

Income Distribution and Water Resource Projects: Testing the Classical Theory of Economic Development

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The major defect of the data on which economists must rely—data generated by experience rather than deliberately contrived experiment—is the small range of variation they encompass.

—Milton Friedman

I

Large-scale water resource projects offer social scientists special opportunities, since by their very nature they do turn out something of a controlled social experiment. Into a region where life has proceeded smoothly and continuously for some time, a sudden flow of construction activity is infused, one which will ultimately change the sales and purchase opportunities open to residents for some time to come.

I suggest in this paper that such projects offer excellent prospects for learning more about the benefits and costs of industrial growth, especially about who benefits from such growth and who bears the costs and how the benefits and costs affect attitudes toward the project which brings change.

II

Classical ideas about economic growth and its effect upon social classes were based upon consideration of a society closed in the sense that the only source of additional resources for internal use was production within the society itself. The classical economists—Ricardo and his immediate followers—emphasized this view mainly because they wanted to expound upon a very important idea: that even such a closed society could effectively expand its resource base by (1) more efficient use of its own resources—switching away from traditional value systems toward more reliance upon market-generated values—and (2) what in effect amounted to use of other societies' resources through foreign trade. Underpinning the classical exposition lay a profound principle (which the classical writers never stated very well): that exchange with others is means of producing an item like any other and often cheaper than any other. If a society's resource base yields it what textbooks call a "comparative advantage" in the production of some set of goods, it can produce other goods more cheaply by specializing (to some extent) and relying upon exchange with other societies to produce other goods. This is the basic principle of resource allocation within or between societies; much of modern economics amounts simply to generalizing it.

Principles of efficient resource allocation are the same regardless of how many or what resources there happen to be or who owns them. But, when we consider the production of resources themselves, which is the basis of economic growth, the ownership arrangements of the society become important, since ownership arrangements determine much of the motivation for resource expansion. The classical writers thought in terms of

three groups of resources:

(1) "Land" could not be produced at all. With its ultimate fixity all societies were viewed as eventually having to cope; classical ideas on resource allocation could only make the coping more distant.

(2) "Labor" could be produced, given sufficient time, at a fixed cost per unit (the "subsistence wage") and would in fact expand so long as the actual wage exceeded the cost of production.

(3) "Capital," the primary engine of all growth, could also be produced at a fixed cost per unit (not given any special name) and would expand so long as its profitability exceeded this cost.

I believe the classical writers' inclination for this classification scheme was grounded not so much in their believing the items classified to have much in common as in the belief that the owners of the items had a good deal in common. Landowners were viewed as vestiges of traditionalistic nobility, which they were to some extent, capitalists as owners of the buildings and machinery from which the industrial revolution was being forged, and laborers as "have nots," owning essentially nothing. (The classical writers weren't passionate about the social classes implicit in their resource classification scheme; it took Marx to convert what they found analytically convenient into a passion.)

Given the classical setup, however, with one class getting a living by selling resources in very inelastic supply and two others depending upon resources in very elastic supply, it doesn't take much to deduce where society is ultimately going: to what came to be called the "stationary state." Economic growth will proceed so long as there is motivation for laborers to breed (indeed, so long as there is the possibility for more of them to survive and for capitalists to build more capital. But the famous law of diminishing returns puts a limit on this motivation by guaranteeing that rising land rents, as the fixed amount of land available is used more intensively, will bleed off more and more of the product, eventually reduce the earnings of labor and capital to their supply prices, and remove all motivation for further expansion. It doesn't take very much to figure out which class is going to get the best living in the long run either. Land will be the only resource returning anything to its owners above its cost of production: the ultimate beneficiaries of economic and industrial expansion will be the landowners.

Of course, this could all take quite a while in a closed society. And knowing where a society is ultimately going says little about how it's going to get there and what's going to happen on the way. The trip might not be all that dismal, and even the stationary state might not be all that bad, especially if laborers up their ideas of how much a subsistence wage is, a possibility Ricardo himself certainly considered. But a stationary state *is* stationary; industrial expansion does have its limit in the classical view.

But things certainly haven't turned out this way in western society so far, nor do they show any sign of doing so soon. A good question is why not? One obvious possibility is that, in a closed society, the supply elasticities of the different resources aren't what the classical writers thought they were. Oddly, perhaps, the classical writers never really considered trade between societies (or other groups) in resources themselves, rather than the products of those resources. Oddly, because in such a situation the classical suppositions about supply elasticities would seem more likely to hold, even in a short period of time.

III

Let us call a small part of a society trading with the larger society in resources and products of those resources a "region," and consider the results of applying classical ideas to such a region. Two things are usually special about a region as opposed to a national state of which a region is a part:

(1) Regions seldom have their own monetary unit. (There are exceptions, such as Scotland, but they are formal exceptions only.) In effect, this means that exchange rates are fixed between regions; all trade "imbalances" must be resolved somehow other than by exchange appreciation or depreciation.

(2) Migration of geographically mobile resources (labor and capital) is bound only by information and moving costs, which are likely to be smaller than between national states.

The first special characteristic of a region is of considerable interest in some contexts, but for present purposes the second is more important. Suppose an event occurs which motivates increased industrialization in Region A by raising the productivity of capital and labor in that region. This event would enhance the comparative advantage of Region A in some goods, but it would also raise the wage and profitability of capital in Region A relative to other regions. If interregional mobility of labor and capital were considerable, the classical ideas on economic growth would seem applicable with a vengeance. The result of such a productivity-enhancing event would seem mainly an expansion of the resource "size" of the region. More labor and capital would flow in until wage and profitability differentials were eradicated by more intensive use of resources specific to the region ("land"). Only the owners of these latter resources would ultimately benefit.

The types of events this conference is concerned with—water resource projects—seem likely candidates as this type of event. A large project, such as the Tenn-Tom waterway, is sold partly on the basis of its productivity enhancement features which will, supposedly, spur industrial growth in the area, essentially by lowering transportation costs to and from producing units located there. If this claim is true, who will benefit? Classical predictions would be that the main beneficiaries will be landowners. Laborers will receive no higher wage but will simply be more numerous. Business owners will earn no higher profit. Indeed, if the law of diminishing returns limited firms' sizes before (as it is supposed to in the textbooks), it still will, and the main effect of the event will be to have a greater number of essentially the same types of firms (two MacDonalds; maybe even a Burger Chef).

A lot of industrialization does seem to result in these sorts of results, but if this is the whole picture, I am puzzled by what the group attitudes toward the Tenn-Tom seem to be. My casual impression (which is a cheap and very inferior substitute for careful data collection) is that groups favoring strongly the project include strong contingents of what the classical writers would have called capitalists (businessmen generally) and laborers, while groups showing lukewarm support or even mild opposition include a strong contingent of landowners. If this casual impression is correct (and it may well not be), it suggests that the social classes don't know what's good for them or choose

not to do it (always a dangerous supposition) or that the classical analysis is somehow wrong even in this favorable case of application. How the classical analysis might be wrong is of considerable general interest.

One possibility is one that I've already mentioned: the classical writers tended to slight time in their analysis. An important innovation of neoclassical economics was the short- vs long-run period distinction. The basic idea of the distinction is simple enough: a change in circumstances can be expected to produce more supply response the longer the change is expected to persist. In the case of Tenn-Tom, businessmen and laborers will expect two types of demand increase as a result of the project: (1) a short-run increase for the duration of the construction of the project itself; (2) a long-run increase resulting from lowered transportation cost to and from the region. Classical ideas center mostly on the latter and emphasize the pulling of more resources to the region over the advantage of resources already there. However, the short-run effect cannot be ignored as a motivator of attitude, temporary though it might be. Given that the eventual gains from industrialization will spread throughout the whole society as capital and labor movement equalize net returns between regions, short-run gains might be captured largely by those who own resources within the region. Long-run considerations, which might lead even locals to favor placement of social infrastructure where it will do the society most good, might be swamped by the value of short-run local gains.

Then there is the whole matter of what economists call "externalities" and most call "environmental" effects. If the classical ideas do hold in the long run, laborers will end up with longer commuting distances, for which they will have to be compensated to induce them to commute, but everyone will end up breathing, eating, and drinking things they didn't intend to. Landowners, especially of unluckily placed land, may end up bearing a lot of these costs.

Of course, as I've said, casual impressions of what people think often turn out incorrect, and the first order of business should be to clear this up. A straight-forward, although moderately expensive, approach would be essentially to ask people in the Tenn-Tom region what they think with an appropriate questionnaire and attempt to correlate what they think with their socio-economic status. As a byproduct of such a study, information on the reasons for support or opposition might yield valuable information on the pecuniary value of environmental impacts. In view of the heavy weight currently given to such effects, hard information on these values would seem certainly worthwhile.

IV

Suppose it turns out that the short-vs-long-run distinction or external effects don't help us to understand attitudes? This would suggest that more substantial revision of the classical growth model may be in order.

What I feel might yield results is an idea of Ricardo's predecessor, Adam Smith: that "division of labor is limited by the extent of the market." (See Stigler on this point; also Eatherly 1978.) The essential content of this idea is that production cost per unit will be lower the greater the quantity produced per period of time, which, of course, will be greater the greater the quantity demanded.

By "division of labor," I mean (and I think Smith meant) two closely related phenomena. To explain these, I, like Smith, will use the example of a manufacturing firm (Ricardo, interestingly, used farming examples mostly) and the make vs. buy decision. Suppose that, over the range of output in a region, the assembly or manufacture of some subcomponent is subject to increasing returns to scale; the more done, the lower the cost per unit. This might be true for a number of reasons. Laborers might "learn by doing," or save time by not switching from one job to another, or

someone might find a way to mechanize the operation as it becomes more routine (Smith discussed all of these). In any case, if this item is bought, its price cannot equal its marginal cost of production, since that is less than average cost, which must be covered for a firm to be willing to sell. Firms which choose to make the item internally will have a better idea of the marginal cost of their own product than firms which buy it. However, as production in the region expands, the market for this item may grow large enough for increasing returns to be replaced by the law of diminishing returns, marginal costs may finally rise above average cost, and purchase of the item may become more attractive. Market expansion, then, may encourage "spin offs" of subprocesses and new business opportunities may emerge.

Even if "spin offs" do not occur, production costs will fall with market expansion if these types of processes are sufficiently important. Falling production costs are another way of saying increasing labor and capital productivity. Growth itself may be productivity-enhancing. Although it has never been fully worked out, Smith's notion of industrial organization is quite in opposition to the Ricardian notion which dominates the textbooks. In the textbook treatment, the size of a firm is limited by rising marginal costs which eventually make additional expansion unprofitable. In addition, the number of firms in the industry is viewed as growing until each firm minimizes its cost of production per unit.

Suppose that an industry is in such a state of equilibrium and transportation cost of the industry's output declines (perhaps because of the completion of Tenn-Tom or some other large-scale provision of infrastructure). Each firm will experience a higher sales price (at the point of production) and will be motivated to expand output. However, this implies an increase in the profitability of the firms, which will attract new firms to the industry (and the region). As industry output expands with a fixed number of firms, the firms earn more profit. But if other firms can assemble the inputs required to enter this market, they will do so. The increased profitability means that the agglomeration of inputs required to produce the output of a firm costs less than the sales value of the resulting product. Capital and labor migration will eradicate this extraordinary profit. The ultimate result will simply be a larger number of firms, each producing about the same output rate as before the transportation cost decline.

The fundamental idea which leads to this result is that the size of a firm is limited by the law of diminishing returns, not by the size of the market. Division of labor is self-limiting because it eventually gives way to falling productivity and rising costs. My interpretation of Smith (Eatherly 1978) is that this idea is inadequate for dealing with industries in which transportation cost is a significant part of delivered price to the buyer. Indeed, it is less than clear that competition in such an industry would lead to socially appropriate actions by the firms, since the competition would not fit the neoclassical ideas very well. The problem is that a trade-off exists between transportation and production costs in

such a situation, and it is not clear how a competitive market would handle this trade off. The type of competition which would emerge in such a situation is a form of monopolistic competition under which firms are limited in size by their markets. I have called such industries "Smithian," and have opposed them to "Ricardian" industries which dominate conventional treatments and in which division of labor is self-limiting.

What happens in a Smithian industry when transportation costs fall (the "extent of the market" expands)? As might be expected, under fairly general conditions, division of labor is more fully exploited as buyers order from further (and travel to buy further). Indeed, market expansion may result in fewer, larger firms, which may, in a sense, be more "profitable."

Another promising direction for research is on the question of labor migration. I have been speaking as if wage differentials between regions induce a one-way flow from low to high. Back in the days of "net migration" data, it wasn't too hard to talk like this with some confidence. But we know now that the migration picture is more complex. Wrighton and I (1974) found that Mississippi migration is two-way with a vengeance. Something like a tenth of the 1965 population were living elsewhere in 1970. But something like a tenth of the 1970 population were living somewhere else in 1965. Moreover, immigrants not only matched outmigrants in numbers but in educational skills and occupational levels (both of which were high). This entire area needs much more detailed investigation.

I have intended for this paper to be more suggestive than definitive, and I feel sure it is (at most). Mainly I wish to suggest the special opportunities open to social investigators as large-scale water resource projects are undertaken, not so much from the point of view of improving professional incomes through justifying or arguing against such projects as from the point of view of improving the state of knowledge of the effects of industrialization, with which we all must live.

REFERENCES

1. Billy J. Eatherly, "Smithian and Ricardian Production Processes: Transportation Costs and Market Efficiency Under Free Enterprise," (December 1978), unpublished.
2. ——— and Fred M. Wrighton, "Mississippi Migration, 1965-70: Facts, Theories, and Public Policies," Mississippi State University Social Science Research Center Report 44, Mississippi State, MS (October 1974).
3. Milton Friedman, "Price, Income, and Monetary Changes in Three Wartime Periods," *American Economic Review*, vol. 42, no. 2 (May 1952).
4. George Stigler, "The Successes and Failures of Professor Smith," *Journal of Political Economy*, vol. 84, no. 6 (December 1976).