

# NON-WALRASIAN PROPERTIES OF THE CUBAN ECONOMY: RATIONING; LABOR SUPPLY, AND OUTPUT

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## I. Introduction

The range of opportunities to carry out empirical research on the Cuban economy is generally limited by the lack of data or by the nagging suspicion that the available data do not tell all there is to know, especially during the last thirty three years of government control of the sources of information. Economic theory, however, can be applied to understand many problems, including those associated with important policy implications that often require a qualified opinion even when they cannot be thoroughly investigated for lack of data. In this paper, economic theory is applied to explain how individual preferences are still able to play a fundamental role in the Cuban economy, despite the lack of opportunities to exercise free choice.

Though individual choice is oppressively constrained in Cuba and free markets are virtually non-existent (with the possible and highly qualified exception of black markets), Cubans have found ways to accommodate their preferences in terms of their own orderings or priorities, not the government's. The Cuban Government has been able to apply its power by imposing constraints, but this power does not appear to be capable of changing the ordering of individual preferences within constrained choice sets.

Despite massive ideological indoctrination and political intimidation to change values (preferences) in Cuba, there is no evidence that general patterns of individual behavior (consumers' and workers') depart from the neoclassical tenet of utility maximization. The Cuban Government's apparent inability to recognize or understand this principle has caused grave damage to the productive capacity of the country. Yet, the notion that utility maximization is still an important principle to explain consumer and worker behavior in Cuba serves to provide some explanations for the performance of the national economy during the last three decades.

From the outset, government policy in Cuba was against the market system, blaming it for most of the country's economic and social problems. Instead of correcting market imperfections and distortions, the government decided to install a command economy under a central planning system. The notion of general equilibrium was implicit in central planning, but the real challenge was, at least from an economic point of view, how to achieve equilibrium while administering prices and quantities of a number of goods and services. The introduction of rationing consolidated the notion that if equilibrium was feasible, it would not be Walrasian since rationing would prevent the clearance of at least some markets. As rationing was extended to almost all kinds of markets, however, it became apparent that equilibrium may not be attainable based on three critical conditions: a) market inflexibility, b) the elimination of signals to guide resource allocation processes towards their most efficient uses, and c) the concomitant elimination of incentives to work. All this contributed to create an economic system incapable of achieving equilibrium, let alone the grandiose targets fixed by the government at different times. The magnitude of the ensuing economic crisis makes one wonder about whether its main cause is an outstanding incompetence on the part of the Cuban leadership or whether there is a different public policy agenda.

This paper consists of an analysis of the effects of rationing on the labor supply in Cuba, and

its subsequent impact on the national levels of output. The paper applies Becker's (1965) theory of the allocation of time to build a model linking the effects of rationing of goods with the supply of labor. The paper also provides the analytical groundwork to explain the current policy to attract foreign investments and to anticipate some of the effects of a process of price liberalization, when such opportunity arises.

## II. Theoretical Background

There is relatively little research about the relationship between rationing of goods and the supply of labor. A serious political issue in Great Britain during the Battle of England (there was constant war propaganda appealing to workers' patriotism to work beyond material incentives constrained by rationing of goods), rationing was sparsely investigated in the fifties and sixties and more intensely afterwards.

Among the earliest work is Samuelson's (1947) who identified the Le Chatelier principle to characterize the reduction in price elasticities of non-rationed goods when rationing is introduced. Later, Henderson (1952) developed a model of consumer choice under multiple constraints that opened the way to the application of constraints other than income. Tobin and Houthakker (1950-1951) concentrated exclusively on forms of demand elasticities under rationing, McManus (1956) formulated rationing theory based on revealed-preference theory, and Shinkai (1966) compared the advantages of straight rationing (quotas), point rationing (coupons), and consumption taxes. The only study that included some considerations about income and leisure was Tobin's (1952).

More recently, Hirshleifer (1980) discusses the basics of rationing and of time as a constraint, but without going into the effects on the supply of labor. Kooreman and Kapteyn (1985) employed a model by Deaton and Muellbauer (1981) that jointly determines family income and male and female labor supply of individual households in the Netherlands, but the concept of rationing is applied to the supply of labor. Neary (1987) briefly reviews rationing theory without going into the area of interest of this paper. Benassy (1987a), on the other hand, presents a treatment of rationed equilibria that opens a promising methodological avenue to investigate the Cuban economy in terms of non-Walrasian general equilibrium. In this context, it is worth mentioning Benassy (1987b) again and his work in the analysis of disequilibrium.

Walrasian equilibrium is achieved when all markets (consumer and factor goods and services) clear under conditions of free choice by supply and demand agents. The equalization of supply and demand is possible when prices are flexible. Price inflexibility, on the other hand, will lead to disequilibria, either as excess supply or excess demand in certain markets. As soon as inequality constraints or ceilings are imposed on prices, rationing usually follows in the form of queues as excess demands persist. A rationing regime may be implemented as an attempt to organize the distribution of the affected goods or services and reduce the uncertainty and inconvenience of waiting lines. Though there are several rationing regimes, the quota system is the only one examined in this paper, since it is the predominant form of rationing instituted in Cuba. This system consists of imposing a maximum amount allowed to be purchased by each buyer at the official (fixed) price per period.

When well calculated, the quota should be able to "clear" the market in the sense that no queues are necessary. The presence of queues is a signal that official quotas are not always fulfilled by the suppliers, and that buyers do not trust that a given shipment has enough quantity of the rationed good to satisfy all the quotas at a given distribution point. Chronic inability by the

government to keep the promised quotas in Cuba explains why waiting lines have become a permanent feature of life in the country. Thus, in rigor, queues cum rationing mean a rationing regime within another.

Regardless of the reliability of the rationing quotas, there are at least two ways in which a non-Walrasian equilibrium can be achieved. One is allowing sufficient free market transactions in which individuals can exchange rationed goods at prices different than those officially established. Therefore, free markets can help achieve balance between demand and supply under a system of partial price flexibility.<sup>1</sup> The other form of non-Walrasian equilibrium could be achieved with a very competent, precise and disciplined bureaucracy that would calculate prices and ration quotas consistently according with demand and supply conditions. This of course would never be as efficient as a totally free market system, but it would have a better chance of achieving equilibrium under strict a socialist or communist administration.

A necessary condition to achieve equilibrium in such circumstances is to avoid that the rationing system provoke a reduction in the supply of factors of production, especially labor, to the point of forcing a reduction in the levels of output that support the established rationing quotas. Despite imperfections, and price rigidities and distortions, there are factor markets in Cuba. In the case of labor markets, it is important to keep in mind that the supply is private, while the demand is mainly public. Thus, the former is more likely to react to price and market signals more quickly than the latter.

Yet, contrary to basic principles of efficient resource utilization and to its own economic interests, the Cuban Government adopted a combination of rationing regimes and sets of prices that deepened the inefficiency of the intrinsically inefficient socialist economy. Such a combination of variables seems to have thrown the Cuban economy into a state of monotonic (non-oscillatory) dynamic disequilibria. Market inflexibility combined with a rationing regime of arbitrary quotas and caused a contraction in the supply of labor, followed by a contraction in the levels of output that fed back into the reduction of the rationing quotas.<sup>2</sup> This positive (reinforcing) feedback system created an output deflation spiral that can be singled out as the pivotal cause of disequilibria of the Cuban economy. It is also the cardinal cause of the country's inability to be economically viable, leading to its chronic dependence on external subsidies. The demise of the Soviet Union and the Socialist block has forced a drastic reduction of the subsidies, and a major adjustment of the Cuban economy, throwing the country into what may be the worst economic crisis of its history.

### III. The Functional Relationship Between Rationing and the Supply of Labor

The traditional approach to consumer behavior is based on the principle of utility maximization in the presence of an income constraint and a given set of prices. Consistent with this approach, preferences between income and leisure were defined to explain individual labor force participation. This theoretical construct could be used to establish the functional linkage between rationing and the supply of labor. This model, however, focuses on the structure of preferences between income and leisure and does not lend itself to the analytical objectives of this paper. Becker's theory of allocation of time is preferred in this paper because it is more adaptable to

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<sup>1</sup>This means that the consumers' budget constraints are "kinked" at the point where the quota inequality is intersected.

<sup>2</sup>In many cases the reductions were not made official but materialized in form of delays in the delivery periods. For instance, quotas that were supposed to be delivered every week would take eight or more days. If the situation persisted for a long time, the quota could be officially reduced.

empirical investigation and suitable for explaining labor phenomena in terms of changes in relative prices and levels of income, rather than in terms of changes in consumer-worker preferences or tastes.

Another reason to apply Becker's model is that, in focusing on the allocation of time, it provides a powerful methodological opportunity to study individual behavior in Cuba, since time is virtually the only resource over which Cubans can still exercise a certain degree of control. Becker's model introduces the time factor as a second constraint, especially focusing on the amount of time available for consumption activities. This constraint is partially convertible in income through the labor market.

The traditional individual income constraint requires little explanation and is given by the following equation:

$$\sum p_i x_i \leq wT_w + I_0 \quad (1)$$

where  $p_i$  is the nominal price of good or service  $i$  (for  $i = 1, \dots, n$  in an  $n$ -dimensional choice set or, simply, in a world of  $n$  goods and services) and  $x_i$  its quantity, while  $w$  is the wage rate by unit of time,  $T_w$  the amount of time dedicated to income generating activities, and  $I_0$  income endowments.<sup>3</sup>

The consumer will also face a time constraint for consumption activities and leisure. The corresponding equation, however, requires some explanation for those not familiar with Becker's theory of allocation of time. This theory is based in the Lancasterian notion that commodities purchased by consumers do not directly produce utility. Rather, they are inputs in household production functions that actually generate the utility-bearing goods. In such household production functions, time itself is an input, and  $w$  its price.

Therefore, if a consumer buys  $x$  units of a good  $i$ , he must pay a price in money  $p_i$  and dedicate a certain amount of time (a price in terms of time) to elaborate it in the household.<sup>4</sup> Thus, utility is not directly generated by the amount  $x_i$  but derived from the final household consumption good produced with  $x_i$  as an input. For mathematical simplification, the household production function is obviated here, and fixed coefficients of household production are assumed. This yields the following equation:

$$\sum t_i x_i \leq T_c = T - T_w \quad (2)$$

where  $t_i$  is the "price" in time needed to process and consume a unit of  $x_i$ , and  $T_c$  is the total time

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<sup>3</sup>This is the income received in the form of pensions, bank account proceeds or regular government payments, if any, to former owners of confiscated property that may still reside in Cuba.

<sup>4</sup>Even pure leisure usually needs complementing with money. See Juster and Stafford (1991) for an empirical study on this subject.

dedicated to consumption activities (sometimes called leisure time). As total available time  $T$  in a given time aggregation horizon is equal to  $T_c + T_w$ , we have the following result:

$$\sum (p_i + wt_i)x_i \leq wT \quad (3)$$

This represents the actual constraint against which consumers may maximize utility. It can be called the full-income constraint and provides a richer conception of price, given by  $(p_i + wt_i)$ . The second term of the sum represents the opportunity cost of that particular consumption activity, or another reminder of the notion that time is money.

The utility-maximizing consumer<sup>5</sup> with a utility function  $U=U(x_i)$  will choose the values of  $x_i$  such that each binary set of relative prices  $(p_i + wt_i)/(p_j + wt_j)$  (for each  $i, j=1, \dots, n$  with  $i \neq j$ ) to be equal to the corresponding marginal rate of substitution  $-\delta x_j / \delta x_i$ . If at least one of the prices  $p_i$  is fixed below the equilibrium level that clears that particular market, some form of rationing will appear, preventing those consumers that can afford buying more than the corresponding quota from achieving maximum satisfaction with their levels of income.

The introduction of additional constraints in the form of straight rationing quotas will be analyzed by means of a graphical representation. A two-good world without savings is postulated by aggregating the  $n$  goods into two major groups 1 and 2,  $x_1$  representing quantities of the aggregate commodity that is relatively less expensive in terms of money but relatively more time consuming or time intensive. This means that  $x_1$  has low  $p_1$  in relation to  $p_2$ , while  $t_1$  is high relative to  $t_2$ . Consistently,  $x_2$  represents quantities of the more expensive commodity aggregate in terms of money, but less time consuming relative to good 1.<sup>6</sup>

This is better understood by means of examples of close substitutes. For instance, raw food to be prepared at home costs less money and more time than pre-cooked food or preserves. Old clothing mended at home is more money saving and time using than new clothes. Watching a baseball game on television is more money using and time saving than watching the same game at the stadium, because of transportation costs and the exceedingly inexpensive tickets that the Cuban Government has made available to the population. Laundry sent to a shop is also relatively more money using and time saving than laundry done at home. Finally, repairing the old car or TV set is generally not only less expensive in money and more time using than buying a new one, but the

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<sup>5</sup>I avoid the term *rational* to leave room for those who, following the communist creed, may behave unselfishly or with opportunism but still rationally without satisfying these optimality conditions.

<sup>6</sup>We assume that the following condition is verified:

$$\frac{p_2}{p_1} < \frac{p_2 + wt_2}{p_1 + wt_1} < \frac{t_2}{t_1}$$

only option available in Cuba.<sup>7</sup>

Figure 1 represents a worker-consumer for whom ration quotas are effective, i.e., are placed below his equilibrium position under free choice. The figure depicts several equilibrium positions, starting with the one consistent with Walrasian equilibrium and moving towards other equilibria as different policy measures are implemented. Line  $II'$  represents the two-dimensional version of equation (1), i.e., the traditional budget constraint. Line  $TT'$  represents the time constraint generalized in equation (2). The convertibility between the time dedicated to consumption  $T_c$  and the time dedicated to generate income  $T_w$  determines that shifts of both constraints are always in opposite directions. An upward (downward) shift of  $TT'$  that augments (diminishes) the availability of consumption time is simultaneous to a downward (upward) shift of the income constraint  $II'$  diminishing (augmenting) earned income. The reader should notice that lines  $II'$  and  $TT'$  move as a pair of scissors, since the full-income constraint  $FF'$ , or dotted line, is the locus of all possible intersections of  $II'$  and  $TT'$ .

The full-income constraint equation is not shown to avoid overloading the graphic, but is the two-good version of equation (3).  $FF'$  only changes its position when the wage rate changes and/or the relative prices in money and time terms change. At this point there is no need to be concerned with different levels and slopes of  $FF'$ . The important point is that it is under this constraint where the consumer maximizes utility by selecting a bundle of goods that determines simultaneously its allocation of time between the labor market and household activities, including pure leisure.<sup>8</sup>

In Figure 1, the worker-consumer maximizes satisfaction at point A under conditions of free choice, i.e., before any extraneous constraint like rationing is introduced. Point A represents a specific bundle of goods in quantities  $x_1$  and  $x_2$  and a level of satisfaction depicted by indifference curve  $U_1$ . Discarding any changes in prices, he could only improve his standard of living (level of utility) if the wage rate  $w$  rises. Likewise, his level of welfare would be reduced if the wage rate is lowered.

Though the early signs of rationing appeared in Cuba in 1960 and became more apparent in 1961, in the form of waiting lines, a formal regime was not implemented until March 1962 in Havana and other urban centers of the country. The first goods to suffer severe scarcities, and even total disappearance from the market, were generally imported. Many of these goods were time saving but relatively expensive in terms of money, like consumer durable goods, canned food, all kinds of spare parts, apparel, etc. In general it can be said that rationing was more severe in relation to time-saving, money-using goods than in time-using, money-saving goods. This is depicted in Figure 1 by the vertical line representing the constraint (or aggregate quota)  $x_2 \leq Q_2$ .

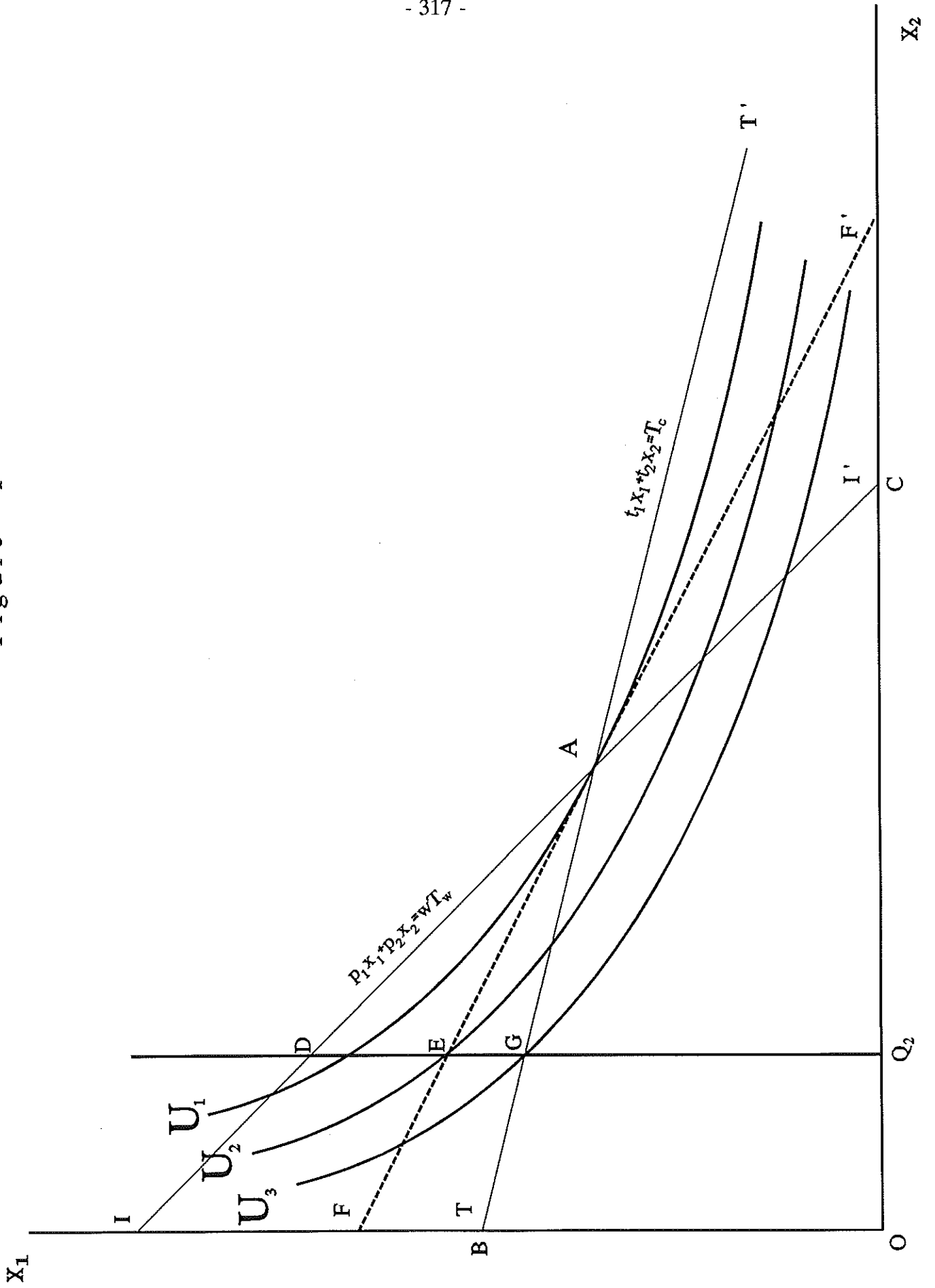
The first result of this new situation is that the consumer will suffer a welfare loss since the optimum position A is no longer attainable. As the maximum quantity the consumer can buy

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<sup>7</sup>In Cuba, rationing is not universal. We should recognize an upper class of Cuban officials and party leaders who enjoy more freedom of choice as consumers. As they are mostly bureaucrats, it is reasonable to assume that their implicit salaries are above the value of their marginal productivities, therefore, their net contribution to the national economy as workers must be negative. In the strictest Marxist analysis based on the labor theory of value, they are net consumers of surplus value and, by definition, exploiters. The essential difference between this type of exploiter and the capitalist stereotype is that the latter contributes to the equilibrium of the economy while the former contributes to deepen its disequilibrium.

<sup>8</sup>Pure leisure could be defined in several ways, but none of them would be significant enough to alter the results of the ongoing analysis. Nevertheless, it is suitable to recognize the possibility of extreme idleness or non-utility producing time in some extreme circumstances where severe insufficiencies of goods (or money) appear.

Figure 1



(legally) is  $x_2=Q_2$ , he will also be confronted with an excess of money and a shortage of time at the suboptimal position A. In order to achieve this constrained maximum, however, he would have to retire time from the labor market to have more time for consumption.

Under these circumstances, the new equilibrium is at point E, where level of utility  $U_2$  is attained, but it does not satisfy the first-order optimality condition of equalization between relative prices (in terms of full income) and the marginal rate of substitution between aggregate goods 1 and 2. This condition would be consistent with non-Walrasian equilibrium if the level of output for the entire economy could sustain the quotas. As we proceed, we will notice that equilibrium has not been attained and it may not be attainable until the system reaches an extreme point.

But before we proceed, let us finalize this section by pointing out that as ration quotas tend to be uniform for the entire population, at least in principle, workers with higher wage levels will have a stronger incentive to transfer time from the labor market to the household than workers with lower wages. The same can be said for individuals with non-wage income. This implies that this system of rationing generates a backward-bending supply curve of labor when rationing is severe enough and is biased against time-saving goods, since it reduces and even eliminates incentives to work for income.

This condition becomes more detrimental to the Cuban economy as there are little or no incentives to save either. If the Cuban economy were more flexible, intertemporal transfers of resources could be channeled through savings. If there were a well-founded rationale for current sacrifices, individuals would nurture rational expectations for a higher level of utility tomorrow at today's expense.

#### IV. From Utility Maximization to Mandatory Altruism

A market exists as long as there is the possibility of a transaction or trade. Although extremely imperfect and even hard to observe, labor markets exist in Cuba since there are many forms of supply of labor as well as many forms of demand. True, there is very little, virtually no mobility in such markets, no equilibrium possibilities, let alone a mechanism for wage determination, beyond bureaucratic formulas. Nevertheless, workers have shown and continue to show reactions to the lack of incentives to work. As soon as rationing appeared in the early sixties, a frequent complaint by the government was about the pervasiveness of absenteeism. Such a phenomenon appears to have been most frequent in industries with flexible hiring regimes and shifts such as agriculture, construction, transportation, and longshoremen, rather than being subject to fixed office hours or shift indivisibilities.

Thus, absenteeism in Cuba appears to be the most expedite vehicle for individual workers to affect the supply of labor in the short-run. Possibly the second most important vehicle (or perhaps the most important one, though not as obvious) is by reducing the intensity, efficiency or level of dedication to their individual jobs (shirking). This in fact, reduces the supply of labor in efficiency units but it would be more easily observable in terms of labor productivity decreases. Mesa-Lago (1981, pages 132-139) provides an excellent review of this chronic condition of the Cuban economy under socialism.

Though there is no solid quantitative evidence about the level of absenteeism, the continuing public complaints uttered by government spokesmen provided the most significant evidence that the phenomenon reached alarming proportions. To combat absenteeism, the government adopted a two-



pronged approach. On the one hand, repeated appeals were made to patriotic values and revolutionary fervor by the media and all instruments of mass control available to the government, including meetings at the work place, etc. On the other hand, the government adopted measures that were tantamount to attempts to ration leisure or consumption time. During certain periods, police forces would comb beaches asking bathers for identification cards and proof of being on vacation. Another attempt was the recruitment of volunteers (in many cases under a certain amount of pressure) to work in agriculture, mostly during harvest times.

All this implies that as many worker-consumers were adjusting their new equilibrium positions after rationing was imposed, from point A to point E (Figure 1), the government was pushing in the direction of point G, an even inferior alternative from the point of view of the utility mapping ( $U_3$ ). A consumer would be at point G by conviction (altruism) or by compulsion. Without compulsion, the segment EG represents the spectrum of possible attitudes with respect to the stated ideological goals of the revolution; the building of a new man devoid of greed. The closer consumers are to E, the less realistic the official policy would be in terms of depending on moral incentives--rather than on material incentives--to develop the economy. On the other hand, the closer they are to point G the greater the success of the government in forcing individuals to behave as if they were real socialists, or in convincing that they in fact are socialists.

It is important to notice that at point E, lines  $II'$  and  $TT'$  could intersect, which means that individuals would spend all their earnings and all their consumption time, but they would be maximizing their utility at the second best level  $U_2$ . At point G, however, lines  $II'$  and  $TT'$  continue to intersect at A. All the time available for consumption would be spent, but not all the money. Consumers would find that at the end of the period, after having conducted their purchases in legal markets only (this assumption is lifted below), they would have excess earnings measured by  $DG/p_1$ , their contribution to the monetary overhang. The standard of living given by  $U_3$  is inferior to second best  $U_2$ .

In the aggregate, the reality would probably be somewhere between points E and G, possibly more as a result of indivisibilities of work shifts than of altruistic (true or dictated) consumer behavior. Wherever the equilibrium position is, it does not appear to have stability conditions, i.e., it could fluctuate up and down, adding uncertainty to the Cuban economy's production capabilities. The closer that equilibrium point is to E, the more severe is the contraction of the supply of labor and its deleterious impact on Cuba's output capacity and vice versa.

Notice that if the government had opted for price flexibility to take care of any shortages, they would have left the work incentive system intact. The shortage of time-saving goods would have caused a raise in prices. This would be represented in Figure 1 as a reduction of the slope of line  $II'$  and a corresponding reduction in the slope of the full-income constraint  $FF'$ . It can be demonstrated that the new equilibrium position is inferior to the one corresponding to point A, but superior to E.

This point is made to establish the differences between the Walrasian and the non-Walrasian forms of equilibrium. In the former case, without rationing, there would be a less egalitarian distribution of the rationed goods, but no loss of the incentive to work. In the latter case, the distribution would be more egalitarian, but there would be a loss of the incentive to work. In this case, the poor will not suffer the consequences of the scarcity in the short run, but will do it in the long run as the contraction in the supply of labor reduces the level of output affecting the entire economy. Despite the illusion of a trade off, there is none. The poor will be worse off in the long

run if the attempt to achieve equilibrium in a non-Walrasian system fails.

## V. Extending Rationing to Money-Saving, Time-Using Goods

Thus far, the analysis focused on the rationing of the most relatively time-saving goods. In practice, rationing was imposed simultaneously to time-intensive, money-saving goods. The difference is that in the former group, shortages were so severe, that entire categories of goods and services disappeared from the markets for years (some forever) and were never really subject to a formal rationing system. During the seventies, some consumer durable goods started to reappear, but were distributed through trade unions and other organizations as prizes (in recognition for some socialist deed, including labor-related issues) or on the basis of need. Despite this primitive allocation system, the buyer still had to pay with money for the purchase.

Figure 2 depicts an additional rationing constraint represented by the inequality  $x_1 \leq Q_1$ . Now the consumer choice set is further reduced to the rectangle  $OQ_1HQ_2$ , with the corresponding level of utility  $U_4$ , representing an additional welfare loss.<sup>9</sup> Notice that without the quota  $Q_2$ , the worker-consumer in this situation would find himself with an insufficiency of money and an excess of time to be able to maximize utility at point M (the corresponding indifference curve is not shown for clarity but it corresponds to a level of utility between  $U_1$  and  $U_2$ ). Point M represents an incentive to exchange time for a little more money in the labor market. In fact, this would have been an attractive option if the Cuban government's policy intended to stimulate the supply of labor in behalf of the economic development of the country. The government, on the contrary, maintained a much more severe constraint on time-savings goods and workers did not have any incentive to save the unspent income. Many seemed to have reasoned that it was not worth the effort to put the unspent money in the bank for a rainy day because there were no guarantees that the government would not confiscate it. Besides, the official propaganda was categorical in dismissing the value of money following Marxist dogma and the communist utopia of its eventual disappearance.

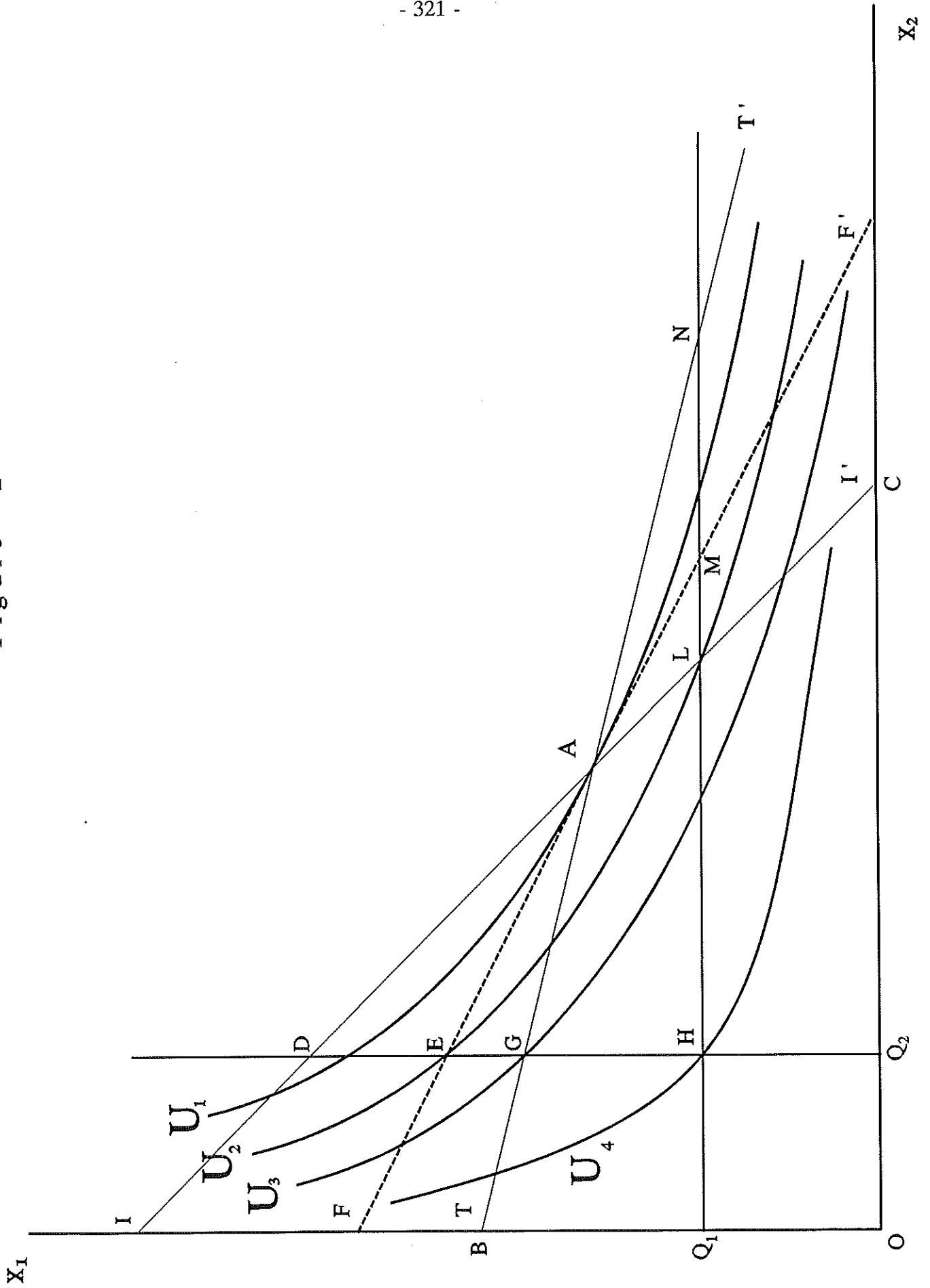
The black market, on the other hand, represented an incentive to earn a certain amount of income, but it would be very difficult, perhaps impossible, to determine whether such an incentive was strong enough. It seems that black market transactions were never as widespread and intense as to represent a major factor in the allocation of time by individuals, especially because black market transactions were almost exclusively limited to foodstuffs and were always severely persecuted by the government. Though a certain level of black market activity would place the consumer somewhere, but not too far, Northeast of point H (Figure 2), we can take H as a point of departure to approximate a measure of the loss of resources that rationing came to represent. Assuming that the worker-consumer remains at point A in terms of his allocation of time between work and consumption and leisure, his idle income (or contribution to the monetary overhang) has now increased to  $HD/p_1$  (minus any possible black market expense), while  $HN/t_2$  is the time "overhang" or total waste, which would include the time of searching for black market opportunities or, most importantly, the time waiting in lines.

Figure 2 shows the two major dimensions of waste imposed on the Cuban economy for thirty years of rationing. The first is that time wasted can be measured in terms of foregone earnings, in terms of foregone human capital investment opportunities, or foregone consumption and leisurely activities. The second dimension, money, measures the amount of resources presumably produced but dedicated to activities over which the consumer had no control or even knowledge, a great

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<sup>9</sup>The metric equivalences conveyed by the graphic are not realistic. Any lack of proportion was necessary for clarity.

Figure 2



difference from explicit taxation. Even if the loss of income to the worker-consumer under this model was well-spent in infrastructure, public education, and health, the result seems to have been a contraction of the supply of labor of such magnitude that the negative impact on the levels of output affected the economy's capacity to fulfill the quotas of rationing.

Until recently, this mechanism was not easy to observe since Cuba enjoyed significant subsidies from the Soviet Union. Those subsidies were in fact necessary to maintain the Cuban economy afloat and save her from her chronic disequilibrium. With the demise of the Soviet Union and the gradual but fast disappearance of the subsidies, the nakedness of the Cuban economic system has become increasingly visible.

Now the government is trying a bizarre strategy, not only from an orthodox Marxist point of view but from many others: the importation of foreign capital in a desperate attempt to stop its continuing decline. Although the initiative to attract foreign investors started in the mid eighties, the efforts have been intensified in the last few years for the reasons just mentioned. Interestingly, capital is not the only thing that the government wants, but also managerial capabilities that the central planning system and the government enterprises have failed to provide. To achieve this, labor practices have been radically changed for those working in foreign enterprises, mainly dedicated to international tourism. Whether this policy will be able to take the Cuban economy out of its current predicament is also an open question. In the meantime, the rest of the economy appears to continue a slow process of deterioration, now with increasing unemployment, physical decay of infrastructure, and increasing signals of labor dissatisfaction.

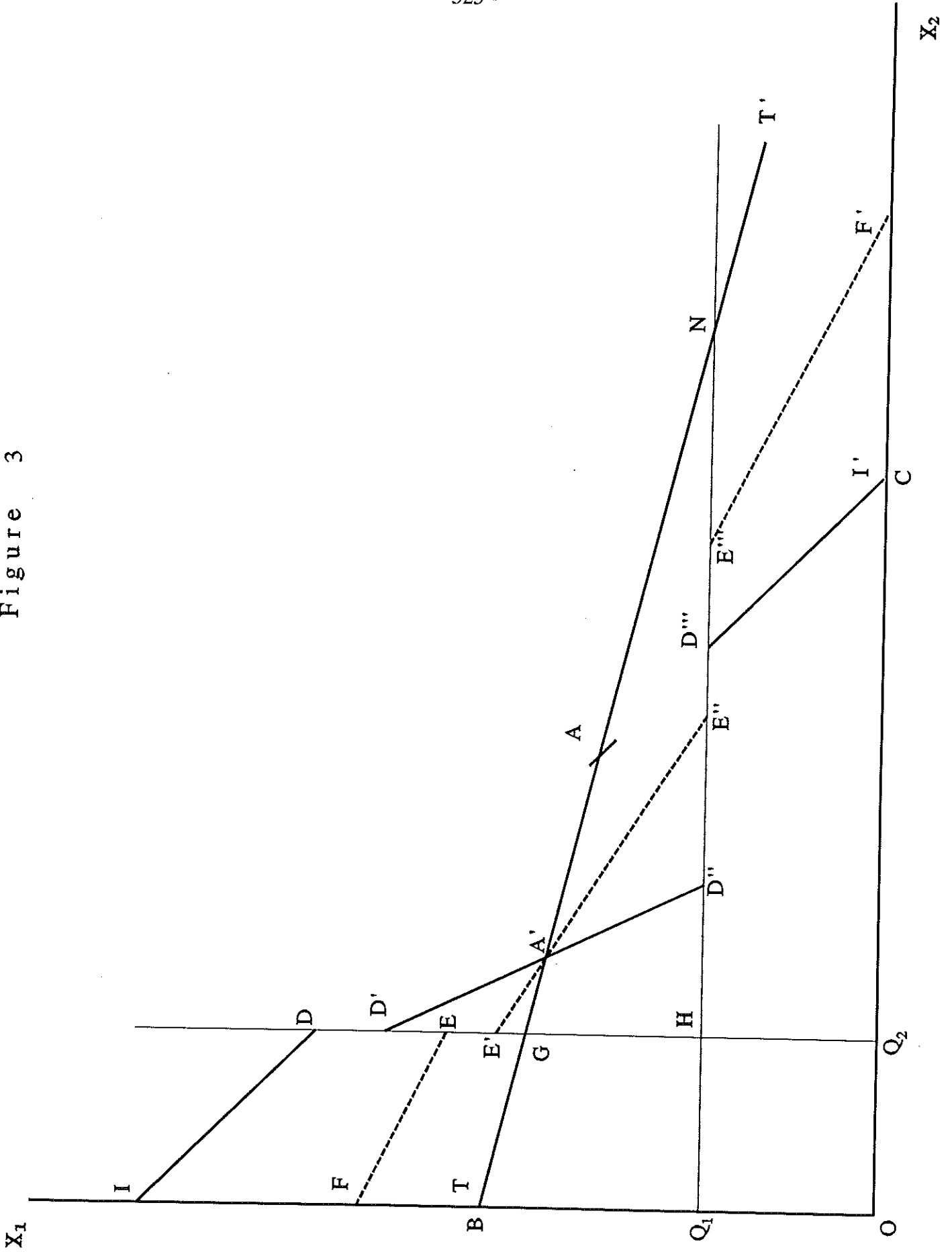
## VI. The Path Toward Recovery

As the productive capacity shrinks on all fronts, one wonders about how fast the Cuban economy can recover from the current quagmire. It seems that Cuba's economy has suffered losses on a number of areas, for instance, physical assets and general infrastructure, markets, know-how, workers' attitudes, international credit, etc. But the most difficult aspect of its recovery will be changing the organization of the economic system, and with that, the development of a new legal system, the emergence of competitive entrepreneurs, and the formulation and implementation of an economic recovery program. The challenge goes well beyond that of simple policy definitions. Among the most critical problems will be how to move from the current system of rationing, fixed prices, bureaucratic enterprises, and central planning, to a system of price flexibility and private initiatives.

Figure 3 may help visualize the magnitude of this problem. The figure is a simplified version of Figure 2 with some minor but critical changes. The rationing constraints at  $Q_1$  and  $Q_2$  are kept and in fact divide the graphic in a special way. The areas to the West of  $Q_2$  and to the South of  $Q_1$  represent the past of frozen nominal prices. Once rationing is eliminated, the reality will look as the quadrant North East of H. As the economy deteriorated, both internally and in its ability to attract foreign currency, prices increased *pari passu* in real terms and the income budget constraint collapsed accordingly. This is not evident to the general public until they are allowed to operate again without the rationing restrictions, i.e., to the East of  $Q_2$  and North of  $Q_1$ .

The old constraint  $II'$  is missing its center  $D'D''$ , and it shows a different slope as relative prices are expected to change with a negative bias against imported goods that tend to be more time saving than domestic ones. Concomitantly, the full-income constraint also collapses in the middle, represented by the segment  $E'E''$ . The time constraint could be assumed to remain intact if the

Figure 3



values of the  $t_{ij}$  do not change in relative or absolute terms. Nevertheless, there is room for conjecture in this regard, since the regression of the Cuban economy may have affected the levels of efficiency of the uses of time. In other words, if there have been fundamental changes in the "technologies" of household production functions, then the North East segment of the time constraint  $TT'$  also collapses.

The figure shows that the old equilibrium position at A is not attainable, but there is an improvement in moving from H to A' (or its equivalent for a lower  $TT'$ ). Under these conditions, a radical price liberalization seems the most natural measure to adopt since it would improve consumers' welfare allowing them to buy beyond their old rations, and also would stimulate the labor supply. Then, why is price liberalization so much feared in societies that became liberated recently from central planning? One answer depends on the pattern of distribution of income in combination with the sources of income. Those living on fixed incomes would definitely suffer, since many of those who have more income than the necessary to purchase the old rationing quotas can afford the new prices and buy greater quantities than before. Also, those making a living in activities that do not produce the goods in high demand (government servants, military) will fear the movement, because their salaries cannot be liberalized consistently with the rest of the economy. Another answer is based on the expectation that price increases will be abusive, well beyond competitive equilibrium levels. The reason for this is that if price liberalization takes place before government enterprises are privatized or forced to behave competitively, they will abuse their monopolistic or quasi-monopolistic positions.

None of the arguments are compelling enough to impede the liberalization of prices at one point in time, the sooner the better. Nevertheless, the process should be engineered in a way that takes care of all the necessary adjustment at the same time. The problem cannot be solved by the stroke of a pen; it also requires designing and implementing a complex program to dismantle the system without generating unnecessary suffering to the population.

## VII. Conclusion

One of the main conclusions of this paper is that Cubans appear to behave as utility maximizers. This is despite government efforts to make them work without material incentives but on ideological motivation alone. Utility-maximizing behavior is revealed as Cubans continue exercising free choice about the only resource they still own: time. By allocating their time consistently with their own interests, Cuban workers have contributed to the economic stagnation, and even regression of the country. This is the result of the government failure to create an economic system capable of making individual interests compatible with the common good. This demonstrates that an economic system that systematically ignores the fundamentals of human behavior is doomed to fail.

Another fundamental conclusion of the paper is that Cuban worker-consumers may be ready to react to a new and more liberal price mechanism. As consumers, no one doubts that they would know how to allocate their time and money budgets to obtain the most satisfying combination of goods. As workers, they can be expected to be equally sensitive to the signals of free labor markets. Nevertheless, when the transition to a market economy becomes a possibility in Cuba, not all economic agents will be as well prepared to respond to market signals as consumers and workers. The latter are already in control of their preferences, their labor services, their time, and their human capital. That part of the economy is already private. But the enterprises that must continue producing the goods the consumers purchase, and hiring the workers who produce them will not be

prepared to react efficiently to market signals until some profound changes are introduced. This fundamental asymmetry about price responsiveness by different economic agents in a transitional economy must be recognized and dealt with before any price liberalization plan is implemented.

The Cuban economy is a study in anomalies and disequilibria. As in other branches of science, these extreme phenomena offer fresh opportunities for theoretical research and better understanding of all the elements that make an economic system work, especially market economies. Too often, we take for granted many of those elements as we get used to study well-structured economic systems in the Western tradition. Alternatively, we become too involved with aggregate economic analysis and its corresponding functional relationships, or simply too focused in some narrow areas of interest. As we study the Cuban economy, it is almost impossible not to feel the obligation to adopt a systemic approach, i.e., everything matters. This happens as soon as one becomes interested in how a transition from central planning to a market economy should be designed and implemented.

To prepare for the transition to a market economy, the importance of understanding the workings of the centrally planned system cannot be exaggerated. A new economic system cannot be changed by policy declarations or by decree. There is the need to design and build new institutions and develop new mentalities. The effort goes well beyond the typical design and implementation of economic policies. In the socialist revolution, the process consisted of a reduction of the institutional complexity of the economy. Enterprises were concentrated into monopolies as they were confiscated. Entire sectors and activities disappeared, like banking, insurance, advertising and free markets. Property rights were either eliminated or severely limited; the legal system was radically transformed. Whole generations have been educated in the new system, with little or no knowledge of alternative economic regimes and opportunities. Their understanding of market economics is flawed by preconceptions about the role of interest rates, all forms of intermediation, property rights, risk, and the role of the government in economies.

The process from central planning to free markets proceeds inversely; from a state of low institutional complexity to one of higher complexity. It is one characterized by hysteresis, which implies that a much more sophisticated strategy is required. The socialist destruction of property rights and financial intermediation requires building these institutions anew, as well as a legal system and even a constitutional framework. Perceptions or mentalities that make people willing to accept or oppose fundamental changes in their societies is also a dimension of the transition that must be dealt with from the beginning of the process. If the future builders of the transition in Cuba understand all these factors, they would be avoiding the simplemindedness of adopting extreme positions like "shock therapy" or "gradualism". The fact is that some public policy measures will require quick, even drastic decisions. Many others will require more than just decisions. The real challenge is to gather the wisdom to design new institutions and the patience to construct them and make them work.

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