to work with Revelle (and other committee members) on a revision. The Revelle draft was non-alarmist in tone and represented a guarded treatment. For example, after considering population's commonly-cited negative impacts on natural resource use, investment, savings, and dependency, Revelle concluded: "All of the above effects taken together are relatively small" (Revelle 1969, p. 13). In terms of overall assessment, Revelle concluded: "There is, as yet, little public or expert agreement about the nature and extent of the effects of rapid population growth, their importance relative to other factors of development, their interrelations with these factors... Hence, it is difficult to determine the direction and relative level of effort that should be given to programs aimed toward the reduction of population growth..." (Revelle 1969, p. 5). Revelle emphasized the need for objective assessment of population impacts, and warned against one-sided alarmism. "Discussions of the population problem are too often highly charged with emotion, fear and passion. Drastic predictions of widespread famine... are commonly made and widely believed. ...the problem of sufficient food for the world's growing population probably can be solved, and its solution involves many factors besides slowing down rates of population growth" (Revelle 1969, p. 8). Given these various statements, it is difficult to believe that Revelle would have embraced the resulting "Overview" which is decidedly one-sided, and alarmist in orientation. (There is evidence he had read "Overview." Revelle 1971, p. 1.)

Based on a careful review and analysis of a sizeable number of documents relating to the NAS study, Stolnitz concludes that it is almost certain that chapter 1 was written by Murray Todd. Apparently early-on (October 1969), the planning committee sought, as is characterized by Oscar (Bud) Harkavy's paraphrased rendering in a memorandum written by Todd (1969), "... a number of crisply stated propositions on the consequences of population growth" (p. 1). (The final "Overview" in fact took this format.) Additionally, the planning committee sought "...the opportunity to set to rest some of the popular myths that currently surround the population question, for example that world famine can confidently ... (blurred in manuscript) in the 1970's" (Todd 1969, p. 1). (The final "Overview" did not in fact include this material.)

Stolnitz concludes that "The indicated pile-up of unfavorable aspects of third world population change in chapter 1, presented in staccato fashion, [is] an editor's expository ploy to catch the attention of the hurried, abbreviated perusals to be expected by D.C. and other targeted doers and shakers" (Stolnitz 1991, p. 1). Why such a rendering passed Revelle's scrutiny, why it was not vetted by the remaining committee members, and why it was so one-sided--given the desire to qualify "myths" (equally eye-catching)--remain as puzzles.

A final observation on Mr. Todd's role should be recorded. If, as is highly likely, Mr. Todd drafted (and/or negotiated) the executive summary, it is clear that he was under extensive pressure from powerful population activists in the Department of State, USAID, and some NGOs. It may be unreasonable to expect a person in such a role to fully withstand such pressure.

I am grateful for feedback on aspects of this Report from Ansley J. Coale, Moye Freyman, Oscar Harkavy, Hans Landsberg, Thomas Merrick, Carol Pichard, Roger Revelle, Norman Ryder, Steve Sinding, T. W. Schultz, and Myron Weiner. Both the NAS and USAID were completely cooperative in attempting to locate documentation relating to the NAS report. I especially thank George Stolnitz, who sorted through and commented on hundreds of pages of manuscript materials relating to the NAS study, available in his personal files. His detailed analysis of these documents provided pivotal insights into assessing the relationship of the "Overview" chapter (summarizing the NAS study) to the positions of the analysts associated with the report, and the background papers.

The assessment in Volume I (ch. 1) is highly pessimistic, citing a large number of ways in which "... high fertility and rapid population growth have serious adverse social and economic effects" (p. 1).<sup>17</sup> This seriousness is underscored by a quantitative speculation that a one-quarter reduction in birth rates from 40 to 30 could raise per capita income growth rates by one-third (p. 25). Most of the impacts that are listed are unqualified, and no significant positive contributions of additional population numbers are noted. The Report explicitly employs traditionalist methodology that highlights direct impacts in the short run. Indeed, the Preface notes that "We have limited ourselves to relatively short-term and clear-cut issues..." (p. vi).

In contrast, the research papers that take up the economic consequences of population in Volume II are in general much less pessimistic, and they employ the perspective of revisionism. Three examples suffice.

Theodore Schultz' paper on "The Food Supply-Population Growth Quandary" is reasonably optimistic, forecasting increases in per capita food production (assuming governments do not return to their former cheap food policies). The paper discounts the scientific validity of many of the pessimistic food-balance projection models for failing to incorporate appropriate price and induced supply responses. Schultz notes that, while rapid population growth leaves little room for complacency, the major food-balance problems relate to non-demographic factors.

Harvey Leibenstein's paper on the "Impact of Population Growth on Economic Welfare--Nontraditional Elements" highlights the role of human capital in economic growth and the advantages of a youthful population that incorporates relatively large amounts of up-to-date human capital (denoted as the "replacement effect"). Given the then postulated importance of non-traditional (or "residual") factors as sources of economic growth, Leibenstein concludes that the positive impact of the replacement effect may be quantitatively large. While he felt that, on average, rapid population growth likely deters economic development, he held that the size of this impact was uncertain.<sup>18</sup>

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<sup>17</sup>See above, footnote 5.

<sup>18</sup>Leibenstein's posture can be characterized as "leaning against the wind" of population pessimism. "...even in developing countries, there may be situations and periods for which relatively high rates of population growth may involve some demographic effects that are helpful to economic growth. Whether the beneficial effects are ever the predominant ones is hard to say..." (p. 194) "...even the positive replacement effect must be considered as only one element among many--most of which probably inhibit economic growth. The positive

Paul Demeny's paper on "The Economics of Population Control," while dealing mainly with externalities, is highly skeptical about summary assessments of population's net impact, since

An adequate treatment...would have to embrace virtually all important problems having to do with the economics of development and could be handled satisfactorily only in a general equilibrium framework involving fertility itself as a dependent variable. No such treatment yet exists or is in sight.... (p. 202)

Moreover, Demeny is critical of current assessments since "... the emphasis that has been given to short-term considerations appears to have been disproportionately strong..." (p. 205), a proposition supported by revisionism.

In summary, while the background research papers by the economists participating in the 1971 study are revisionist in orientation, a traditionalist and strongly alarmist assessment is presented in the summary Overview. This represents a watershed in population pessimism in the period since 1950.

#### 2.4 National Academy of Sciences (1986)

In striking contrast, the next NAS Report returned to revisionist thinking and, as noted above, provided a guarded and qualified assessment on the net impact of population growth on development. Three factors account for this about face.

First, the Report emphasizes both individual and institutional responses to initial impacts of population change--conservation in response to scarcity, substitution of abundant for scarce factors of production, innovation and adoption of technologies to exploit profitable opportunities, and the like. These responses are considered to be pervasive and they are judged to be important. According to the report-writers:

...the key [is the] mediating role that human behavior and human institutions play in the relation between population growth and economic processes. (p. 4)

Second, empirical studies that had appeared in the literature since the 1971 Report qualified many of the hypotheses central to the population debate. This is true, for example, of the impacts of children on household saving, as well as the impacts of population growth and size on government spending and

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replacement effect is delineated primarily in the interest of achieving a balanced approach..." (p. 195)

on educational enrollments.

Third, unlike previous summary reports, the 1986 study was compiled almost entirely by economists whose summary assessments in the overview volume are faithful to the background papers, also compiled mainly by economists.<sup>19</sup> Economists' understanding of, and faith in, the potential for market-induced responses to modify initial direct impacts of population change is far greater than that of other social and biological scientists, who were prominent contributors to previous NAS reports.<sup>20</sup> In this regard, it is not surprising that the negative impact of population growth highlighted in the 1986 Report takes the form of renewable resource degradation. It is here that markets can fail since property rights are difficult to assign or maintain, especially for rain forests, fishing areas, and the like.

## 2.5 Bottom Line: Reports and the Economists

Since 1950, several of the major reports on the consequences of population growth in the Third World have appeared to move between the guarded revisionist assessments of 1951 and 1986, and the stronger- to strong-traditionalist assessments in the 1973 UN and 1971 NAS reports, respectively. In contrast, most of the background papers commissioned for these reports and written by economic-demographers can be classified as revisionist, including the papers for the 1971 NAS study. As a result, deviations from the revisionist tradition tend to be attributable more to the changing influence of non-economists than to changes in the

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<sup>19</sup>The Working Group on Population Growth and Economic Development included D. Gale Johnson (co-chair), Ronald D. Lee (co-chair), Nancy Birdsall, Rodolfo A. Bulatao, Eva Mueller, Samuel H. Preston, T. Paul Schultz, T. N. Srinivasan, and Anne D. Williams. The study was originally proposed by Steven Sinding, then Director of the Office of Population at USAID, to Robert Lapham and David Goslin. Eugene Hammel chaired the Committee on Population (1983-1985). The Working Group was primarily economists since the study's focus was ostensibly "economic development." The Working Group set the scope and outline of the project. The background papers were presented at a workshop at Woods Hole, attended mainly by the authors and the NAS working group. The first draft of the summary Report was primarily written by Samuel Preston, although Ronald Lee wrote the first draft of chapter 4, and Geoffrey Green parts of chapter 8. This draft was reviewed, page-by-page, at meetings of the Working Group. In the end, one member would not "sign off" until three issues had been resolved. Because the report was considered to be potentially controversial, it received exceptionally diligent assessment through the standard reviewing process of the National Academy of Sciences. It is notable that this process and the writing of the executive summary, unlike the setting at the NAS in 1971, was largely absent the external pressures of USAID. This was due to the active participation by the academics in the process (including the writing of the executive summary), and to the role of Steven Sinding at USAID. I am grateful to Sam Preston and Gene Hammel for providing detailed background relating to the 1986 NAS study.

<sup>20</sup>The 1971 committee of 12 members contained 3 economists. Of the 18 persons acknowledged as contributing to the study, 3 were economists. And 4 of the 19 background papers were written by economists.

thinking of economists. Revisionism appears to be the dominant methodological perspective amongst economic-demographers in assessments of the consequences of population growth.

### 3.0 Foundations and Challenge

In assessing the changing prominence of revisionism since 1950, the contributions of three scholars merit particular attention: Ansley J. Coale and Edgar M. Hoover, who helped establish the foundations of traditionalism in the 1950s; and Julian L. Simon, who helped mount the revisionist challenge.

#### 3.1 Ansley J. Coale and Edgar M. Hoover

No single publication has had a greater impact on the population debate since 1950 than Population Growth and Economic Development in Low-Income Countries, the Coale and Hoover (1958) study on Mexico and India. Pioneering in several dimensions, this book: 1) articulated several theoretical linkages between population and economic growth that were consistent with the economic-growth paradigms of the time (e.g., an emphasis on physical capital formation); 2) formalized these linkages in a mathematical model that was parameterized and simulated to generate forecasts of alternative fertility scenarios over the intermediate-run; and 3) provided a case study of an important country whose prospects were considered by many analysts to be grim. The Coale-Hoover framework was transparent and easy to understand, the assumptions were made explicit and qualified, and the findings were clearly expounded and accessible to a wide readership.

The model identified, and the simulations quantified, three adverse impacts of population growth: 1) capital-shallowing--a reduction in the ratio of capital to labor because there is nothing about population growth *per se* that increases the rate of saving; 2) age-dependency--an increase in youth-dependency, which raises the requirements for household consumption at the expense of saving, while diminishing the rate of saving; and 3) investment diversion--a shift of (mainly government) spending into areas such as health and education at the expense of (assumed-to-be) more productive, growth-oriented investments.

These hypotheses had a substantial impact on thinking. They formed the basis of most modeling of population up through the 1970s. They figured prominently in the 1973 UN Report. And, according to political scientist and policy analyst Phyllis T. Piotrow (1973), the Coale-Hoover thesis "... eventually provided the justification for birth control as a part of United States foreign policy" (p. 15).

The Coale-Hoover framework both established and sustained

the traditionalist perspective over the 1960s and 1970s. The model: 1) focused on the short- to intermediate-run when adverse consequences of population are greatest; 2) abstracted from induced feedbacks through economizing or substitution in the face of population pressures; and 3) omitted any direct positive impacts of population on per capita output growth (e.g., scale economies). Even though advances in economic theory in the 1960s and 1970s greatly diminished the model's relevance (e.g., theory elevated the roles of human capital, non-traditional factor inputs, technical change, and policies and institutions as sources of growth), and even though accumulating evidence discounted the quantitative importance of the hypotheses relating to capital-shallowing and the adverse impacts on saving, the model's influence did not wane until the 1980s.

### 3.2 Julian L. Simon

The decline in the model's influence was in part the result of the writings of Julian L. Simon. First, his book The Ultimate Resource in 1981 attracted enormous attention to the population debate. This was due both to his conclusion that in the intermediate-run, rapid population growth was likely to exert a positive impact on economic development in many Third World countries; and to the effectiveness of the book's highly accessible exposition and "debating style." (The format included goading and prodding, setting up and knocking down of strawmen, and examining albeit popular but some rather extreme anti-natalist positions. Arguably not since the Malthus-Godwin confrontations has this debating style been more effectively used to garner attention to the central elements in the population debate.) While the theoretical linkages and empirical assessments (particularly those relating to technical change) that formed the basis of Simon's optimistic conclusion drew vigorous challenge, it is important to recognize that his results were fundamentally based on the application of the revisionist methodology that had been embraced by most economic-demographers for several decades. In particular, Simon focused on the longer run, and he stressed the importance of feedbacks, especially those resulting from price-induced substitutions in production and consumption in the face of population pressures.

The best example relates to his demonstration that most natural-resource prices (in real or relative terms) trace out a long-run decline in the face of rising demands, stimulated, in part, by expanding populations. Price-induced substitutions in production and consumption, and an expansion of supply, are offered to explain this result. While such a finding is not surprising to economists [see Spengler (1966) and Kuznets (1967)], the effectiveness of Simon's writing style and argumentation is nowhere more evident than in his analysis of

population-resource interactions.<sup>21</sup>

A second impact of Simon's book derives from its catalytic role in stimulating several systematic re-assessments of the consequences of population growth. These took the form of several literature surveys that brought to light research that had quietly accumulated since the early 1970s. While most of this research (including much of Simon's own work) had exerted a negligible impact on the broader population debates, when collected together, assessed in the context of current theories of economic development, and organized around population themes, the several surveys served to elevate the revisionist perspective. All of the surveys turned out to be less pessimistic than those prevailing in the 1970s.

#### 4.0 1980s

A review of the methodological emphases and bottom lines of these surveys provides additional confirmation that revisionism was the dominant perspective of the 1980s. While each survey concluded that slower population growth would likely be beneficial to the development of many countries (recall that a net negative assessment is not a distinguishing feature of revisionism), none of the surveys was alarmist; none was short-run in perspective; all emphasized the multi-dimensional (positive and negative) aspects of population's consequences; several explicitly downplayed the "traditional" emphasis on diminishing returns, natural resource exhaustion, and negative savings linkages; and all were responsive to updated theoretical perspectives that highlighted human capital, technical change, public policy, and institutional settings.

#### 4.1 Surveys

The *World Bank's World Development Report* (1984) may appear at first glance to fall into the "pessimist" camp of population-consequences assessment. After all, the Report noted up front that exceptionally rapid "...population growth--at rates above 2

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<sup>21</sup>For example, Simon's population-resource arguments appeared to have been settled in the mind of Spengler and other specialists many years earlier. "Perhaps the greatest reversal of opinion in the period 1930-65 is that relating to the role played by land and other natural resources in economic development and the disenfranchising of populations from Malthusian traps. ... discovery and technological change, together with substitution at producer and consumer levels, have greatly augmented both the visible and the immediately potential stock of fuel, mineral, and related sources of natural-resource services. Man, it is supposed, is confronted by chains of natural-resource substitutes which modern molecular engineering and alchemy can subvert to his purposes, replacing links that weaken and elevating inferior sources (e.g., taconite rock) as well as substituting less expensive for more expensive sources of particular natural resource service needs." Spengler (1966), p. 9.

percent...--acts as a brake on development" (p. 79). But the Report immediately qualifies that statement: "Up to a point, population growth can be accommodated..." although in terms of advancing economic well being, there has been "less progress than might have been..." (p. 79). The Report admits a wide diversity of experience. In arriving at its conclusions, it 1) strongly downplays the impact of population growth as a significant deterrent to saving; 2) elevates in importance the likely adverse impacts of population growth on human capital accumulation, and poverty; and 3) recognizes that in some countries larger populations can favorably enhance prosperity through scale economies and market demand. Thus, the 1984 World Bank assessment, like the 1986 National Research Council assessment two years later (discussed above), falls solidly into the revisionist camp. Overall, these two reports, according to Nancy Birdsall (who headed the World Bank Team, and who was also a member of the National Research Council Working Group), conclude that "...rapid population growth can slow development, but only under specific circumstances and generally with limited or weak effects."<sup>22</sup>

One difference between the reports merits emphasis. The World Bank placed somewhat greater weight on the negative consequences of market and institutional failures, which are in turn exacerbated by population pressures. However, both reports stressed that demography played mainly a contributory, in contrast to a causal, role in accounting for several of the development problems commonly attributed to population growth.

*McNicol's* (1984) survey concludes that "...rapid population growth is a serious burden on efforts to generate sustained increases in per capita product" (p. 212). But he too downplays the traditional saving linkages, recognizes a modest role for scale, and is impressed by positive impacts of population pressures in stimulating innovation. His strongest negative assessments relate to non-economic factors: demographic impacts on kinship structures and international relations. Again, his perspectives are revisionist: longer-run in orientation, multi-dimensional, and especially sensitive to a wide array of economic, and especially social and political, feedbacks.

*Kelley's* (1988) survey concludes that "...economic growth...would have been more rapid in an environment of slower population growth, although in a number of countries the impact was probably negligible and in some it may have been positive" (p. 1715). Emphasis is placed on the diversity of settings whereby adverse impacts are likely: specifically, where 1) water and arable land are scarce, 2) property rights poorly defined,

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<sup>22</sup>Birdsall (1988, p. 529).

and 3) government policies ineffective and biased against labor. Caution is highlighted in treating many popular "problems" as largely demographic (e.g., unemployment, malnutrition, famine, environmental degradation) since they are mainly caused by more fundamental factors, and are exceptionally sensitive to the appropriateness and efficacy of public policy.

*Srinivasan's* (1988) survey parallels the conclusions of the 1986 NAS Report discussed above, to which he was an important contributor. He further argues that highlighting pervasive and significant externalities with respect to household fertility decisions is mistaken, and that "...many of the alleged deleterious consequences result more from inappropriate policies and institutions than from rapid population growth. Thus policy reform and institutional change are called for, rather than policy interventions in private fertility decisions to counter these effects" (p. 7).

*Birdsall's* (1988) survey illustrates well an additional dimension of revisionism. She argues for a broad perspective whereby population consequences are viewed as "...the outcome of many individual decisions at the micro or family level, and thus one aspect of a larger complex system" (p. 493). Accordingly, she not only recognizes and accounts for feedbacks that mitigate problems of resource scarcity due to population pressures, she also extends the analysis to the microeconomic level and emphasizes the endogeneity of parental decisions with respect to family size and investments in children. In this context, she places somewhat greater weight than some others on the possible size of the negative consequences of market and institutional failures that distort parental decision-making with respect to childbearing and rearing.

#### 4.2 Revisionist Consensus

One might venture that at the end of the 1980s there was an uneasy consensus amongst the economist participants in the population debate that broadly embraced revisionism.<sup>23</sup> On the one hand, the consensus was held together by considerable agreement on several empirical propositions, as well as the identification of areas where population assessments were quite inconclusive. These have been evaluated in the literature surveys of the 1980s (see Section 4.21 below). In particular, there was a shift away from the concern about the impacts of population growth on resource exhaustion and on physical/human capital accumulation, and a shift toward a concern about renewable resource degradation. On the other hand, the consensus

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<sup>23</sup>Recall that, for the most part, revisionism has never gained a foothold amongst non-economists to the population debates.

was threatened both by the inconclusive nature of research on some areas of potential impacts (e.g., poverty) of rapid population growth, and by disagreement over the importance of various feedbacks in the analysis of demographic change. Of particular relevance are the ways in which government policies should be viewed, and the importance of population-induced technical change in agriculture. (A summary of the debates on connections between demographic and institutional change is taken up in section 4.22.)

#### 4.21 Empirical Propositions

While there are numerous areas where research has provided a firmer grounding of population impacts, four emerged in the 1980s and notably influenced the elevation of revisionism.<sup>24</sup>

Non-renewable resource exhaustion. The concern that population growth results in the exhaustion of non-renewable natural resources is misplaced.<sup>25</sup> The relationship between population growth and global resource use is not as strong as has been assumed.

This conclusion is based on studies of 1) the determinants of resource supply and demand (related most strongly to per capita income); 2) the relative importance of price-induced versus serendipitous technological change on resource discovery and efficiency of use, and lowered costs of extraction; 3) the responsiveness of conservation in the face of resource scarcity; and 4) an assessment of the efficacy of markets and political processes in allocating exhaustible resources over time.<sup>26</sup> Population revisionism, based as it is on a broad theoretical perspective, the longer run, and feedbacks, is no better illustrated than in an analysis of the resource-exhaustion issue.

Saving and investment. The concern about a substantial reduction of saving due to rapid population growth is not sustained by the data. While some capital-shallowing occurs, the impact of this on economic growth is not particularly strong.

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<sup>24</sup>Other areas include assessments of the impact of population growth on unemployment, urbanization, pollution, scale economies, technical change, and the health of children and mothers. In all but the last area the evidence tends to qualify the relatively pessimistic assessments.

<sup>25</sup>Non-renewable resources are mainly minerals, including oil, as opposed to renewable resources like fisheries and forests.

<sup>26</sup>See NAS (1986), Barnett et al. (1984), Goeller and Zucker (1984), Leontief et al. (1983), MacKellar and Vining, Jr. (1987), and Slade (1987).

The first conclusion was based on the inability to obtain reasonably conclusive and robust empirical results relating to the impact of population growth and age structure on saving.<sup>27</sup> While the data and the modeling leave much to be desired, the failure to "confirm" the strongly-held priors relating to postulated adverse impacts of population growth on saving has diminished the emphasis on this particular linkage. The second conclusion is based on demonstrations with simple growth-theoretic empirical assessments using computable general equilibrium models; it is also illustrated by Kuznets' (1967) analysis of historical trends.<sup>28</sup>

The above two conclusions, which represent qualifications of the Coale-Hoover model (a primary analytical framework of traditionalism), helped to elevate revisionism in the 1980s. This shift in thinking was further reinforced by a qualification of the Coale-Hoover hypothesis relating to human capital accumulation.

Human capital accumulation. The concern that population growth will significantly shift resources from productive physical capital formation into alleged "less-productive" areas such as education was not sustained by the data. The financing of educational enrollments, which expanded significantly even in the face of population pressures, came from some combination of increases in public (sometimes deficit) spending, reductions in per pupil expenditures, and efficiency gains rather than reduction in investments in other areas. While this allocation plausibly reduced the quality of education, the quantitative importance of this impact was uncertain.

The limited number of studies exploring these issues, based on cross-country comparisons, tended to arrive at the same conclusions.<sup>29</sup>

One example is instructive. T. Paul Schultz' (1987) detailed

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<sup>27</sup>With respect to the age-dependency effect, the World Development Report concludes: "Recent empirical studies find only minor support for this view" (World Bank 1984, p. 82). Timothy King (1985) concurs: "In the litany of antinatalist argument, however, this one bears little weight. ...most modern theories suggest that the proportion of children in the population is not very important" (p. 4). Hammer's review of the empirical literature (1985) concludes: "While there is much evidence to indicate that these two aspects of development [population and saving] are intertwined in many ways, no simple generalizations are justified" (p. 3).

<sup>28</sup>Kelley and Williamson (1974), Keeley (1976), Srinivasan (1988).

<sup>29</sup>Bilsborrow (1978), Schultz (1987), Tait and Heller (1982), Simon and Pilarski (1979).

empirical analysis of schooling in 89 countries over the period 1968-1980 revealed that while the overall pace of human capital accumulation in the Third World was exceptional by historic and regional standards (there is, however, a reduction in per pupil expenditures), there did not appear to be a notable (or even measurable) diversion of resources toward education due to demographic factors. In particular, the relative size of the school-age cohort did not appear to exert an independent effect on the share of GNP allocated to education, other things equal, causing Schultz to observe: "This finding challenges the working assumption of Coale and Hoover (1958) that linked population growth to the share of income allocated by poor countries to 'less productive' expenditures on education and social welfare programs." (pp. 458-59)

Resource degradation. The concern about the effects of population growth on renewable resource degradation where property rights are difficult to assign or maintain (e.g., rain forests, fishing areas) was warranted.

It is important to recognize that this result, which tends to elevate population pessimism, is also revisionist in orientation, since it explicitly highlighted the role of feedbacks. In this case, however, the market- and political-feedbacks needed to attenuate excessive resource use were assessed to be weak. These feedbacks would likely remain weak in the intermediate future when substantial, and in some cases irreversible, resource degradation would take place.<sup>30</sup>

#### 4.22 Variables Versus Constraints

Uneasiness in the consensus regarding the merits of revisionism rested less on qualms about the above propositions than on two areas at the heart of revisionism: an assessment of 1) the empirical strength and speed of response of "feedbacks" (including institutions that are held to attenuate the initial impacts of population growth); and, related to this, 2) the extent to which institutions (e.g., public policy, land tenure systems, social norms) should be considered as "variables" (revisionism) as opposed to "constraints" (traditionalism) in the analysis of population.

Government Policies. In no area are the doubts about revisionism better illustrated than in a consideration of the role of the policy-making environment in the Third World. In particular, should public policies be taken as a "given" in the

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<sup>30</sup>National Research Council (1986, ch. 2), World Bank (1984), Keyfitz (1991a, 1991b).

analysis of population; or should they be considered a variable, possibly even responding to population pressures?

Government policies condition both the form and the size of population impacts on the economy, and these policies respond, in turn, to demographic change.<sup>31</sup> Unfortunately, very little can be said about how government policies relate to rapid population growth because a theory of government behavior that commands substantial empirical support is not available. Models have therefore tended to take the policy-making process to be exogenous (a constraint) in the analyses of demographic change. This approach is defensible so long as it does not downplay the important role of government policies as conditioning variables.

In many Third World countries, government policies have been incompatible with the promotion of economic growth in an environment of rapid population change. Consider three examples. First, policies toward the labor-intensive agricultural sector (especially in Africa) have taken the form of low investment in rural social overhead capital, high taxation of farm outputs (export taxes, and marketing boards that buy output at suppressed prices), high taxation of farm inputs, and exchange rates that encourage primary product imports and discourage exports. Such policies deter productivity-enhancing investments that counter the effects of diminishing returns in agriculture.

Second, inward-oriented international trade policies, including exchange rates that favor low-cost imports, have stimulated capital-intensive production in some industries with a corresponding underutilization of abundant supplies of labor. Finally, policies that favor the location of populations in urban areas have encouraged in-migration and city building that is both capital intensive and expensive.<sup>32</sup>

In general, those countries where government policies have encouraged production patterns at variance with comparative advantage by underutilizing labor have experienced greater costs and fewer benefits of population growth. Revisionists have drawn attention to these policymaking issues by observing that many of the adverse consequences attributed to rapid population growth (e.g., food shortages, urban squalor, unemployment) are largely the result of unsuitable government policies. A major impact of population growth has been to reveal the adverse consequences of such policies sooner and more dramatically. As such, while population growth "exacerbates" some problems, it may not be their most important cause. It therefore represents misplaced

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<sup>31</sup>This section draws on Kelley (1988, pp. 1717-18).

<sup>32</sup>Kelley (1991).

emphasis to confront such problems with population policies because without a change in economic policies, slower population growth simply postpones the day of reckoning, when the adverse consequences of ill-advised economic policies are tallied.

This is a reasonable set of propositions if the argument is one of redressing misplaced emphasis on population policies in those cases where population growth is relatively unimportant. However, one difficulty with the debates has been their tendency to polarize issues toward either-or choices. It is more appropriate to recognize that both population and economic policies exert independent as well as interacting effects on the economy, and that a combination of policy changes may be in order. Two recent statements on the need to develop a balanced perspective that considers population and economic policy interactions are instructive. On redressing possible misplaced emphasis on population policy for solving the short- to intermediate-run problem of starvation, Srinivasan (1987) observes:

The cause of eliminating starvation...will be ill-served if, instead of analyzing avoidable policy failure, policy makers turn their attention to attempts at changing an admittedly slow-acting process such as the interaction between population growth and the food economy. This is not to deny the modest improvements...resulting from an exogenous reduction in the rate of population growth; rather it is to point out that the pay-off to the correction of policy failures is likely to be more rapid and perhaps greater. (p. 25)

The World Bank (1984) generalizes this point with a stronger emphasis on population policy. It also highlights the need to distinguish between short- and long-run policy impacts.

...policies to reduce population growth can make an important contribution to development (especially in the long run), but their beneficial effects will be greatly diminished if they are not supported by the right macroeconomic and sectoral policies. At the same time, failure to address the population problem will itself reduce the set of macroeconomic and sectoral policies that are possible, and permanently foreclose some long-run development options. (p. 105)

At any rate, while it can be demonstrated that "population problems" are largely due to inappropriate government policies, it is also the case that, given these policies, population growth can exert a stronger adverse impact. Since much of the debate has focused on alleged "population problems," a consensus on

population's impact will depend critically on whether such government policies are taken as a constraint, or a variable in the analysis, and whether, even if a constraint, such policies are quantitatively important.

Agricultural Technology. The linkages between population growth and size, and labor productivity in agriculture, are particularly important because the substantial majority of the labor force in the Third World, especially in Africa, India, and China, still derives its living from the land. The theoretical relationships are straightforward but ambiguous. Diminishing returns to labor due to a limited supply of land can be offset all or in part by technical change and/or scale economies. As a result, the net impact of population can only be determined empirically. Since in most of the Third World a substantial expansion of land is not presently a viable or economical option, the key linkage pertains to the relationships between population growth and size, and land intensification.<sup>33</sup>

In terms of the empirical record, the picture is varied. For most of Asia, population pressures have encouraged the adoption of new agricultural technologies that are exceptionally productive by historical standards, although there are conspicuous examples where the new technologies have not taken hold.<sup>34</sup> Important lessons have been learned from an analysis of this varied experience. In particular, a major factor explaining variations in country-specific experience has been differences in

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<sup>33</sup>In Asia, where most of the Third World resides, land supplies are quite constrained. In Africa, where arable land is relatively and seemingly abundant, costs of reclamation are often high, and the soils are frequently low in nutrients and thus easily degraded. The implications of these soil assessments are uncertain. On the abundance of African land, Nikos Alexandratos' (1986) study of 38 countries concludes that "...a country's capacity to feed its growing population... depends only weakly on its land endowments per se..." (p. 19). Johnson (1984) is unequivocal on this point: "... there is not the slightest shred of evidence that continued poor performance of food and agriculture in most of Africa is in any way related to resource restraint" (p. 76). On the other hand, with respect to the cost of reclaiming African land, the World Bank (1982) concludes that much of the land is located in areas infested with insects carrying river blindness, sleeping sickness, and malaria. As a result, land intensification can still represent the most economical method of increasing agricultural output. A detailed analysis of the costs of reclaiming land in Africa and India is provided by Binswanger and Pingali (1984), Pingali and Binswanger (1984, 1986, 1987), and Ghatak and Ingersent (1984).

<sup>34</sup>For Asia, see Hayami and Ruttan (1985, 1987). For Africa, see Binswanger and Pingali (1984), Pingali and Binswanger (1984, 1986, 1987), and Ester Boserup (1965, 1981). Agroclimatic conditions in Africa are not as advantageous to known technologies: soils are deficient in key minerals; the hotter climate reduces the efficiency of fertilizer use; a higher clay content reduces water absorption capacity; and closer proximity to the sun results in reduced areas over which a given technology package is appropriate. These factors increase the cost of research and development, and the cost of inputs. Gourou (1980), and World Resources Institute for Environment and Development (1986).

institutions such as markets, land-tenure arrangements, and government policies. Hayami and Ruttan (1987) place particular emphasis on institutional factors:

The gains from the new technology can be fully realized only if land tenure, water management and credit institutions perform effectively. Markets for inputs that embody new technology--seeds, fertilizer, pesticides--must perform efficiently. Product markets in which prices are distorted against either producers or consumers fail to generate the potential gains from the new technology. (p. 94)

Clearly, a key to untangling the relationships between technology and demographic change is the impact of population pressures on institutions (e.g., land tenure arrangements, markets, government policies). Regrettably, no generalization is possible here. For example, Rosenzweig, Binswanger and McIntyre (1984) find that output, land, labor, and especially rural credit markets develop in response to higher population densities; and Robert Bates (1983), a political scientist, observes that "...population density promotes the formation of political systems by generating a demand for the vesting of property rights over scarce resources." (p. 35) In contrast, in some areas population pressures result not in land reform, but in land fragmentation.<sup>35</sup> And, with respect to government policies, often biased against technical change and investments in agriculture, a central question is whether governments are more or less likely to undertake appropriate agricultural policies in an environment of slow versus rapid population growth. Srinivasan's (1987) judgment encapsulates our present state of knowledge here:

...it is difficult to assess even qualitatively whether such change [in agricultural systems] will be orderly or whether the burdens of adjustment will be distributed in proportion to the capacity to bear them. ...it is difficult to say whether an easing of demographic pressures will merely postpone the day of political reckoning, or will provide an extended period during which institutions can respond positively. (p. 24)

Again, as was concluded above, the analysis of the impact of population growth depends on whether institutions are considered as "variables" or "constraints," and, if variables, the ways and speed with which institutions respond to population pressures.

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<sup>35</sup>For Bangladesh, see Arthur and McNicoll (1978). For a case study of two rural Indonesian villages with contrasting patterns of institutional change in response to rising population densities, see Hayami and Kikuchi (1981).

An assessment of these questions is critical since institutions strongly condition the response of technologies in agriculture--the dominant sector of production in the Third World, and technological change represents a (the?) key to Third World development in the coming decades. Badly needed to untangle these issues are stronger theories of institutional change, the considerable input of economic-historical studies in both formulating and testing such theories, and an incorporation of these results into formal modeling efforts (mainly computable general equilibrium models) to assess the role of population size and growth on development. No strong consensus on the population debate can be forthcoming until this occurs.

Bottom Line More than any factor, the strength and nature of "feedbacks" attenuating or overturning initial impacts of population growth represents a major remaining area of contention in the population debate.<sup>36</sup> Traditionalists tend to assume away these feedbacks away by considering only the very short run, by treating them as "constraints" in the analysis, or by hypothesizing that their impact is quantitatively unimportant. An example of this posture is the position of Nathan Keyfitz (1991c), a distinguished demographer, who, in commenting on "feedbacks" (denoted as intermediate variables), observes:

The range of these [intermediate variables] is limited only by the imagination of the writer, and the scope for cleverness is wide. Every one of the arguments can be supported by some anecdote, [and] for none is there convincing evidence. I submit that the direct effect is primary, and that the burden of proof is on the one who has introduced some intermediate effect that would upset it. (p. 3)

This statement reflects a strength of skepticism about the importance of feedbacks that causes Keyfitz to propose an empirical test that is unnecessarily constraining (i.e., a one-sided rejection test that implies exceptionally strong theoretical priors). The revisionist methodology does not, and sound science should not, require upsetting direct effects, but only an even-handed analysis that takes feedbacks into account. Keyfitz' statement also reflects the intensity of the debate, the continuing difficulty of achieving a consensus, and the exceptional importance that research in the future be focused on this central dimension of revisionism--the quantitative importance of feedbacks in a general equilibrium framework.

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<sup>36</sup>This assumes that the population debate will continue to focus on economic development and growth, as distinct from distributional issues or welfare.

## 5.0 1990s

The above review has been selective, focusing primarily on factors that account for the prominence of revisionism through the 1980s. The present section extends this analysis to the 1990s.

### 5.1 The Research Agenda

Four research themes have been emphasized. The first has been a reassessment of the macro "correlations" literature that attempts to identify, using cross-country data, statistical relationships between demographic change and the pace of economic growth. This research was motivated by several new studies showing a negative impact of population growth on per capita output growth for the 1980s--a result at variance with the influential findings for the 1960s and 1970s showing no, or at most, a weak relationship.<sup>37</sup> The second research theme has been a review and extension of the micro-economic/social studies exposing impacts of family size on household nutrition, health, and education. This research was motivated by an attempt to reconcile strongly-held priors that large families deter personal development with the economy-wide results showing rather weak relationships between educational participation, food availability, and population growth.

The third research theme has emphasized the impacts of population growth on the environment. This research was motivated both by an elevation of the goal of environmental preservation world-wide, and a realization that providing sufficient food for expanding populations will exact some environmental costs that need to be reckoned. A final research theme has refocused attention on the connections between population pressures and poverty.

### 5.2 Leading up to Cairo

Three studies, commissioned to provide background for the 1994 Cairo Population Conference, represent a convenient basis for summarizing the population research in the early 1990s.

World Bank. The first, sponsored by the World Bank and undertaken by Kelley and Schmidt (KS), replicated and confirmed the results of five earlier studies that showed a negative impact of population growth on per capita output growth in the 1980s.<sup>38</sup>

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<sup>37</sup>Barlow (1992), Blanchet (1991), Bloom and Freeman (1988), Brander and Dowrick (1994), and United Nations (1988).

<sup>38</sup>Kelley and Schmidt (1994, 1995).

In addition, KS extended the modeling in two directions, by 1) appending several demographic embellishments to the popular convergence, or technology-gap, paradigms (e.g. the Barro model); and 2) developing a dynamic model designed to expose the differential impacts of population over the life cycle (e.g., the negative impacts of children versus the positive impacts of working adults on per capita output growth).

This research confirmed the overall negative impact of population growth on per capita output growth in the 1980s across a large number of countries (DCs and LDCs) using a technology-gap model. It moreover revealed that the impact of population growth varied with the level of economic development: it was negative in the LDCs and positive in many DCs. An assessment of a net negative impact across all countries appeared in spite of the positive effects found both for population size and density. While no explanation was provided for the new results for the 1980s, the authors explored the hypothesis that the timing of demographic effects may have played a role. Since the economic-growth impacts of a new birth vary over a lifetime, modeling of demography should ideally account for the patterns of demographic changes, in particular births and deaths, over time. KS (1995) confirmed that some of the earlier "no-correlation" findings in the literature were related to these dynamics. This interpretation gained additional support from two technology-gap studies by Bloom and Williamson (1998) and Radelet, Sachs and Lee (1997), whose models emphasize age-distributional patterns.<sup>39</sup> All of these attempts at dynamic modeling are revisionist: all show that demographic change at a given point in time can have positive, negative, or neutral impacts on economic growth depending, in part, on the timing of the components of (positive) labor force versus (negative) dependent population growth. Only by accounting for this experience over several decades in a way that exposes a wide range of impacts can changes in fertility and mortality (and resulting changes in the age distribution) be adequately assessed.

ODC; Government of Australia. Two other studies leading up to Cairo can be considered together since their coverage and authorship have significant overlap. The findings of the first, sponsored by the Overseas Development Council and led by Robert Cassen (with 15 participants), appeared in Population and Development: Old Debates, New Conclusions; the findings of the second, commissioned by the Australian Government and led by Dennis Ahlburg (with 10 participants), appeared in The Impact of Population Growth on Well-being in Developing Countries.

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<sup>39</sup>BW emphasize demography and its implications, building upon the RSL core. RSL include a similar demographic specification (which is technically different from BW), and emphasize elements in the core model, as well.

Generally the results of these studies conform broadly with the collective findings of the several surveys examined above for the 1980s. This is hardly surprising since major new empirical findings were not forthcoming given the relatively short intervening period; and notable new interpretations are unlikely given the overlap of the participants with the earlier surveys. Neither of the two new studies is alarmist in tone; both are balanced in their consideration of both short- and long-run impacts of demography, a wide variety of impacts (both positive and negative), and various feedbacks.

The two studies did offer a modified reorientation of past analyses by shifting attention from the macroeconomic impacts of population growth to an elevated emphasis of the microeconomic impacts of large families. Specifically, it was found that large families were disadvantaged in health and nutrition. In addition, several studies revealed adverse impacts of large families on educational attainment and participation, although here the evidence is mixed, precluding strong conclusions. This is because there are a sizeable number of studies showing no, or even positive, impacts of family size and educational outcomes, and seldom are any of the (positive or negative) impacts quantitatively large.<sup>40</sup>

The resulting bottom lines of the two studies, together, are qualified and quite comprehensive. Cassen (1994) concludes:

"At the microeconomic level, ...there are clear negative effects [of large families] ...on the health and education of children and mother's health and life opportunities (p. 20). ...At the macroeconomic level, matters are less definitive; much depends on circumstances" (p. 20).

Ahlburg et al. (1996) conclude:

"...slowing of rapid population growth is likely to be advantageous for economic development, health, food availability, housing, poverty, the environment, and possibly education, especially in poor agrarian societies facing pressure on land and resources. For several of these areas, for example poverty, the size of any beneficial effects of slowing population growth is unknown. For other areas, the impacts are relatively small. Such small

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<sup>40</sup>While upwards 40 separate econometric studies using household data are assessed, the modeling and empirical analysis of most of these studies is problematic. The family-size decision is usually modeled as exogenous and, in all but three studies, the impacts are posited as being linear over the entire range of family size. As a result, this literature is presently quite unsettled, based both on its mixed results and its underlying modeling.

effects, however, are likely to be synergistic and cumulative" (p. 10).

## 6.0 Reconciliation

It is intriguing that the assessments on the economic consequences of population growth, as found in the seminal 1951 United Nation Report, have not much changed over the intervening five decades. While debates on these consequences have been vigorous and contentious, what we denote in this essay as "revisionism" has, for the most part, prevailed as the dominant analytical perspective amongst most economists who have written on population matters. The hallmark of this revisionism is not whether the net impact of population growth is assessed to be negative or positive. It is rather the way the analysis is undertaken: focusing on the longer run; accounting for feedbacks, direct and indirect effects; and admitting a wide range of impacts, both positive and negative. In a sense, this broader perspective has attenuated the rancor in the debates; it has provided a reconciliation among a number of participants to the debates that admits a middle ground that is plausibly closer to the truth, and arguably based on sounder scholarship.

The research agenda of revisionists is particularly demanding given the extended time period of analysis and the variety of forces that must be reckoned. Over the last half century this research has expanded at a reasonable pace, resulting in strong qualifications and a downgrading of several empirical propositions of the "traditionalist/alarmist" school. It has moreover exposed several areas where more research is needed (e.g., the impacts of rapid population growth on poverty, and the environment; the interactions of policy environments and demographic change).

While the bad news is that in many areas of population assessments, the empirical findings lack precision and strength, the good news is that debates have become less contentious and increasingly productive in outcome. While possibly the only certainty in the "population debate" may be its continuance, fortunately the elevation of the revisionist perspective has put that debate on a solid footing.

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