Factor-Market Distortions and Dynamic Optimal Intervention: Reply

Harvey E. Lapan
Iowa State University, hlapan@iastate.edu

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Abstract
Edward Ray, in his comment on my 1976 paper, analyzes a slightly different model than the one I presented, and thus reaches different conclusions. His principal conclusions are that: (i) given wage rigidities, a wage subsidy to producers is needed, and this subsidy is equivalent to the optimal static subsidy that ensures full employment in each sector; and (ii) given the forced equilization of wages across sectors, a subsidy to workers is needed to encourage labor transfers between sectors. Thus, Ray finds that full employment is always desirable, whereas I find that some unemployment is (usually) present along the optimum path.

Disciplines
Economic Theory | Income Distribution | Other Economics

Comments
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Factor-Market Distortions and Dynamic Optimal Intervention: Reply

By Harvey E. Lapan

Edward Ray, in his comment on my 1976 paper, analyzes a slightly different model than the one I presented, and thus reaches different conclusions. His principal conclusions are that: (i) given wage rigidities, a wage subsidy to producers is needed, and this subsidy is equivalent to the optimal static subsidy that ensures full employment in each sector; and (ii) given the forced equilization of wages across sectors, a subsidy to workers is needed to encourage labor transfers between sectors. Thus, Ray finds that full employment is always desirable, whereas I find that some unemployment is (usually) present along the optimum path.

The differences in our solutions arise from the different specifications of our models. Ray assumes (his notation):

\[ D_{La} = (u_m w_a - w_m) L_m \]

\[ C = C(D_{La}) = \text{cost of labor transfer} \]

Thus, from (1), Ray assumes that the rate of labor transfers between sectors depends on the unemployment rate in the declining sector \((u_m)\), and the differential in wages received by workers between the two sectors \((w_a - w_m)\). Consequently, (1) represents a behavioral relation concerning labor's voluntary decision to move between sectors. Furthermore, Ray assumes that labor transfers are possible even under full employment; i.e., \(\phi(0, w_a - w_m) > 0 \) for \(w_a > w_m\). Since the return to labor is treated as a pure rent (i.e., the labor supply decision is not responsive to the wage rate) and since Ray assumes that any desired labor transfer between sectors can be accomplished without unemployment (by properly choosing \((w_a - w_m)\)), it immediately follows that full employment is always desirable.

In order to prevent the optimal long-run solution from being obtained costlessly and immediately, Ray assumes that the process of transferring labor is costly \([C = C(D_{La})]\). Though this cost function is not explained by Ray, the costs obviously do not represent the value of output foregone due to (voluntary or involuntary) unemployment; rather, these costs depend only on the number of workers transferred, and not on how the transfer is accomplished.

Thus, the key relationship in Ray's model is this cost function, as can be seen from his equation (9). The optimal rate of labor transfer for a centrally planned economy is determined from (9), and this optimal solution is independent of any distortions that occur within the economy. Of course, how this plan is supported by prices and subsidies will depend upon the types of distortions present, but the conclusion that full employment is always desirable derives solely from his specification of the control model, and not from the range of policy options available to planners who are attempting to achieve this optimal plan.

In my specification of the control problem (1976) it is assumed that some unemployment is necessary in order to transfer labor between sectors:

\[ D_{La} = \phi(u) L_m \]

Again, (3) does not imply the presence of distortions, but rather specifies how transfers are accomplished; for example, some search may be necessary before new employment is obtained. Given (3), the optimal rate of unemployment and labor transfer for a centrally planned economy is determined; the policy needed to support it then depends on the types of distortions present. As noted in between sectors can receive an extra subsidy to compensate them for the extra costs they incur.
the comment by James Cassing and Jack Ochs and in my reply (1978), this unemployment may be voluntary or involuntary; and whether private decisions are socially optimal depends not only on whether price rigidities are present, but also on how private labor transfers are made and on whether congestion occurs in the search process. It is clear that (3) represents the implicit cost of labor transfer; explicitly, the cost of labor transfer is the value of output lost through unemployment:

\[ C(DL_a) = P_m \left[ F_m(L_m) - F_m(L_m(1-u)) \right] \]

\[ = P_m \left[ F_m(L_m) - F_m \left( L_m g \left( \frac{DL_a}{L_m} \right) \right) \right] \]

Thus, the cost of labor transfers that Ray postulates can be derived from the assumption that some unemployment is necessary to accomplish labor transfers. Therefore, whether any unemployment is desirable depends only upon the mechanism by which labor is transferred between sectors.

Finally, how the optimal plan is supported depends on the type of distortions present. As Cassing-Ochs and I (1978) show, if no wage rigidities are present (so that all unemployment is voluntary) and if individuals have perfect foresight, then private decisions will be socially optimal if, and only if, no congestion occurs in the search process. If congestion occurs, some intervention is needed to support the optimal plan. However, if wage rigidities are present then, as I argued in my earlier paper, a wage subsidy to producers is required in order to provide for the optimal rate of employment (unemployment) in the declining sector. Furthermore, as long as some unemployment is required to transfer labor, this subsidy will be less than the optimal static subsidy, as described in my earlier paper. Ray’s conclusion that the optimal dynamic subsidy to producers is the same as the optimal static subsidy does not hold if unemployment is required to affect transfers.

Furthermore, if the only private costs of search to workers are the wages foregone, then all unemployed workers in the declining sector (as a result of the dynamic subsidy being less than the optimal static subsidy) will find it profitable to search for work in the other sector, and no additional subsidy to workers will be required to support the optimal plan. Thus, if at the beginning of each day, the government announces the subsidy for that day, and then the firms tell which workers to show up for work, those workers who find themselves unemployed will choose to search for a job in the other sector. Hence, only the subsidy to producers is required to support the optimal plan.

To conclude, Ray finds that full employment is always desirable, and that two subsidies—one to producers and one to workers—are required. His first conclusion differs from my conclusion because he uses a different model; the specification of the control model, and not the presence of distortions, determines whether full employment is optimal. Regarding his second conclusion, we have seen that the policies needed to support the optimal plan depend on the types of distortions present and the way in which the labor market functions. For his model, since full employment is desirable, his conclusions are correct; however, for my specification, only a subsidy to producers is needed since the only distortion present is the wage rigidity. Finally,

2This is true since it is assumed that wages received in the two sectors are identical. Assume that the worker cannot be employed in the more productive sector on the first day; if he searches for the day, he has probability \( \phi(u) \) of finding a job there, and hence being employed for subsequent days. If there is some positive probability he will not get his old job back, then as long as \( \phi(u) > 0 \) search is desirable for him. Of course, if the search process itself entails costs—above the wages foregone—then he may not choose to search. But if this search process does entail these costs, they should be included in the original control problem.

3Of course, if the workers can only visit one firm per day, and if they do not know ex ante whether their old job is available for that day, they must decide whether to show up for work, hoping to be employed, or whether to look for a job elsewhere. In this case, the optimal subsidy derived in my original paper will not be sufficient. However, note that this specification is not consistent with the control model since the latter implicitly assumes search is needed only to find jobs in the other sector. If search is needed in both sectors, the control model must be modified (see my 1978 paper, fn. 4).
note that both models allow the attainment of the first best solution (given the assumption that labor mobility is costly), despite the presence of distortions. If labor supply decisions were endogenous, and if wages received were required to be the same in each sector, then the return to labor would not be a pure rent and we would have a true second best world.

REFERENCES


