*Philippine Review of Economics and Business*
Volume XVII, Nos. 3 & 4, September & December 1980

# NOTES ON THEORIES OF ECONOMIC GROWTH

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It may be useful to look back at the theories of economic growth that dominated the first century in the development of our discipline — from the last quarter of the eighteenth to the last quarter of the nineteenth centuries. By theories I mean analytical structures that claim to explain the economic growth of nations, and account for the process so as to yield testable prognoses of the course the process is likely to take.

The Classical doctrines, as they developed from Adam Smith's *Wealth of Nations* (1776), which could just as well have been called Economic Growth of Nations, through Malthus and Ricardo, to the summary in John Stuart Mill's *Principles of Political Economy* (1848), were one such body of theories in which the analytical structure accounting for growth led to the prediction of an imminent stationary state, and of specific trends in the distribution of the national product among landlords, capitalists, and workers; and had a variety of bearings on the advantages of intra-national and international division of labor, and hence on policies relating to these fields. The Marxian doctrines, as they were adumbrated in the *Communist Manifesto* (1848) and elaborated in *Das Kapital* (first volume in 1867) were another such body of theories of growth, within a wider framework of the economic interpretation or materialist conception of history; and again led to specific prognoses concerning the accumulation of capital, the declining rate of exploitation and of profits, and the widening inequality between the high incomes of a diminishing group of capitalists at the top and the increasing "immiseration" of the growing body of proletarians at the bottom (with eventually no middle class). And the doctrine has

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clearly exercised enormous influence as the basis for revolutionary and reformist movements intended to facilitate the eventual transition from industrial capitalism to the socialist or communist state.

We neglect here the partial reactions to the Classical doctrines that emerged within some follower countries (that lagged behind the pioneering England) — the Pennsylvania school in the United States (in Philadelphia, in the 1830s) and Friedrich List's *National System* (of the 1840s); and the wider coverage of the Historical School (largely in Germany) extending from the mid-nineteenth century to World War I. Neither yielded an analytically complete theoretical structure that would lay the basis for deriving patterns of movement of growth processes over time — except for the variety of "stage" theories, which were largely and broadly descriptive and had limited predictive application. This is not to deny the value of the corrective criticism and caution that these reactions to the Classical (and Marxian) doctrines introduced; nor the influence in modifying policies (e.g. through the protective tariffs and infant industry arguments; and recognition of the importance of the unifying and conditioning influence of the sovereign stage) that proved important in the adjustment of follower countries to the potentialities of modern economic growth. But we concentrate here on the Classical and Marxian schools.

As we look back at the development and predictions of these two bodies of doctrines, five major observations seem appropriate. First, there has been a rather consistent failure of the predictions derived from these theories. Second, despite such failures, the theories are found, upon examination, to reflect a substantial body of observed experience. Third, the trouble appears to lie in this body of experience either being too narrow — particularly in excluding relatively new elements in the growth situation; or in underestimating the weight of some of the old elements not easily includable in economic analysis. Fourth, even given the failure of their predictions and the corresponding dangers of wrong policies, the theories served useful purpose as bases for effective policy adjustments or important social movements. Fifth, the theories demonstrated a great capacity to survive, despite the failures of prediction in the past, and influenced analysis and measurement even in recent decades; this must be recognized in any current discussion of limitations and problems in the current measurement and analysis of the economic growth of nations. Brief comments on these observations follow.

The failures of the trend predictions of both schools became common knowledge, however resisted by political partisans, by late

nineteenth century; but it should help to indicate them briefly here. The Classical school's theory, with its basic assumption of the inexorable "laws of production" (Mill's term), meaning largely diminishing returns from the increasingly scarce supply of non-reproducible natural resources (mainly land), led to the inevitability of the stationary state, considered imminent by John Stuart Mill in 1848. Even more important, the approach to this state was via increasing share in national product of rent (flowing to improvident landlords) at the expense of the decreasing share of capitalists' profits (the only source of savings and of capital accumulation), with the Iron Law of Wages holding the returns of labor at subsistence levels. The forecast was thus for a higher share of rent, eventual exhaustion of profits and cessation of capital accumulation, with the pressure of population growth maintaining the Iron Law of Wages — and eventual stagnation. But it became clear by the 1880s and 1890s that growth continued on a per capita basis, as vigorously or more vigorously than before (even in England) with no stagnation in sight; that the share of rent in national product failed to rise, and perhaps declined; and that the growth of population was slowing down, despite the Malthusian law of population growth, as formulated in the first edition of his *Essay* and as embodied in the corpus of Classical theory.

A similar failure characterized the predictions of the Marxian school. While the scale of production plants and firms did increase, it was obviously due to requirements of the new technology — more so than to any competitive pressure among capitalists associated with the declining rate of profits. There was no "immiseration" of the proletariat, and no widening contrast between the rising incomes of a numerically diminishing group of capitalists at the top and the declining or stagnant incomes of the proportionately growing proletariat at the bottom. And there was an increase rather than a decrease in the proportions of middle classes, even though they ceased to be petty producers and traders and became white collar workers of widely differing professional and occupational status. Nor was there, in the developed countries, where it could be expected, any increase in the severity of class struggle or of frequency and severity of economic crises.

And yet, to turn to the second observations, the two sets of theories embodied and reflected a great deal of historical experience. The emphasis of the Classical doctrine on the source of growth in the increased skill of labor, due to wider division and specialization of large volumes of labor working for a wider market and backed by increased capital (via the wage fund theory), was surely realistic in

reflecting the historical experience in the pre-modern past — in the effects of the freedom of the cities and expansion of the markets in the late Middle Ages and the centuries of merchant capitalism. Likewise, the emphasis on the tendency of population to outrun the supply of food reflects wide experience with crop failures, famines, and mortality in the pre-modern centuries, and is a general reflection of the need for what we now call the ecological balance and attention to the constraints of natural resources — which in a different application are the topic of much discussion today. Clearly, the Classical theories reflected, even if in an uneven fashion, a vast body of historical experience with economic growth and economic adjustments.

The same could certainly be repeated for the Marxian school — not only in the absorption within its framework of a vast amount of historical and anthropological knowledge, but in the use of a large stock of specific data, qualitative and quantitative, relating to the early phases of industrial capitalism in England. Friedrich Engels' *Conditions of Working Classes in England* (1845) is commonly considered a precursor and stimulus of Marx's *Das Kapital;* and both are based on intensive utilization of Parliamentary blue books and commission investigations relating to the problems generated by the emergence and early growth of industrial capitalism. While it would require a detailed and prolonged study of the writings, references, etc. to establish clearly what particular body of historical experience was reflected in what particular body of data used by the creators of theories to justify the formulations that they advanced, one may reasonably and defensibly argue that there was a substantial empirical foundation in both the Classical and Marxian doctrines. If the analysis and predictions proved wrong, it was due not to the lack of, but to some major limitations in, the body of historical experience considered and the weight assigned to its various relevant components.

As we turn now to our third observation, the omission or mis-weighting of empirical evidence in deriving the Classical and Marxian theories, one should admit at the outset that only broad, tentative statements, are possible here. Yet such tentative statements are useful, for they may indicate, for reasons given below, the directions in which analysis of economic growth has to be furthered now. Two broad omissions and mis-weightings may be suggested. One was the obvious underestimation of the weight and contribution of technological innovations to modern economic growth, to the point of omitting technology as an adequate countervailant to constraints imposed by non-reproducible natural resources. The second was the equally obvious mis-weighting of a variety of factors other than strictly eco

nomic, on the human, political, and ideological side, that are of major importance in understanding the changing conditions and the international spread of modern economic growth.

The gross underestimation of the power of additions to the stock of useful knowledge and technological innovations — in both the Classical and Marxian schools — is, at first, puzzling; and, considering the associations and intellectual inclinations of the leaders of these two schools, may seem ironic. Here was Adam Smith, a contemporary and neighbor of Joseph Black, the famous scientist at Glasgow University, who advanced the theory of latent heat (of importance in the development of what eventually became thermodynamics) and of James Watt, the laboratory mechanic at the same university, and the inventive genius who was responsible for the first efficient, true, steam engine. And yet, Smith emphasizes the productivity-increasing effects of division of labor, not of scientific discoveries or of science-based technology and technological innovations. Here was John Stuart Mill, writing in 1848, seventeen years after the opening of the first all-steam railway in England (and in the world), and emphasizing the inexorability of the laws of production — despite the increasing evidence that *production* as distinct from *nature* is a human activity and unlike laws of nature, subject to change, as human knowledge and the capacity to apply it, change. Here was Karl Marx, with his emphasis on production relations as the base determining social and economic structure and interests, failing to understand the productive relations that technological innovations would generate in the development of modern industrial capitalism. And yet the broad notions as to the power of empirically founded science to provide a cornucopia of economic and other goods go back at least to Roger Bacon in the thirteenth century; have been emphasized in the setting up of academies and scientific societies in the seventeenth century; and underlay government policies in several European countries in establishing and fostering technological institutes and science-oriented universities, clearly by mid-nineteenth century.

Still, further examination and reflection indicate that the puzzle is not as great as it seems. To begin with, many of the major modern technological innovations were in their early stages; and it was difficult to foresee the full consequences of iron and steam until the late nineteenth century, given the lag of reliable records after the events. Even the early scientists and technologists (and the later also) underestimated the full consequences of the discoveries and inventions which they themselves introduced. Second, in a scholarly attempt to obtain the right balance, it seemed always safer, and more responsi-

ble, to rely on the hard evidence relating to the past than on the uncertain evidence in the present or the guesswork, no matter how prescient, about the future. And much of the past accessible to eighteenth and nineteenth century scholars, prior to about a century ago, suggested only a slow and intermittent triumph of human knowledge over the problems of economic and material welfare. After all, there was serious discussion in the eighteenth century as to whether the level of material life, and even numbers, among the moderns in Europe were as great, or lower than, these numbers and levels in the "Golden" ages of the antique world.

Finally, in dealing with the policy problems involved in the growth of nations, it was damaging to include an open variable such as additions to knowledge and technological change, with no apparent limits to it. For the closed systems of both the Classical and Marxian schools with the diminishing returns or declining rate of exploitation and profit bringing about a closure, would be burst wide open by any assertion that changes of unlimited and hence in the long run unrestricted character could be provided by additions to knowledge; and leave the open system without any clear answers as to trends or constraints. There was thus a natural bias against admitting technological innovations as a significant and open variable, *a la* the science-fiction phantasies of the nineteenth and twentieth centuries. It was no accident that Classical economics, and to a lesser extent, Marxian economics, were dismal, rather than foolishly optimistic, sciences. The problem of handling a variable like technological innovations persists today; and is not resolved by calculations of unexplained productivity residuals or *ad hoc* shifts of some consumer expenditures to investment in human capital. One can thus easily understand why technological innovations were downgraded in both Classical and Marxian theories; and why when the projected trends proved invalid, orthodox economics limited its concern to short-term problems with fixed technology and tastes, thus extruding discussion of economic growth from the corpus of the discipline; while in Marxian economics, the experience led to various revisions and adjustments, in attempts to preserve the revolutionary or reformist impulse of the underlying doctrine.

The second major mis-weighting and neglect had to do with what might be called social antecedents and concomitants of economic growth — which may have lives of their own, and shape, rather than are shaped by, economic growth. A conspicuous illustration is the neglect in both Classical and Marxian theories of the significance of the organization of the world in sovereign, national states, with the importance of these units and nationalism rising in

the course of modern economic growth. Like a true product of the eighteenth century enlightenment, Classical economics tended to view the citizens of the world as economic men, seeking comparative advantages in free international trade or free internal trade — at least as an ideal view, that would be realistic, provided the minimum conditions for such freedom were set by governments. And Marxian economics modified this view only to the extent of recognizing class divisions, but still claiming the international validity of such class divisions — with capitalists and proletarians of the world pursuing each their interests without any complication by national division. Yet the role of nationalism in establishing consensus within a country, needed for channeling rapid modern economic growth without disrupting society's unity, was completely overlooked; and it was the service of the "national system" and of the historical school to emphasize these neglected important constituents in the theory of economic growth of *nations*.

Furthermore, the underestimation of the weight and power of technological innovations removed the need for considering the social and ideological adjustments to the new technology, which imposed constraints of its own on the way people lived, how and where they worked, and what kind of views on the relation between man and man, and man and nature, they could entertain that would be consistent with what scientific discoveries and technological innovations indicated. Finally, one must recognize that knowledge concerning the long-term operation and institutions of even the Western societies was quite limited until late in the nineteenth century; and that concerning the large part of the world outside of Western Europe and its immediate offshoots overseas, was even scantier — and is quite limited even today. Only the modern transport and communication technology allowed the developed countries to get in touch — if that be the right expression for often aggressive action — communicate with, and learn about, the rest of the world with its long and largely unknown history in Asia, Africa, and the Western Hemisphere. The variety of social and ideological conditionings of several modes of economic performance and growth was thus largely unknown. It was almost inevitable that, in generalizing about human economic behavior in the rest of the world, the Europe-originated theory would pattern the formulations on, to use the Weberian term, the ideal type of an economic agent envisaged in terms of either the Enlightenment, or of its modification by the introduction of the concept of class interests and class struggles. The consequent lack of caution in modifying the implications of the closed system, even unconditioned by effective technological innovation, with the possibility of various social and

ideological adaptations — including modification of demographic patterns away from the rigid Malthusian formulation — was perhaps to be expected; but it clearly contributed not only to the wrong projections, but to a curiosity-inhibiting sterility, a rigidity not permitting inclusion of additional variables of interest into the system proper.

Nevertheless, to turn to our fourth observation, the theories performed what, in retrospect, were socially useful functions — although one naturally hesitates to strike a clear balance of pluses and minuses (and the balance would probably differ at different phases in the spread of the theory and in its impact on policy, directly or indirectly, via the shaping of public opinion). The Classical doctrine has clearly contributed greatly to modifying the traditional restrictive policies and institutions, and freeing the growing economies of England and later of the continent from the impediments that premodern laws and institutions would have been to modern economic growth. Its most conspicuous application was in connection with the decision to repeal the Corn Laws (1846) and the implicit decision to let England become the workshop of the world, relying on free international trade to assure its food supplies. And however we may estimate the general value of freer markets, freer choice of occupations, freer international trade, it is clear that at that historical juncture, when European states were burdened by accumulation of various institutional and legal restrictions, that value was high. It must, of course, be offset by other applications of the doctrine, which hindered action to help labor displaced by technological innovations, reduced welfare activities of the state, and impeded the organization of labor and other groups to defend their interests.

Likewise, there is little question that the Marxian doctrines made a positive contribution in calling attention to economic inequalities, the prevalence and power of class interests, and the changing relations of power among them. They thus provided a stimulus for organization, and particularly for the protection of the economic interests of the growing numbers of wage earners who, individually, found themselves helpless against the economic power of the large firms. And there again we have to balance this contribution against the deformation of the movement into dictatorially organized revolutionary parties that boded little good for the kind of society that they were likely to shape.

Whatever the balance, the main point of the fourth observation is that despite the uneven empirical bases and the invalid predictions of the two groups of theories, they exercised important influences

in shaping modern economic societies — largely assisting their evolution in the process of modern economic growth, partly creating impediments and restrictive biases in their wake. The corollary of this observation is the vitality of the theories, their wide spread and persistence — partly a condition of their influence, partly a consequence of it. If, having been perceived as a correct policy prescribing doctrine, a theory was enthusiastically adopted, particularly by those who stood most to gain from the policy prescribed, it was bound to be spread, maintained, and defended against any weakening modifications — even if dispassionate examination might suggest such modifications. And the reaction of dissent was then likely to be not partial acceptance and modification, but radical disagreement — a denial of the whole doctrine, including often its valid parts. One interesting illustration is provided by the Malthusian law of population growth. Its rigid formulation in the first edition of the Essay (1798), which excluded preventive checks and therefore allowed no modification of demographic patterns by custom or education, was, in fact, rejected by Malthus himself who in the subsequent editions (growing increasingly in bulk) surveys a great deal of empirical evidence revealing a wide variety of fertility patterns, and stresses the importance and possible contribution of preventive checks. Yet the implicit conclusion, viz. that demographic patterns can be affected by policy and social development to remove the pressure of population on land, was consistently neglected in the spread of the Classical doctrine. In short, the doctrines proved to be long-lived and tended to survive in their starkest outlines; with the disagreements taking on the form of non-absorbable dissent, or benign neglect in favor of sets of problems different from those involved in economic growth.

We come now to our final observation, which may suggest the relevance of the preceding discussion to problems in the analysis of economic growth today. Both sets of theories, particularly the Classical, have continued to affect our current measurement and thinking by providing the simple and basic definitions and relations for our views of the aggregate processes of production, productive resources, output, pricing, and allocation — even if supplemented by the yield of the marginal revolution of the second half of the nineteenth century. When, after a long hiatus extending over three quarters of a century, interest in economic growth of nations revived, largely after World War II; when, for a variety of reasons, the increased emphasis on problems of aggregate growth, and the development of basic statistics and statistical tools, led to an explosive accumulation of aggregative measures (most, but not all, contained in national economic accounts), the underlying concepts and implicit theories of production, resources pricing etc. were those found in Classical

economics — with only minor modifications. Indeed, the national income concepts used today do not differ much from those used by Gregory King at the end of the eighteenth century; and what is more important, the analytical assumptions as to what constitutes production factors and what constitutes output are not too different from those of the Classical doctrine (and differ in relatively minor respect from the Marxian).

This can easily be illustrated by a glance at our conventional national economic measures, which are used so widely in measurement of economic growth; and in econometric analysis related to the latter. Production factors are limited to labor, valued at the payment to it (including labor returns to self-employed workers or entrepreneurs); and capital, both reproducible and natural resources (in form of various property incomes, including rent). But expenditures on education are not treated as capital inputs; they are classified under consumption, and thus implicitly are assumed not to contribute to product. Government outlays on commodities and services are all treated as finished product, although clearly a part of it is maintenance of the operating fabric of society (justice, legislation, regulation, police, and defense) — and hence are costs of maintaining operation of society, not final product. Output usually covers the marketed total, plus some product retained by producers for own consumption (say food on farm); but either positive or negative by-products, associated with output, are not included (e.g. pollution through the use of cars). The implications of some of the illustrations may be debated; what is unquestionable is that our current measures of economic growth, and of various components in it, are quantitative counterparts of a system of definitions (concepts) and relations that represent a theoretical structure; and that structure is very much the Classical one — with the implicit neglect of the technological and other factors that were suggested above.

The comments above also serve to explain much of the current criticism of the measures of economic growth, and of the current emphasis on some of the negative externalities of growth — not reflected in the current measures. The criticism is clearly unbalanced — for it neglects the omission from conventional measures of economic growth not only of negative or undesirable by-products and costs but also of positive by-products and consequences (e.g. increased leisure, a wider diversity of goods not reflected in simple quantitative measures, better control over disease and mortality, and the like). And yet the criticism is a natural reaction to measurement and analysis that are based on an oversimplified theory of production and growth, which neglects the major role of technological innova

tions and of the complementary and offsetting adjustments which their introduction generates in conditions of life and work of the members of the growing economies. This is not to deny the great value of much of what was learned from the application of the conventional measures to the growth experience of the developed countries, and to some extent to the economic performance of the less developed countries. Without such learning, even the rough orders of magnitude and the outline would not be available. But in the process we have also learned of the gaps in our analysis — some by the derivation of unaccounted-for residuals in the measures of total factor productivity, some by the observation of changes in conditions of work and life not reflected in the measures, some by the difficulties of applying conventional concepts and analysis generated within a framework of the developed economies to the variety of different social and economic structures among the populous, less developed countries of the world.

Much of the present state of knowledge and discussion in the measurement and analysis of economic growth of nations is thus a result of a revival of active interest in it after a long period in which work in this field has been neglected; and of the natural application in this measurement and analysis of concepts that have been long established in the orthodox (or Marxian) corpus of economic theory bearing on growth — a product essentially of the first hundred years in the history of our discipline. Perhaps the time has come to reappraise the results; to consider how to deal more effectively with the contribution and process of technological innovation, and with the social and ideological adjustments to them; to explore ways to take account of positive and negative externalities of growth, now not accounted for; and, not least, to reconsider the concepts and classifications so that, while retaining necessary comparability with those for developed countries, they would be more suitable for revealing the basic components and sectors in the measurement of economic performance and growth in the less developed countries. This is a big agenda, to which the present explorations of the role of education, or of the extra costs and returns estimated on *ad hoc* basis, have already made a partial contribution. But without neglecting what we have already learned, and applying the results as best we can, we have to recognize how much more is to be done, and how limited, in several important respects, our present findings and analysis are.