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ECONOMIC PLANNING IN DEVELOPING ECONOMIES

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Abstract. This entry reviews planning models as applied to developing countries. Aggregative, sectoral and project appraisal techniques are discussed. It is seen that while there was significant progress in the post-war period in devising sophisticated techniques, the ascendancy of market friendly reforms in the recent era has emphaized the use of dynamic and computable general equilibrium models. Many of the critical issues of the planning literature remain unresolved.

1. Introduction

This article critically reviews planning as applied to developing countries. Planning techniques are discussed in the following section, while the more general planning problem is addressed in section 3. It is argued that planning as a development exercise failed because planning models could not resolve the deeper issues of policymaking, coordination, incentives and the trade-off between efficiency and equity. The problems planning was designed to confront are by and large still present and the need for some kinds of planning persists. As a result planning has reemerged in a more market friendly variant, development policy management. Dynamic models and computable general equilibrium (CGE) models remain popular because they assist the management process in important ways.

2. Planning and Planning Models

Planning is a term that generally has fallen into disuse. It connotes, but does not logically imply, *command and control* mechanisms by which authorities issue directives for which compliance becomes a matter of administrative law. Todaro defines development planning as "the conscious effort of a central organization to influence, direct and in some cases even control changes in the principal economic variables (such as GDP, consumption, investment, savings, etc.) of a certain country or region, over the course of time in accordance with a predetermined set of objectives" (Todaro, 1971, p. 1). More modern conceptions of planning distinguish efforts that enhance the market allocation from those that would substitute for the market mechanism.

Planning in latter sense was attempted in the Soviet Union and to some degree in India in the immediate post-war period. Indeed, it was largely the success of the Soviet Union in raising per capita incomes in the first half of the twentieth century

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that demonstrated the existence of a practical alternative to market allocation. Soviet performance impressed policymakers in developing economies who had come to see the market as inadequate to the task of industrialization. Blaming the unplanned, anarchistic nature of capitalism for the slow pace of growth, developing economies looked to planning as an attractive alternative to unstable commodity prices, dependency and the "imperialism of free trade," as the French Marxist A. Emmanuel, put it.

Planning without enforceable command and control mechanisms was widespread in the immediate post-War period. The United Nations and other sources even withheld development aid unless a plan was in place and as a result, planning ministries became commonplace throughout the developing world. Planning models that demonstrated how foreign aid could be coordinated to achieve maximum impact on growth and development were especially popular.

Most economists agreed that *market failure,* including externalities, informational asymmetries and public goods, was more prominent in developing than in developed countries. Perspectives differed significantly on the extent to which government could improve outcomes by realigning social and private costs. In standard theory, a properly tuned set of taxes and subsidies could repair markets that failed and public sector institutions could fill in when markets were missing altogether. In practice, public policy often did not improve outcomes and the term *government failure* gained currency to describe counterproductive intervention by states even in the absence of command and control mechanisms.

In the traditional view, the planner's problem is to identify a relevant set of constraints on the growth of key economic variables. The constraints thus determine a presumably nonempty set of *feasible* plans. So identified, the planner's next task is to define a social objective function that permits the ranking of feasible plans. An *optimal* plan is simultaneously feasible as well as ranked at least as high as any other feasible plan. In planning theory, the parameters of the social objective function reflect individual preferences, while in practice they may reflect the preferences of the planner, bureaucracy or government agency responsible for creating the plan. Under some restrictive conditions, Heal has shown that plans in which individual preferences are constitutive of the objective function yield the same pattern of resource allocation as would a competitive market (Heal, 1973). Thus, there is nothing inherently inefficient about planning, at least theoretically speaking. In theoretical models, planners' preferences often proxy a social welfare function under the assumption that a freely functioning competitive market mechanism would produce an identical allocation of scarce resources.

Of course the weights must be calculated properly by the planners. The public choice literatures suggests that planning may be undertaken for the benefit of the planners themselves or their clients, and that command and control directives will give rise to rent seeking behavior and other principal-agent problems that deprive a country of needed resources and talents. A major problem arises when costs of a directive are widely distributed, while benefits accrue to a smaller set of individuals (Grindle and Thomas, 1991). Significant pressure to change course can develop as a result, with powerful groups lobbying to effectively push the economy on to an inferior growth path. In addition to concerns about market inefficiencies, *equity* was also considered a legitimate objective. The Coase theorem holds that efficiency and equity are separable, but the distinction in the early days of planning was blurred,

and this quite possibly led to inappropriate or clumsy interventions. Thus, many of the alleged market failures may have in fact been government failures.

Planning models can be classified in several different categories: aggregate, main sector, multi-sectoral, regional and project specific models (Chowdhury and Kirkpatrick, 1994). They may be simulation models or more traditional econometric models. The former use informal calibration procedures, while the latter are calibrated more formally, using statistical theory which is in turn based on the assumption of time-phased structural stability. The simulation approach was developed in response to the self-evident observation that structural stability is precisely what the process economic development is designed to undermine.

Planning models are useful for several reasons. The most obvious is that they allow policymakers to form quantitative estimates of the various trade-offs in preparing development policies. Planning models reflect the accounting regularities and conventions of national income and product accounts, balance of payments and income and expenditure balances of the public sector (Taylor, 1979). Analytical models combine behavioral equations with accounting identities from these sources. As a result, the planner becomes aware of limitations imposed by the adding-up principle implicit in the underlying accounts and limitations on the degrees of freedom of the parameters that determine behavior. These behavioral parameters can be calibrated to the data, but usually imperfectly with some degree of arbitrariness.

The resulting analytical models can comb out inconsistencies in the way in which policymakers believe the economy is working. The models also enhance communication, adding clarity to discussions within the policy establishment as well as been these individuals and politicians, the public and other interested parties, such as NGOs. The advantages of rigor are limited in that relying on abstract formulations can in itself inhibit communications, but this can be minimized by training seminars or forming teams incorporating individuals who possess the required interpretative skills.

Planning models also serve as a means of communication with outside aid agencies, signalling donors that donated resources will be used wisely and in ways consistent with the broad development objectives. They communicate the thinking about how the resources will be best employed and the explicit assumptions (behavioral parameters, elasticities and the like) underlying the model can be reviewed and evaluated by outsiders. Inappropriate assumptions can be identified and removed. In contrast, planning models with sufficient structural detail also can be used to counterbalance any undue influence of generic, one-size-fits all models in discussions of multilateral agencies.

The models quantify trade-offs and can be used to evaluate risk by exploring "what if" scenarios. "Best" and "worst case" scenarios bracket the expectations of policymakers and if monte carlo simulations reveal that a wide range of initial conditions converge to the "worst case", warning flags are thereby raised. Moreover, necessity of a one-to-one relationship between policy objectives and policy instruments, originally due to Tinbergen, shows how precarious is the entire planning mission. The collapse of earlier planning initiatives was in part due to a mismatch in this relationship, with goals grossly exceeding the number of instruments, other than command and control, available for implementation. Without careful attention to this problem, policymakers can be doomed before the first computer program is run. A quantitative presentation of the risks involved in proceeding

under significant uncertainty and without adequate instruments may itself become very useful, both in educating policymakers as well as providing incentives, at the political level, to develop additional instruments.

To be useful, a planning model must pass the "duck test" that is, the model must appear to be convincing to readers (Gibson, 2003). The model must resemble the actual economy modelled; in particular it should not be possible to observe or even compute characteristics of the model that are widely at variance with how the economy is perceived to work. If critics are able to produce evidence that a model does not look like "our economy" the credibility of the entire project can be seriously undermined. Critics can dismiss or raise spurious objections to otherwise accurate and useful models for perceived inconsistencies. Thus all properties of the models should be carefully constructed to agree with published sources.

Aggregate growth models which may involve either optimization or balance are due to Solow, Ramsey and Mahalanobis, Chenery and monetary models for financial programming at the International Monetary Fund and the World Bank (Chowdhury and Kirkpatrick, 1994). They can serve as guide to the formulation of lower-level models, providing control totals for more disaggregated approaches. Aggregate planning models are indicative of the potential growth path of the economy and can be used to generate various scenarios ranging from pessimistic to optimistic. The can also be used to determined optimal accumulation paths far into the future. One of the most well-known models in economics employs the calculus of variations to find the optimal savings rate, the one that maximizes the discounted value of future consumption. In the 1960s, a by-product of the space program emerged in the form of *optimal control* models, a dynamic analogue to static Lagrangian nonlinear programming models. The models were more flexible than the classical calculus of variations models of Ramsey and his followers, admitting piecewise continuous and inequality constraints.

Sectoral planning models have their roots in the model first described by the young Harvard graduate student W. Leontief just after the turn of the century (Blitzer et al., 1975). The interindustry or *input-output* approach pioneered by Leontief and first implemented in the Soviet Union, served a means by which consistent intersectoral plans could be drawn up. Input-output models have their roots in Quesnay's *Tableau Economique*, a physiocratic device that was the first effectively to separate real from nominal resources flows. In the standard input-output model, there is no substitution of factors in the production functions and final demand is exogenously determined, or in a later refinement later by a set of Engel curves. A dynamic version of the input-output model accounted for the accumulation of capital stock but was computationally clumsy and its linearity led to either a balanced growth turnpike or explosive diversion therefrom.

Linear programming models were introduced by Dantzig for the Air Force in 1947 and popularized in a classic text by Dorfman, Samuelson and Solow (Robert Dorfman and Solow, 1958). Since then, the procedure has gained wide acceptance and use in operations research and business planning as well as development planning. Generically, linear programming models belong to a class of models in which price plays a secondary role. It is not that prices are entirely absent, but rather that they are computed as *dual variables* in a scheme that holds the relationship between prices and quantities fixed. As an example, linear programming was used

in various planning models that tried to maximize employment by choosing a sectoral pattern of output consistent with a foreign exchange constraint or some other supply-side limitation.

Linear programming models can be considered multiple equilibria models, since there is typically more than one feasible solution. It fully embodies the traditional planning problem since a linear objective function is used to select from the set of feasible solutions the one with the highest ranking. This can be done by observation in models in which there are three or less choice variables, while the simplex method is employed for larger scale models. Since linear programming models are special cases of nonlinear programming models, the computer software available for the solution of the latter, e.g., General Algebraic Modeling System, Matlab, Mathematica, etc., also compute solutions for the former. Specialized packages exist for linear programming problems, such as Lindo, that are fast, efficient and give detailed computational results.

Because it combines inequalities and equality constraints, a linear programming model could be considered an algebraically indeterminate system, and certainly is so before it is solved. In the solution procedure, the specification of a marginal equality in effect selects the optimal combination of both equations and non-zero unknowns, converting an indeterminate system into one which is algebraically determinate by systematically eliminating some of the participating inequality constraints from the central equations of the model (the so-called base). As constraints are eliminated, the procedure sets the corresponding dual variable, or *shadow price* of the constraint, equal to zero and the constraint is said not to *bind*. The relationship between unbinding constraints and their associated shadow values is known as *complementary slackness* and has had perhaps the most profound impact on planning of any model in economics. To the extent that the objective function can be made to reflect marginal social welfare, complementary slackness conveys the principle that if a resource is not fully utilized, its marginal social contribution is zero. In the immediate post-war period, this provided insight into one of the most popular development models of the post-war period, that due to Lewis, in which surplus labor extracted from the traditional sector could be assigned a social cost of zero when it came to evaluating projects, public or private, in which they might participate. At the same time, it showed a generation of planners and economists that there could be a well-defined and computationally available wedge between the *social* and *private* cost of resources. At once, linear programming demonstrated a potential role for government policy, consistent with both micro and macro theory, as well as a technique to determine the scope of its implementation. Linear programming put development planning on its most sound footing, but with the price mechanism in a crucial, yet still subordinate role.

Computable general equilibrium models are usually multisectoral, economy-wide models, calibrated to a Social Accounting Matrix (SAM). These models may be static or dynamic with short run coverage of one to three years, three to seven for the medium run and long-term models that extends beyond a decade Gunning and Keyzer (1995). Static models compare two points in time without explicit attention to the path connecting these points while dynamic models connect a locus of points with explicit stock-adjustment processes. The models may exhibit a wide range of adjustment mechanisms, from closed, purely competitive, Walrasian models to macro structuralist models in which foreign exchange availability determines the

level of output in some key sectors. CGEs can be used to estimate shadow prices as discussed below.

CGEs in theory can be extended to address a range of related policy problems, such as environmental blocks. So long as stable contaminant coefficients can be found and linked to production and consumption levels, the models can generate an endogenously determined estimate of environmental quality along with its forecasts for production, consumption, investment and international trade. There are several important problems of implementation, however, the first of which is that contaminant levels can vary significantly between two industries that have been aggregated into a larger category and even within an industry pollution levels can vary between two firms. Moreover, the coefficients presently in use are derived from studies of U.S. manufacturing firms and one can only guess how these coefficients would need to be adjusted to conform to conditions in developing countries. Without some detailed microeconomic analysis built into the model, it might become difficult or impossible to judge how firms would react to the introduction of tradeable emissions permits, that is, pollution rights that can be bought or sold in a specified market.

Existing CGEs could adequately capture a command and control system that targeted output levels, but would fail to capture technical change that was in part inspired by trends in environmental protection. Moreover, models that do not include a feedback loop from the toxic contaminants to price or output levels would also fail to capture reality. These models are currently in their infancy, however, and while environmentally augmented CGEs have been employed in a small subset of developing countries, they are far from reaching their full potential.

Regional models comprise a final subcategory of planning models. Since data requirements are large and data availability is scanty, regional models have lagged behind. It is clear however, that in the case of India and China, which together represent almost half of the developing world, regional models are not merely desirable, but necessary. Combining regions in China could be as misleading as aggregating North and South America, and therefore an aggregate planning model would distort rather than report the true state of economic activity.

3. The Planning Problem

Despite its increasing technical sophistication and theoretical appeal, planning in the post-war period led to widespread disillusion and rejection by even formerly ardent supporters. By the end of the 1970s, Chowduhury and Kirkpatrick note that many economists were talking openly about the failure of planning and as early as early as 1965, Waterson had concluded on the basis of a study of 55 country experiences that "the majority of countries have failed to realize even modest income and output targets..."(Chowdhury and Kirkpatrick, 1994, p. 2).

Planning failed largely because of the lack of political power or will to enforce command and control measures in the absence of appropiate incentives. When targets were missed, little could be done other than revise the targets. Certainly outside the Soviet Bloc few planners had the executive power implicit in the command and controls scheme. To the extent that they had power at all, private sector participants may have come to regard the planning bureau as simply a marginal cost of doing business, swelling the ranks of government officials who were entitled to bribes, kickbacks or other considerations. Toothless plans would have no effect

on resource allocation whatsoever, other than absorbing talent that could have been better applied elsewhere. Planning was also unbalanced, with excessive attention to investment in capital goods without commensurate attention to ancillary policies, such as human capital investment, proper incentives, rural-urban migration, and the development of strong institutions. While planning missions often failed, the success of less thoroughly planned economies in South East Asia further indicated the presence of diminishing returns to the effort.[1]

As a direct consequence of poor performance, countries have implemented free market policies as the only practical alternative. The policy environment changed, with countries replacing the principles of import substitution with the Washington Consensus. Since import substitution industrialization was often the *raison d'être* of much of the planning effort, planners were left with little to do. The ascendancy of the Washington Consensus did not entirely eliminate the need for all forms of planning, however, since among its central recommendations is that the state should provide public goods, develop regulatory institutions and protect private property. Not surprisingly, the reappearance of these pro-market principles has inspired fresh thinking. In an influential book, for example, de Soto emphasizes the lack of clear title to property as a key institutional barrier to progress in developing countries (de Soto, 2000); traditional planning rarely referenced such concerns.

Unintended consequences associated with incentive-blind systems gave rise to a more limited form of planning, now know as *development policy management*, that explicitly strives for market outcomes. Rather than having to anticipate the various ways in which the private sector may try to evade the planners' directives, modern theory suggests that a market driven approach can yield more satisfactory results. Planners set broad overall planning objectives and then encourage the private sector to maximize their own interests subject to these imposed constraints. Tradeable emission permits, mentioned above, are a well known and successful example of policy management in which policymakers determine a prescribed level of environmental contaminants and then issue a control total of emission permits consistent with that goal. Producers buy and sell these permits, enabling the most efficient mechanism to achieve the social goal. Decisionmaking is decentralized and the social cost of compliance is minimized.

This enlightened approach takes much of the conflict out of planning and the negative connotation associated with command and control is thereby lessened. As states abandoned coercive methods, fewer trades were blocked, economic efficiency increased *ipso facto*. But the a market friendly approach does ignore an important by-product of earlier methods. To plan an economy required and still requires that planners understand their economy in fundamental ways. This implies the identification of binding resource constraints across the spectrum of factors of production and setting in motion policies that incrementally relax those constraints in proper sequence. Early planners had first to become analysts. Planning exercises were therefore fruitful in their own right, even if they could not be immediately, fully and efficiently implemented. Just as important, planning exercises would enable analysts to make a more convincing case to outside donors and creditors that assistance to remove specific bottlenecks was needed.

[1]Both advocates of the free market as well as the *dirigiste* approach claim the same countries as evidence of the superiority of their priors.

In Southeast Asia planning focused on coordination, removing barriers imposed by asymmetric information or inadequate public goods and the like, leaving the private economy to determine resource allocation in a decentralized way. Perhaps, the public sector in the new industrialized countries did "get the prices wrong" in Amsden's infelicitous phrase, but the price system is just one form incentives can take. While prices were wrong in S. Korea, for example, the overall incentive structure was not. Good planning harmonizes these incentives with overall social goals, much in the same way that tradable emissions permits or congestion pricing might. Resistance to the plan is minimized since the private sector is free to maximize its profits in the short run. Planners are policy managers rather than makers of rules that require enforcement.[2]

Proper incentives were often ignored in early planning and this was reflected in the models themselves. Planning models of the 1960s and 70s embodied the conventional wisdom that quantities mattered more than prices. This was a direct corollary of the Keynesian theory of effective demand that held that price adjustment alone could not correct severe macroeconomic imbalances. As a result, early planning models focused on quantity adjustment to the almost complete exclusion of prices.

There was a practical side to this choice in addition to the Keynesian theory that underlay the approach. Computational capacity was inadequate to the task of computing equilibria with a large number of markets and flexible prices. Initially quantities were studied in isolation, such as in aggregate growth models or input-output frameworks. As noted above, prices appeared later, but only as dual vectors that accompanied quantity calculations. Prices did not directly influence quantities. Realistic possibilities of substitution in production and consumption, price incentives, and the rapid swings in the distribution of income arising from movements in relative prices or the real exchange rate were absent.

The first models that took price seriously were, oddly, so-called one sector aggregative models, in which aggregate demand depends upon, *inter alia,* net exports. Since the real exchange rate must figure into the definition of net exports, a relative price could make an important difference to the growth path of the economy. Detailed models in which prices figured more prominently followed the evolution of computational capacity. Now with virtually unlimited amounts of power available to even novice researchers, elaborately detailed models can be constructed. CGE models broke tradition in the planning scheme by introducing the effects of the price system directly into the solution for quantities. As CGEs became dynamic, they became useful because they could capture incentives, uncertainty and institutional detail much more faithfully. While CGEs arose from a marriage of traditional Walrasian models and computers, it was obvious that they were not limited to traditional welfare analysis with its emphasis on optimality and market distortion. While welfare loss arising from distorted markets was numerically insignificant, incentives incorporated into relative price movements were not. The calibration procedures allowed users to determine the proper mix of influence of price and quantity adjustment in establishing a temporary equilibrium.

[2]The rational expectations revloution in macroeconomic can be seen as an expression of generalized planning failure to the extent that monetary policy relies on undermining private sector objectives. If the preference structure of the economy is consistent with a natural rate of unemployment and policymakers try to impose some other rate, it will only generally be possible in the short run.

At present it seems unwarranted to expect a resurgence of traditional planning approaches to the static allocation problem. The exigencies of environmental decay, urban sprawl and global warming, however, have place renewed emphasis on longer term thinking. Even if resources are efficiently allocated statically, a sequence of Pareto optimal states need not be Pareto optimal when viewed as a sequence (Robert Dorfman and Solow, 1958). Hence markets may function well to allocate resources over space, yet do a poor job over time. This is especially difficult when the allocation problem stretches over generations, some of which are not yet born. Heal argues that markets systematically err in valuing the future (Heal, 1998). Thus, inadequate capital accumulation due to uninsurable risk, credit rationing, asymmetric information and other imperfections is related to, though not the same thing as, imperfections that block trades between agents who happen to be alive at the same time. In this limited but important regard, the coefficients in the planner's objective function may be more accurate than market determined weights.

4. Project Appraisal and Cost Benefit Analysis

Public sector projects for electrification, hydrological development or transportation and communications infrastructure are key components of any development plan. As such they represent the ground floor of the planning exercises upon which sectoral and ultimately economy-wide static and dynamic models are based. Costs and benefits of projects are therefore optimally evaluated using this hierarchical methodology in which the project is sequentially evaluated at ever higher levels of aggregation. Eventually, of course, the model may not "see" the project, having lost sight of it due to rounding errors, simply because the project is too small to matter at the aggregate level.

The private sector criterion for project acceptance is either that the present discounted value of costs and benefits as they are distributed over time should be positive, or that the internal rate of return of these same costs and benefits exceeds the cost of capital to the firm. Because externalities are so prominent in developing countries, however, the private project selection procedure has long been considered inadequate for use by development planners. While the present value template itself is appropriate, it is social costs and benefits, rather than private, that must be reconciled. Typically this implies using shadow rather than market prices to evaluate project costs and benefits. Shadow prices are intended to reflect the marginal social benefit of available resources. Computation of these shadow prices, however, is fraught with error due to the large number of assumptions required for their determination. Faulty calculations can easily send the results off in an unruly direction such that projects that would utterly fail a private screening, or even one with properly calculated shadow values, are nonetheless accepted. Since shadow prices are themselves defined as measures of the impact of the project on aggregate utility, the effect on welfare of inappropriately selected projects would be obvious. Debate over project appraisal often devolved into a derivative debate on how to correctly calculate shadow prices. As a result, some lost faith in the planning exercise as a whole.

As noted above, the linear programming approach imputes a shadow value of zero to factors of production in excess supply. This is extreme to say the least, but does indicate how economy-wide models can be used to determine the social value of resources. Much of the early literature was devoted to calculating shadow

prices in specific markets; labor, both skilled and unskilled, foreign exchange, and capital markets. More recently, however, the availability of computational capacity has refocused efforts on more elaborate models that go far beyond what is possible to achieve analytically.

The Little-Mirlees approach to shadow pricing is by far the most widely accepted (Little and Mirlees, 1974). The economy is divided into traded and nontraded goods markets and there is a competitive primary factor market as well. The shadow price of traded goods is simply the border price, since the import border price is the clearest measure of what the country is willing to give up in order to secure an additional unit of a good. Similar, if foreigners are willing to pay the border price for our exports, that stands as the next best alternative to any domestic use. It is a straightforward application of the basic principle of opportunity cost.

Nontraded goods are more difficult to shadow price. If there happens to be a factor of production for every traded good and input-output relationships are known, it would be possible to solve for the shadow prices of nontraded goods and factors as a function of the known traded goods prices. But of course, this is a very special circumstance. If the number of factors is greater than the number of tradables, then the indeterminacy must be removed by additional information. If, for example, it is possible to deduce the foregone output of a traded good upon removing a unit of unskilled labor, then we would have a measure of the shadow value of unskilled labor that could be used to reduce the number of unknowns. If the number of factors were less than the number of tradables, the system would be overdetermined and there would exist two shadow prices for the same good.

Eventually shadow prices could be calculated directly from computable general equilibrium models, but this did not fully resolve the problem either. Model structure clearly matters and moreover, shadow prices are sensitive in general equilibrium models to how projects are financed. If a project is offset by an increase in lump-sum taxes, then the effect on aggregate welfare is the simplest to calculate. But since these tax vehicles are not usually available in developing countries, one immediately has to contend with distortionary mechanisms like income or sales taxes, which add another assumption-laden level of complexity to the analysis. Other complications include economies with segmented goods (traded and nontraded) and labor markets (which may also be regulated), large informal sectors, credit rationing, an inadequately developed or captured regulatory apparatus and the like (Squire, 1996).

Projects can be accepted that are not Pareto optimal since they may easily imply a loss of welfare to some members of society while others gain. Income distribution need not, however, be taken into account in project appraisal if an appropriate scheme of taxes and subsidies is available to compensate losers. This is big "if" however and some authors have tried to incorporate distributional concerns directly into the procedures for project evaluation. Government policymakers may choose to redistribute income from current to future generations or within the current generation from one class of households to another. As Chowduhury and Kirkpatrick note, distributional weights applied to utility representations of individual households is an explicitly subjective exercise, which varies across both time and space (Chowdhury and Kirkpatrick, 1994, p. 2). Efficiency calculations are rarely of such magnitude that they cannot be reversed by small changes in weights in the aggregate welfare function. For this reason, planners have been reluctant to

mix concerns of equity and efficiency. Indeed, shadow pricing has largely been a causality of market friendly reforms that emphasize more objective data, usually border prices for traded and consumer prices for nontraded goods.

Public investment in infrastructure projects including electrification, telecommunications, transportation and marketing facilities would seem to address problems of static and dynamic market failure. Oddly, it has been argued that there in fact has been *too much* investment in infrastructure since project evaluation techniques, even when undertaken by competent World Bank economists, fail to properly account of the welfare loss in cost recovery (Squire, 1996). But welfare losses per dollar of public revenue raised are typically calculated using static computable general equilibrium models and therefore cannot account for the dynamic market failures. What for, example, is the net benefit of advancing the economy along the path to the so-called Lewis turning point, at which all surplus labor is absorbed from the traditional to the modern sector? To speed the economy along this path, coordinated decisions about such investments have to made and this, of course, requires planning. Planning as practiced may have failed, but this does not mean that the market would have succeeded without some forms of guidance.

5. Conclusions

While it could be said that advances in computational capacity, communications, data gathering and processing may restore some of the lost attractiveness of planning, it must be recognized that the solution to the agency problem is as elusive as it was four decades ago. Problems as "straightforward" as project evaluation in economies with surplus labor cannot be attacked without broad political consensus as has been achieved in successfully planned economies from South Korea to Scandinavia to China. These economies solved the planning problem by first solving the agency problem.

Market prices are indeed more objective in the sense that they are not under direct administrative control and thereby represent a confluence of forces, or "wisdom of crowds." But the numerous theoretical problems identified in the post-war planning literature, problems of market failure, externalities and public goods, remain. They were not resolved by the planners and are now, as they were before the emergence of that literature, simply unaddressed.

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