Selective Use of Discretionary Public Employment and Economic Flexibility

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Flexibility is a desirable feature of an economic system. Structural rigidities can result in sluggish growth and inflationary pressures. Many economic models, however, display considerable system flexibility because of the use of unacceptably unrealistic assumptions. The primary 'real-life' features endowing the system with flexibility are unemployment and excess capacity. While realistic, unemployment is economically costly and socially undesirable. In economic theory, there appears to be a trade-off between flexibility and realism. In reality, there appears to be a trade-off between flexibility and full employment. What has not been adequately recognized, however, is the degree to which policies are available that can promote higher levels of employment--and even full employment--without resulting in deleterious rigidity.

The Importance of Flexibility

The term 'flexibility' has become something of a buzzword. It is often used in different ways and its meaning can be unclear.[1] Flexibility here refers primarily to the elasticity of the production system, the adaptability of the production system in the face of structural and technological changes, such as capital- or labor-saving technical innovations, changes in labor supply or the supply of natural resources, and changes in the composition of final demand. A viscous system will have trouble adapting quickly to such changes and thus may be characterized by bottlenecks in production, sluggish growth, inflationary pressures, significant structural, frictional, and technological unemployment, and stretches of underutilization of plant and equipment. Conversely, the more elastic the production system, the better the system is able to respond to structural and technical change without resulting in structural rigidities. Such a climate is more conducive to high employment economic growth without inflation.

An investigation of the conditions and policies promoting full employment and non-inflationary growth must therefore be concerned with factors determining the elasticity of the production system. Two main distinctions among factors endowing the system with flexibility must be made. First, in the models that inform policy analysis, the distinction must be made between realistic and unrealistic factors that provide system flexibility.[2] Models that include unrealistic assumptions giving the system more flexibility than it would otherwise possess provide a misleading depiction of the economic system upon which to base policy. Second, among those factors providing flexibility that are deemed realistic the distinction must be made between those that are economically and socially acceptable and those that are not. In particular, unemployment and excess capacity generally may endow the system with an elasticity that comes at an unacceptably high social and economic cost. Likewise, deregulation of, or a *laissez-faire* attitude toward, 'dirty' technologies may result in some flexibility, but may harm the environment and human health.

The Unreality of Flexibility in Standard Economic Models

A number of assumptions in standard economic models that endow the productive system with flexibility appear to be quite unrealistic. Their usefulness for understanding current economic challenges and formulating effective policies are thus quite limited. It will be useful to catalogue these unacceptable assumptions as a prelude to a discussion of flexibility and rigidity in actual economic systems.

The flexibility of the production system is ensured in standard neoclassical theory by a whole host of assumptions. Interestingly, the same basic set of assumptions that are purported in the neoclassical view to guarantee an inherent tendency *to* full employment also guarantee perfect

flexibility of the system *at* full employment. Prices (including factor prices) are fully flexible, and prices correctly convey information that economic agents with full knowledge instantaneously respond to in pre-determined ways. Factors of production are perfectly mobile, perfectly divisible, perfectly substitutable, and homogeneous. The principle of substitution likewise dominates the analysis of consumer behavior. There is no uncertainty or historical time. Thus the system instantaneously and easily adjusts to structural and technological change. The production system, even at full employment of all resources, is fully flexible. As Basu has remarked, "In standard neoclassical models, flexibility is unimportant because it is total"(1995, p. 64).[3]

Models in which commodities may be used as either capital goods or consumption goods will exhibit an unrealistically high degree of flexibility (e.g., Solow, 1967). Adjustments come easily, as a reduction of consumption *is* an increased capital stock (Amendola and Gaffard, 1988, p. 26).[4] An initial rigidity is therefore introduced when this assumption is relaxed and a distinction is made between consumption goods and capital goods (Gehrke, 1997, p. 211).

As long as capital goods are still assumed to be homogeneous, however, the system will still display an unrealistically high degree of flexibility, as in a Hicks (1965) tractor and corn model where tractors and labor combined in different proportions produce both tractors and corn. In this case, capital goods cannot be increased simply by reducing consumption, but means of production can be moved freely between the two sectors and thus "the fundamental 'adjustment mechanism' does not have to change drastically" (Gehrke, 1997, p. 211; cf. Amendola and Gaffard, 1988, p. 27).

Finally, for present purposes, the exclusion of natural resources or the assumptions of free and/or unlimited natural resources and/or free waste disposal (as in, among other approaches, von

Neumann type models and activity analysis) also abstract from increasingly significant issues with implications for production decisions, choice of technique, and system flexibility and rigidity. Increasing concern with the sustainability of particular technological decisions and the environmental impact of specific productive activities and technologies means such assumptions disregard the potential importance of these present and future constraints. They may therefore depict adjustment as free of these types of hitches and so as unrealistically smooth.

The significant flexibility or elasticity of the production system depicted in many standard models comes at the cost of unrealistic assumptions. These models thus serve as a weak basis for economic analysis and public policy, particularly as relates to these very issues of the rigidity or flexibility of the system. One commodity models, models with non-specific capital goods, models with perfect information, models conducted in notional or logical time, models with perfectly divisible, mobile, substitutable, and homogeneous factors of production will all exhibit an unrealistically high degree of flexibility. Analysis of adjustment processes crucial to economic growth and macroeconomic problems of unemployment and inflation based on these kinds of models will therefore be of limited use.

Flexibility at What Cost?: Unemployment and Excess Capacity

An important 'real-life' factor endowing the system with flexibility appears to be unemployment and excess capacity generally. Capitalist systems gain flexibility by sacrificing full employment. Excess capacity and labor unemployment are reproduced in a differing manner, however, and have different social and human costs and structural implications.

Competition necessitates that firms be prepared to capture new sales should such opportunities arise. If there is an unexpected increase in demand firms that want to capture some

of the potential sales must be able to increase output without having to build new capital equipment that takes considerable time (Steindl, 1954). Thus firms plan reserve capacity. They build above and beyond the scale required to meet normal expected demand, so they can meet peak and unexpected demand. This is planned excess capacity, in excess of the capacity associated with the normal operating level. Firms that are unable to respond to new opportunities for higher sales will lose out to firms that are prepared. Every firm, however, will not be successful in capturing the new sales, even if they all carry reserve capacity. This means that reserve capacity at the firm level translates into excess capacity at the industry and economy-wide levels (Nell, 1991).

Excess capacity adds to system flexibility. It enables bursts of capital accumulation to take place that otherwise would be foregone due to structural rigidities that result in production bottlenecks. Bottlenecks in key industries, such as the machine-tools industries, can cause economy-wide disruptions and prevent smooth expansion. The system requires flexibility.

While individual firms can plan reserve capacity when making decisions concerning the scale of plant and equipment, they cannot (with some exceptions) maintain laborers on the payroll who will not be required when operating at normal capacity. But the ability to respond requires not only reserve capacity in terms of capital equipment, it also requires the ability to hire additional workers to add on production lines or work additional shifts. Capitalism has historically reproduced reserve pools of labor at the system-wide level rather than at the firm level.

Reserve pools of labor have historically served several purposes. Most of these fall under the categories of flexibility and stability. A reserve army of unemployed helps hold down wages by weakening the bargaining position of labor. The reserve army increases system flexibility by

providing a pool of labor from which firms can draw during expansions. It has also been argued that the reserve army of unemployed serves to discipline workers (Kalecki, 1943; Stiglitz and Shapiro, 1984).

Different explanations have been offered concerning how the reserve army is reproduced at the system level. Marx and others root the reproduction of the reserve army in endogenous technical change. As accumulation takes place, the reserve army shrinks, pushing up wages and cutting into capitalists' profits. Competition forces firms to introduce labor-saving technologies, displacing workers and causing the reserve army to expand, taking the pressure off wages. The efficiency wage hypothesis posits wages above the equilibrium level resulting in neoclassical unemployment. Alternative views include the maintenance of unemployment by political means (Kalecki, 1943; Boddy and Crotty, 1975).

Unemployment and excess capacity are important sources of system flexibility in real economic systems. This flexibility, however, comes at a high social and economic cost. Enforcing some target rate of unemployment through, for example, tightening monetary policy and/or a tight fiscal stance, assigns workers and their families to poverty and/or other forms of assistance. In taking such a position central banks, national governments, and international organizations betray the commitment to full employment made by many countries in the post-WWII period and embodied in their own legislation as well as a number of proclamations of the United Nations supporting the right to work as a fundamental human right (Harvey, 1989).

In addition to the ethical and legal obligation of countries to promote full employment, the direct and indirect social and economic costs of unemployment have been shown to be unacceptably high. Unemployment causes permanent losses in potential output of goods and services; losses of tax revenues; higher government spending in the form of various types of

assistance; economic, social, psychological and other problems resulting in crime, ill health (physical and mental), divorce, suicide, etc.; deterioration of labor skills and productivity; and more (see, e.g., Jahoda, 1982; Kelvin and Jarrett, 1985). The argument that full employment is key to social stability may also be included here. Quite simply, a compelling argument can be made that the benefits of full employment outweigh the costs of its achievement, and that unemployment, rather than inflation, ought to be viewed as 'Public Enemy Number One' (see, e.g., Hughes and Perlman, 1984; Dawson, 1992; Moosa, 1997; Piachaud, 1997).

Flexibility cannot be achieved through assumptions that have no basis in real economic systems. Flexibility should not be achieved through the enforcement of unemployment. It will be useful then to examine a simple model that rejects the idealizations of standard analysis and at the same time takes full employment as a stipulated macroeconomic goal. The question of whether full capacity utilization should be an additional economic goal or could be realized if it were also stipulated will remain open for now, but the model will include full capacity utilization as an additional requirement. Thus the model will explore the conditions under which full employment and full capacity may be maintained in the face of structural and technological change.

Structural Analysis and System Rigidity

Rejection of the assumptions of standard analysis results in a very different depiction of the production system. Capital goods are highly specific and in no way necessarily shiftable between different lines of production. Means of production are not highly divisible or substitutable, if at all. Economic processes take place in historical time; there are no instantaneous adjustments. There is a significant amount of uncertainty regarding the future, and the past is unchangeable.

Modern economies are interindustry system, with complex sectoral interdependencies such as are described in input-output analyses. Even analyses that are not as disaggregated as input-output models, however, can highlight the sectoral interdependence and interindustry linkages and their implications. Here, Lowe's (1952; 1955; 1976) three-sector model will be employed to highlight the physical and technical nature of the sectoral relations and their implications for the analysis of structural rigidity in the face of structural and technological change.

Lowe's model, while fundamentally of the 'horizontally-integrated' variety, contains an important element of vertical integration as well. It begins with a technical sequence of production depicting working capital moving through a series of successive stages *en route* to becoming final output. For example, we can follow working capital through a series of transformations, such as cotton-yarn-cloth-dress in dress production or wheat-flour-bread in the production of bread. At each stage, labor (N_i), fixed capital (F_i), and natural resources (R_i), combine to produce the working capital (w_i) as output:

$N_1 \cup F_1 \cup R_1$ -> w_1 = cotton

$N_2 \cup F_2 \cup R_2 \cup w_1$ -> w_2 = yarn

$N_3 \cup F_3 \cup R_3 \cup w_2$ -> w_3 = cloth

$N_4 \cup F_4 \cup R_4 \cup w_3$ -> w_4 = dress

Capital letters indicate stocks, lower case indicate flows. Output at the last stage is a final good.

It is clear that at every stage except the first, the working capital which was the output of the previous period, w_{i-1} is also an input. In this picture, working capital appears as depicted in the 'Austrian' linear view: the process can be traced back from the final output through each

intermediate stage to an initial stage in which no working capital had been taken over from a previous stage. The picture, however, as thus far presented, does not explain the origin of the fixed capital. In addition, mere accounting for the origin of fixed capital would only suffice to guarantee temporary provision; permanency or continuity of production requires the ongoing replenishment of stocks undergoing wear and tear in the production process and thus a second sector in which fixed capital equipment is produced and reproduced.

Thus if F_1 through F_4 are identified as gin-spindle-loom-sewing machine, a technical sequence of production of several stages may be derived for each, similar in structure to that of dress production, but with inputs of a nature appropriate for the production of the equipment good at hand as final output. The weakness of this 'solution' is immediately revealed, as another production flow will now be required to account for the production of the fixed capital used to produce each of gin-spindle-loom-sewing machine.

Fortunately, the analysis is not mired in an infinite regress, as capital goods are not homogeneous, but they are not perfectly heterogeneous either. Lowe identifies 'machine tools' as capital goods utilized in their own production. Thus, it is sufficient to divide the capital goods sector into Sectors 1 and 2, producing means of production utilized in capital goods production (Sectors 1 and 2 combined) and consumption goods production (Sector 3) respectively. The resulting three-sector model may be used to highlight the obstacles to maintaining full employment and full capacity utilization in the face of structural and technological change.

The three-sector horizontally-integrated model reveals the relations between the two capital goods sectors and the consumption goods sector:

Sector 1 $n_a \cup f_a \cup r_a \rightarrow a$

Sector 2 $n_b \cup f_b \cup r_b \rightarrow b$

Sector 3 $n_z \cup f_z \cup r_z \rightarrow z$

where $f_i = d_i F_i$, i.e., the flow magnitude of the fixed capital input in each sector per period is equal to the depreciation of the stock of fixed capital in that sector per period. a, b, and z are the output flows in sector 1, 2, and 3, respectively. System reproduction requires that the following conditions be met:

$$a \geq f_a + f_b$$

$$b \geq f_z$$

$$z \geq n_a + n_b + n_z$$

Output in Sector 1 must at least replace the fixed capital used up in Sectors 1 and 2, output in Sector 2 must at least replace the fixed capital used up in Sector 3, and output in Sector 3-- treating labor power in a circular manner as in the 'Classical' view-- must provide adequate means of subsistence for the reproduction of labor power in all three sectors. When the equality holds in all three above conditions, the system is in a stationary state. Even continued simple reproduction must assume the availability of the necessary natural resources and their successful extraction and processing.

The simple three sector model highlights, among other things, the structural conditions for steady growth and the traverse from one growth path to another. Assuming no technical change and a labor supply growing at rate exactly sufficient to utilize the means of production, the allocation of total output in the machine tools sector (Sector 1) between itself and Sector 2 determines the path of economic growth.

To produce consumption goods at a rate greater than that enabled by a given steady rate of growth, the capacity of Sector 3 must grow faster. For the capacity of Sector 3 to grow faster, the capacity of Sector 2 must grow faster. A quicker increase in the capacity of Sector 2 and thus Sector 3 may be achieved through "'cannibalization' of capital stocks", i.e., reducing the proportion of total output in Sector 1 allocated to itself (Lowe, 1976, p. 110). The capacity of Sector 2 will be immediately increased, but it will be followed by a decline in the rate of growth. Alternatively, the proportion of total output of Sector 1 allocated to itself could be increased, initially reducing the rate of growth of output in Sector 3, but eventually shifting the economy to a higher growth path through a long run strategy of building capacity in Sector 2. In the course of the traverse from the initial steady state to the new higher rate, the absolute levels of output of consumption goods will be lower than they would have been otherwise (if the economy had maintained its level of expansion at the old rate corresponding to the initial allocation of total output in Sector 1 between itself and Sector 2).

In the preceding, it was assumed for purposes of exposition that the labor supply adjusted at exactly the rate required to fully utilize the capital stock. It should be clear that the results achieved imply that should the tables now be turned and the question becomes that of maintaining full employment in the face of an exogenous increase in the rate of growth of labor supply, a transformation in the structure of real capital will be required. Specifically, with fixed coefficients of production and the stipulated requirement of full resource utilization and steady growth, the only way to increase production in Sector 3 will be through a "partial liberation of existing capacity" that requires a temporary fall in the growth rate of output in that Sector (*ibid.*). This is because, as has already been seen, expansion of production in the consumer goods sector requires

increased production in Sector 2. The only way that this can be achieved and also traverse the path to the new higher rate of growth associated with the new higher rate of growth of labor supply is to reallocate a greater proportion of output of Sector 1 away from Sector 2 and toward itself. Again, "the rate of replacement and expansion of secondary equipment must fall, with the paradoxical result that, in order ultimately to *increase* the output of consumer goods, such output must, to begin with, be *reduced*"(*ibid.*).

The structural-technological conditions for maintaining full employment and full capacity utilization in the face of labor- and capital-displacing technological changes will be analogous to the case of an increase in the rate of growth of labor supply. The clear result of the analysis is that the primary obstacle to an economy running at full capacity utilization and full employment in adapting to unexpected changes in the supply of labor or natural resources, or technological change, is the inadequacy of the structure of its stock of real capital. "[T]he root of all these difficulties is *technological*":

> Obstruction of resource shifts, bottlenecks in production, inelasticity of supply owing to the *longue durée* of capital formation and even more to the large costs of sunk capital, these and most other impediments to smooth expansion are the effect of the large size and the technical specificity of inputs.(Lowe, 1976, p. 9).

Recognition of these physical bottlenecks, rigidities, distortions, and timelags as characteristic of the production system brings to center stage of structural analysis issues related to the "*formation, application, and liquidation of real capital*" (Lowe, 1976, p. 10).

Furthermore, an additional constraint on the production system is given by those processes that utilize non-renewable natural resources, or that produce waste of a quality or quantity exceeding the assimilative capabilities of the environment. Some of these constraints may be understood in relation to societal values, while others may be altered due to technological change.

In addition, the recycling of production residuals is easily considered within the framework, introducing a certain 'circularity' to natural resources as well. Nevertheless, even with these qualifications, the impact of these factors on the flexibility of the system must be considered.

Further Factors Impacting Flexibility

Standard neoclassical theory puts forward an idealized economy where methods of production and factor supplies instantly respond to demand that changes when relative factor prices change. It often assumes a one-commodity world, or homogeneous capital goods. Structural analysis highlights the impediments to rapid adjustment, the structural disequilibria, the disproportionalities, and the physical-technical consistency conditions for system viability (reproduction) that especially confront an economy brought to full employment by, e.g., Keynesian demand management. In neoclassical theory there is a trade-off between flexibility and reality; in structural analysis there is a trade-off between flexibility and full employment of resources.

Before turning to policies that might promote a flexible full employment, mention should be made of several other factors that can lend flexibility to the system.

1) IMPORTS. For any country, bottlenecks in the supply of capital goods or natural resources might be relieved through importing (Worswick, 1944; Kurz, 1990; Gehrke, 1997). This can occur through either direct importation of the needed goods, or the importing of the goods needed to increase domestic production. Of course, such a solution is limited by a number of factors, and is not available for the global system as a whole.

2) SHIFT WORK. Additional shifts may be instituted, up to the point where

production is ongoing (Lowe, 1976; Kurz, 1990; Gehrke, 1997). This is limited by a number of factors, including the issue of the time-specificity of some input prices (Kurz, 1990). Increasing shifts is also impossible for those firms already engaged in 24 hour production. It is also not viable for an economy operating at full employment of labor without an increase in the labor supply, or without bidding some workers away from other employment. The latter point also means that the 'solution' is zero-sum for the system as a whole.

3) INTENSIFICATION OF PRODUCTION. Various means may be used to try to intensify production (Lowe, 1976; Kurz, 1990; Gehrke, 1997). Intensification has its limits, however, and can result in sloppy work or accidents.

4) RUNNING DOWN INVENTORIES. Of course, to the extent they are available inventories can be run down (Worswick, 1944; Kurz, 1990; Gehrke, 1997). This is a temporary solution, but that can sometimes be enough to avoid a bottleneck.

5) OVERTIME. Overtime can be used (Worswick, 1944; Kurz, 1990). Here again the problem with using overtime is the impact is has on costs.

6) POSTPONING THE SCRAPPING OF EQUIPMENT OR REACTIVATING EQUIPMENT NOT YET SCRAPPED BUT NO LONGER IN USE. Equipment is often scrapped when it still has some productive potential remaining, and often equipment is deactivated before it is actually scrapped (Gehrke, 1997). Thus, more can be squeezed from such equipment, extending production possibilities.

Some or all of the above may be utilized by some firms to extend the elasticity of supply. Some of these solutions may be short-term, some not available, some available only at increasing costs, some never available to an economy operating at full employment, some of a positive yet

limited effect. Importantly, the system is ultimately limited by the least flexible industry. In other words, it only takes one necessary input in short supply to make a bottleneck.

In addition, a number of these factors will result in the increase of replacement requirements, thus opening the way for further bottlenecks down the road. Nevertheless, some of these and other factors do give some additional flexibility or potential flexibility to the production system—even one operating at full employment.

In the three sector model, full employment of labor and full capacity utilization were stipulated in order to exhibit the structural rigidities that characterize such a system. While there are policies to promote full employment of labor, it is not clear what policies would ensure full capacity utilization. Given the desire for flexibility at the plant or firm level, the system would likely still reproduce some excess capacity even absent political enforcement policies (the system would not tend to full capacity utilization just because central banks, national governments, or international agencies suddenly stopped promoting slack). It is not even clear that, despite the potentially negative consequences, true full capacity utilization would be desirable.

Full employment of labor, however, is both possible and desirable. The problem has been how to maintain the system flexibility and stability that unemployment helps ensure, without the social and economic costs of unemployment. Selective use of discretionary public employment stands out as a viable means of reconciling the contradiction between full employment and flexibility.

Toward A Flexible Full Employment

Public sector employment has a number of advantages over other approaches in promoting a flexible full employment. These advantages include those that relate to not only labor, but to

capital goods and natural resources as well. They relate to both the input side and the output side of public sector activity. And they regard decisions concerning both the types of activities the public sector engages in and the methods of production the public sector utilizes in its activities. In many cases, they also regard the geographic location of those activities, key to minimizing human dislocation.

Key to understanding the flexibility of public sector activity is to understand the constraints within which private firms operate. Competitive pressures compel private firms to make decisions based on a narrow set of criteria. Firms must make decisions concerning what activities to engage in and what methods of production to utilize based on their best estimate of the profitability of such a move or decision. Of course, there are a number of issues that come into play here, and we would not want to depict these decisions as simplistic. But in a capitalist economy competitive pressures greatly restrict the degree of discretion that firms have with regard to the line of production they engage in and the methods of production they utilize in any given line of production.

Public sector activity, however, does not have to be concerned with these types of competitive pressures, since government is not in business to make a profit. Government can choose to engage in a line of production that no private firm would engage in. Likewise, the public sector can choose to utilize a method of production that may be different from the method that would be chosen if the decision were based exclusively on narrow 'efficiency' criteria, where efficiency is defined as private cost minimization. Government can make its decisions based on other criteria, such as an assessment of broader macroeconomic concerns or social values. By making its decisions on such alternative criteria, government can positively impact the private sector in a

number of ways.

We have seen that full employment of all resources in the private sector is only sustainable in an unrealistically flexible system that does not represent the economy in which we actually live. Unemployment and excess capacity therefore serve to provide the system with the flexibility that permits structural adjustments, sectoral shifts, and low inflation. Used strategically, however, public sector employment and public sector activity can promote flexibility without the high social and economic costs of unemployment.

Key to the policy approach is the distinction between "necessary," (essential, or regular) public sector activity and employment and what we call here "discretionary" public sector activity and employment. Of course, what is "necessary" and what is not is a matter of social policy and also may change over time, but at any given time there are a set of activities which are considered necessary and which cannot be modified, delayed, or discontinued without harm to the public good. The employees that are engaged in the operation and management of these necessary functions are necessary or regular (i.e., permanent) public sector employees, are paid "at market" and are not part of what is termed "discretionary" public employment.

Designation of employment or activities as "discretionary" does not mean that they provide no public benefit. It means, in essence, that for the time being they are something that society could use or benefit from but could do without, at least for a time. There is no "emergency" character to them, so to speak. Thus, these activities can be undertaken when there is available labor from the private sector, and they can be delayed or discontinued when private sector demand for labor rises. Of course, some functions that are in the "discretionary" category may be re-designated as "necessary" under changing circumstances. Likewise, some public sector activities may be taken

up by the private sector.

1. Labor

The benefits of discretionary public sector employment in promoting flexibility with regard to labor has been perhaps the most emphasized in other literature on the subject.[5] Here the discretionary public sector workers are seen as continuing to function as a 'reserve army,' only one that is employed at a living wage. Thus, the discretionary public sector workers continue to be available to the private sector if the demand for labor should increase. Firms need only bid the public sector workers away by offering them a mark-up over the basic public sector wage, or better benefits, or an opportunity at career advancement, or any other incentive to move into the private sector.

As the private sector demand for labor increases, the discretionary public sector pool will presumably shrink, and as the private sector demand for labor falls, the discretionary public sector pool will presumably rise. The mechanism thus works something like the 'reserve army,' but with workers moving between private sector and public sector employment rather than between employment and unemployment. We thus have full employment, without overly tight labor markets.

By 'employing the reserve army,' workers who would have been otherwise unemployed can have the opportunity to maintain and enhance their skill and knowledge level, thus providing benefits to the individual workers and the economy as a whole. Increasing skills may lead to higher functional flexibility in the economy, while discretionary public sector employment provides numerical flexibility without relying on unemployment.

Labor market rigidities result from full employment. With guaranteed public sector employment, an element of labor market flexibility is retained without unemployment. Thus firms can maintain a certain flexibility resulting from numerical flexibility, and so add shifts or add workers to production lines, extending elasticity of supply in the firm, and thus to the industry and system as a whole.

2. Capital Goods

Unemployment of capital goods does not have the same social costs as labor unemployment. Thus it is not necessary to be concerned with idle capital in the same sense as labor unemployment. Schemes that promote increases in labor employment by stimulating private sector activity will also result in higher degrees of capacity utilization in those industries that experience a higher demand for their product and those industries that provide their inputs. Thus there is a danger of bottlenecks resulting from higher capacity utilization rates. Such bottlenecks are the source of structural rigidities and inflationary pressures.

Whether the result of higher private sector activity or increased public sector activity, increased demand for capital goods can result in such bottlenecks. In the case of government activity, however, once again government has a greater discretion in choosing which activities to engage in and which methods of production to utilize. Of course, this is for 'discretionary' public sector activity. Again, this does not mean that such activity may not be beneficial to the public, but that public sector activity deemed to be 'essential' is not subject to the same flexibility.

In choosing what productive activities to engage in, government can consider the general trends in the composition of economic activity and make the decision not to engage in activities

that utilize those types of capital equipment that are already in high demand or are in short supply. If the public sector were to engage in activities that utilized such equipment then this could lead to bottlenecks in the same way as higher levels of private sector activity. Since public sector decisions are not driven by competitive pressures, government can simply engage in those activities that utilize equipment for which there is sufficient supply, or where the elasticity of supply is known to be higher. In this way, higher levels of employment of labor are possible with more flexibility than would be the case if the same level of employment were achieved through stimulating demand in the private sector.

There is also the possibility that for some types of capital equipment in short supply at higher levels of economic activity, government could choose to help avoid bottlenecks by increasing productive capacity in that line of production through public sector production. This could entail direct production of the goods in short supply, or the production of the goods required to produce those goods.

It is quite possible for public sector workers to engage in activities that use little or no capital equipment whatsoever, should that be perceived as beneficial in avoiding structural rigidities while promoting full employment. There is a whole spectrum of near pure services that are beneficial to the economy and society, but utilize almost no capital equipment. Much environmental clean up and protection can be conducted with minimal capital equipment, as well as a whole host of other public services. Additional 'helping hands' in schools, on playgrounds, in communities, in hospitals, in subway stations, all can provide beneficial services without resulting in increased utilization of capital equipment.

3. Natural Resources

A similar argument as was made for capital goods can be made for natural resources. Bottlenecks and rigidities can result from pressures on the supply of natural resources, especially non-renewable natural resources. Government can choose to engage in those activities that do not utilize exhaustible resources, or that use them less intensively. Again, this is for "discretionary" activities; obviously for "essential" government services, there is not the same latitude. For basic or discretionary public sector activity, however, there are plenty of socially and economically beneficial services that do not require the use—or the intensive use—of exhaustible natural resources. Thus, bottlenecks due to increased demand for scarce natural resources do not have to result from higher levels of employment.

The same cannot be said for higher levels of employment that come from increased private sector activity. Whether the result of subsidizing wages, or stimulating private sector demand though fiscal and monetary policy, it cannot be claimed that such higher levels of activity will not result in higher or more intensive use of natural resources and that such higher levels of utilization will not result in inflationary pressures and structural rigidities. Government can choose not to use; with the private sector there is no guarantee.

While the supply of exhaustible natural resources cannot be increased through public sector production in the same way that capital goods might, government does have some ability to further alleviate production bottlenecks through its decisions concerning the composition of discretionary public sector activity. Public sector activity may be devoted to developing renewable substitutes for exhaustible natural resources. Public sector activity may also be devoted to increased recycling efforts that can take pressure off of natural resource supply.

Government also may choose to engage in activities that do not pollute or that pollute less. In this way, pressures on the local and global assimilative capacities of the environment can be relieved or avoided. The assimilative capacity may also be thought of as a natural resource and thus while higher levels of private sector activity may increase utilization to an extent that results in a variety of pressures, public sector activity can be geared toward activities that do not tax the assimilative capacity of the environment. And just as in the case of natural resources, the public sector can engage in activities that actually enhance the assimilative capacity.

4. Methods of Production

It is not only through choosing from among alternative projects that government can promote a more flexible full employment, but also by choosing from among alternative methods of production. Whereas private firms are compelled by competitive pressures to choose the profit maximizing method of production, government is not constrained by those same pressures. Thus, for any given activity, choice of technique can be based not on private cost minimization efficiency criteria, but on criteria regarding the impact on the system as a whole.

More labor intensive methods may be utilized, even where more capital intensive methods are available, and might be chosen under different conditions. The key is to utilize those methods that will promote employment and avoid bottlenecks, and even add to the flexibility of the system.

The same principle holds for natural resources as well. Alternative technical means may be utilized to ease pressures on natural resources or the assimilative capacity of the environment. While such technologies or production techniques may not be "optimal" for a private firm, because the government is not constrained by the same pressures of profitability, public sector

activity has the possibility of being technically organized according to how the choice of technique impacts the system as a whole.[6]

5. Geographic Location

It is well known that there are significant regional and local differences in unemployment rates. While firms in the private sector are constrained by competitive pressures in their decisions concerning where to locate, the same is not true of public sector activity.

Of course, there are still constraints to choice location for some public sector activities, but not nearly as much as for the private sector. And while there are certain types of activities that cannot be located just anywhere, there are a large number of activities that have little or no spatial restrictions. This locational flexibility is extended by decreased costs of transportation and expansion and extension of information complexes.

Locational flexibility means that public employment need not cause disruptive dislocation for workers. Workers do not have to migrate to employment opportunities. Rather, employment opportunities can be located where there are unemployed. One factor in facilitating this approach would be to have discretionary public employment programs administered locally.

CONCLUSION

Full employment, or even high employment and capacity utilization rates, are associated with structural rigidities related to a number of undesirable consequences. For this reason, central banks, national governments, and international organizations have resisted policies that would promote full employment. What has been almost entirely overlooked, however, are the ways in

which the selective use of discretionary public employment might promote higher levels of employment without the loss of system flexibility.

A primary reason for overlooking the advantages of public employment has been due to the tendency to evaluate public sector activity by the same criteria that private sector activity is evaluated. But public sector activity serves a different purpose than private sector activity, and so should be evaluated according to different criteria. The public sector is not constrained by the same competitive pressures as the private sector, and therefore has a greater degree of latitude in choosing what activities to engage in, what methods of production to utilize, and where to locate their activities. These characteristics of public sector activity may be utilized to promote higher levels of employment without resulting in rigidities of the production system normally associated with high or full employment. In addition, these same features may also enable these higher levels of employment without undesirable environmental impacts or geographic dislocation of workers.

Endnotes

1. Applebaum and Schettkat (1990, p. 4) and Olmsted and Smith (1994, pp. 2-3) distinguish between "numerical " and "functional" flexibility. The former refers to firms' ability to fire, hire and adjust the hours of employees, the latter to the breadth of employees' relevant knowledge and skills. Harrison (1994, pp. 129-30) makes the same distinction, but has a broader conception of functional flexibility that includes additional factors such as certain types of technological change and decentralized decision-making. Harrison also discusses "wage flexibility," referring to the use of a variety of bonuses and other incentives. Gordon (1996, p. 246) makes a distinction between "disposability," which is close to numerical flexibility, and "true flexibility," which is offering more flexible schedules and work arrangements for employees that are not compulsory but voluntary. The contributions in Killick (1995) offer a number of different conceptions of flexibility, including "cultural flexibility" which refers to less "resistance to change." The concern here is with elasticity of supply, primarily at the industry level, which these various types of microeconomic categories of flexibility may in part determine.

2. Models by their nature entail abstraction and therefore some amount of 'unrealism.' In addition, the same assumption may be legitimate for some applications but not for others. In what follows, 'realistic' and 'unrealistic' assumptions refer to legitimate abstraction and idealization, respectively.

3. *All* of these assumptions are not required to endow the system depicted in the model with a higher degree of flexibility; *any* of them will likely increase the flexibility of the system

4. As Georgescu-Roegen (1978, p. 437, quoted in Gehrke, 1997, p. 229n7) put it, under this assumption an "increase in the number of bulldozers" follows from "accumulating the abstained consumption of...yogurt."

5. See, e.g., Minsky (1986, pp. 308-13), Wray (1997), Mosler (1997-98). Lowe (1988, pp. 106-09) is one of the rare examples of a discussion of flexibility in terms of capital goods and natural resources through public sector activity.

6. The idea that alternative criteria for determining choice of technique may result in different outcomes that are socially and economically beneficial can be found in the work on "appropriate," "intermediate," or "alternative" technology (see, e.g., Schumacher, 1973; Dickson, 1974).

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