Migration and Job Creation

by

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ABSTRACT

In several empirical studies of urban and regional growth, attempts have been made to estimate the impact of migration as both causal and dependent variable. These studies have not, however, been very clear about how migration acts as a causal variable to induce employment growth or decline. The analysis in this paper is based on a microeconomic model of a firm making investment and job creation decisions in the face of uncertainty about its future labour supply. These decisions are related to the relative costs of over and undershooting the future labour supply and the extent to which short-term substitution is possible between labour and other inputs. Also discussed are the means by which a firm estimates its future labour supply and the impact of migration on this.
In a recent paper, the theoretical foundations of several empirical models of urban and regional growth have been examined. There, it has been argued that such models are based typically on very crude views of the city or region as a labour market. Each model considered had a somewhat unique structure but without too much damage each could be typified as follows. Population growth in the form of natural increase or net immigration directly affects the local supply of labour. Business investment, tied fundamentally to local export activity, determines the demand for labour. The reconciliation of supply and demand in this local labour market leads to a wage adjustment or an unemployment level. Either in turn induces a change in the supply of labour through immigration or outmigration. A central theme of that paper is that, if one is to adopt such a view of urban growth, a clear specification of the operation of the local labour market is necessary.

This paper is the second of a set in which the structure of an urban labour market is examined at a micro-scale level. The first of these papers focussed on the influence of local labour market conditions on the job search and migration behaviour of individual workers. The current paper switches this focus from the supply to the demand side. It examines the impact of labour supply changes, induced by migration, on local levels of job creation. The analysis is based on a microeconomic model of a firm which must make investment and job decisions now for a future time period given some uncertainty about the future supply of labour. The impact on current job creation decisions of variations in the expected future labour supply will be assessed. Such decisions are related to the relative costs of over and undershooting the future labour
supply and the extent to which short-term substitution is possible between labour and capital. Also discussed in the paper are the means by which a firm estimates its future labour supply and the impact of migration and job search activity on this.

1. Model Setting

Let us imagine a firm in the following situation. This firm uses capital (K) and labour (L) inputs under a production function with constant returns to scale to produce some output (Q).

\[ Q = f(K, L) \]  

(1)

The firm sells this output at a fixed, given, unit price P. It purchases capital services at a fixed rental rate (r) and labour at a fixed wage (w). The profit earned (π) by this firm is thus:

\[ \pi = PQ - rK - wL \]  

(2)

As is well known, there is no maximum profit solution for this firm if input supplies are unlimited. Each additional unit of output generates the same profit increment so that total profits are limited only by the level of output. If, however, the firm faces constraints on either or both K or L there will be a maximum-profit production level.

Suppose that this firm must plan its production level one time period ahead. This lead time might be required for example to permit the installation and starting up of new capital equipment. Suppose further that the firm does not know exactly how large its labour supply will be when this new capital equipment becomes operable. It is assumed that, at the start of each production period, a certain labour supply (Z) materializes. The firm may hire part or all of this supply but is
incapable of increasing the quantity materializing. Thus, \( L \leq Z \). From the firm's point of view, \( Z \) is stochastic. However, the firm does at least know that \( Z \) has a certain probability distribution \( (g(Z)) \) with an associated expected value \( (\mu) \) and variance \( (\sigma^2) \).

The firm is thus faced with choosing an investment level now on the basis of an uncertain future labour supply and with later choosing how much of the realized labour supply to employ. There are costs associated with both undershooting and overshooting the future supply. If the firm underinvests, it will forego profits on the underused labour supply and if it overinvests there will be unnecessary capital rental payments for under- or unused capital equipment. Suppose that the firm seeks as its objective to minimize its level of expected "regret", \( E(R) \), in this situation. In other words, it chooses an investment level which minimizes the expected difference between the maximum profit \( (\pi_x) \) which could have been achieved if \( Z \) had been predicted accurately and the profit \( (\pi_0) \) actually obtained.

\[
E(R) = \int_{-\infty}^{\infty} (\pi_x - \pi_0) \cdot g(Z) \, dZ
\]

2. Rationale for the Model

Greenwood (1975; pp. 418-421) has recently reviewed an empirical literature which centres on the impact of migration on local labour markets and vice versa. The idea that local labour market conditions measured by wages and unemployment rates affect the flows of outmigrants and immigrants has long been an accepted part of this literature. That migration itself affects local labour market conditions has also been accepted but this has been seen primarily via a supply mechanism. An
increased inflow of inmigrants increases the labour supply which in the absence of demand change induces an increase in unemployment or a decline in wage levels or both.

More recently, it has been argued that migration also affects a local labour market through a demand mechanism. In such an argument, the demand for labour, i.e., the job creation behaviour of firms, is itself a function of the availability of labour. Borts and Stein (1964; pp. 66-67) present a simple model of this type in which the demand for labour is assumed to be perfectly elastic so that new job creation is positively related to the labour supply elasticity: to the extent that migrants contribute to the supply elasticity by their entry into, or exit from, a local labour market, migration affects local job creation. In fact, Borts and Stein (1964; page 66) assume a setting not unlike that outlined in the preceding section.

"... each firm sells its product at the same price in a national market and assume that the price of capital goods is the same for each firm. Moreover, assume that each firm has the same production function, homogeneous of the first degree, and that there is a limit to the size of firms sufficient to preserve competition."

Borts and Stein are never clear about what forms a "limit" on the size of a firm. Without some limit, the size of an individual firm is indeterminate and there is no guarantee that the remaining assumptions about competitive behaviour (i.e., that each firm is a price-taker in all markets) can be maintained. The model proposed in this paper does provide a limit on firm size through labour supply uncertainty. Further, it establishes a specific linkage from labour supply changes to job creation behaviour in terms of the relative costs of overshooting and undershooting. In this sense, the present paper is an extension of the
work of Borts and Stein.

In an earlier review, it has been argued that much of the empirical work undertaken since Borts and Stein's book lacks an explicit underlying theory. Simultaneous equation models of job creation and migration behaviour have been statistically estimated to "test" the Borts-Stein hypothesis with little apparent concern over the appropriateness of the particular model form used. Perhaps more disconcerting has been the use of short to medium-term change data in this work where clearly the Borts-Stein analysis is based on a long-run equilibrium viewpoint. The model presented in this paper does help to fill in a gap here by providing an explicitly short-term analysis.

In recent years, a variety of labour market models have been proposed with different analyses of job creation behaviour than that being forwarded here. The works of Mortensen (1970), Goldfarb (1973), Mirman and Porter (1974), and Pissarides (1976; chap. 3) are notable among these. In these works, a substantial emphasis is placed on the wage-setting behaviour of individual firms. Although broadly similar to the present model in other respects, these works treat the firm as an active participant in the labour market which varies its wage in order to acquire or hold a particular labour force. The emphasis on wage-setting there is consistent with the interests of those authors: an interest which focusses on the relationship between unemployment and wage rate changes.

In the present paper, this focus on wage setting has been eliminated in order to provide for a focus on the impact of labour supply expectations on job creation. Given a primary interest in the effects of migration on
job creation, this change in focus is credible. This is not to argue, however, that wage setting by individual firms is not important and should be ignored. This paper is merely an attempt to emphasize a particular aspect of the labour market. Subsequent research should address the question of augmenting the model to include wage setting behaviour as well.

3. Job Creation Behaviour: The Leontief Case

Let us first consider a firm with a Leontief production function so that no substitution is possible between capital and labour. The fixed output per unit capital is k and output per worker is fixed at q. Thus, if the firm has a potential labour supply of Z and an inherited capital stock of K at the beginning of a production period its output, Q, is limited by

\[ Q = \min \{qZ, kK\} \quad (4) \]

If the fixed profit per unit output is v, then

\[ \pi_0 = vQ \quad \text{where} \quad v = P - r/k - w/q \quad (5) \]

Suppose, to begin with, that the firm has a surplus of available labour; i.e., qZ > kK. The amount of labour it would actually employ is \( L = (k/q)K \) which is less than Z. Its profit for the period will thus be

\[ \pi_0 = vL = vkK \quad \text{when} \quad qZ > kK \quad (6) \]

If the firm had correctly anticipated the available labour supply, Z, it could have had ready a corresponding capital stock of \( K = (q/k)Z \) and earned a maximum profit of \( \pi_X \)

\[ \pi_X = vqZ \quad \text{when} \quad qZ > kK \quad (7) \]
Its regret in this case is \( R = \pi_x - \pi_0 = v(qZ - kK) \).

On the other hand, suppose this firm has a labour shortage; i.e., \( kK > qZ \). It would employ all available labour; i.e., \( Z = L \). However, the firm is still faced with a surplus of invested capital in that it has \( K \) units available but needs only \( (q/k)Z \). The firm's actual and maximum profits and regret are given as follows:

\[
\pi_0 = (Pq - w)Z - rk \quad \text{where} \quad kK > qZ \quad (8)
\]
\[
\pi_x = vqZ \quad \text{where} \quad kK > qZ \quad (9)
\]
\[
R = r \left( K - \frac{q}{k}Z \right) \quad \text{where} \quad kK > qZ \quad (10)
\]

The expected regret of this firm can now be expressed as follows.

\[
E(R) = \int_0^L (\pi_x - \pi_0) g(Z)dZ + \int_L^\infty (\pi_x - \pi_0) g(Z)dZ
\]

\[
= \int_0^L r \left( K - \frac{q}{k}Z \right) g(Z)dZ + \int_L^\infty v \left( qZ - kK \right) g(Z)dZ \quad (11)
\]

where \( L = (k/q)K \)

The first term corresponds to a labour shortage situation while the second corresponds to a labour surplus. The firm seeks an investment level now, i.e., a value for \( K \), which will make \( E(R) \) as small as possible in the ensuing production period.

The investment decision of the firm can now be analyzed. Differentiating \( E(R) \) in (11) with respect to \( K \) yields the following condition

\[
\text{Prob} (Z \geq L) = \frac{[r \left( \frac{q}{k} \right)]}{(Pq - w)} \quad (12)
\]

The left-hand side of (12) is the probability that the labour supply realized is greater than the number of jobs (\( L \)) optimally associated with a capital stock of \( K \). The \([ \] \) bracketed term on the right-hand side is the capital rental cost per unit labour. The remaining right-hand term \((Pq - w)\) is the firm's revenue per unit labour net of the wage; it is the sum of the
capital rental cost and the firm's profit expressed per unit of labour. Thus (12) asserts that the regret-minimizing firm will choose a level of capital investment (or job creation) which is just large enough that the probability of a surplus labour force materializing is the proportion that capital rental costs form of the sum of capital rental costs plus profits. If for example, the firm finds that rental payments are equal to profits, it will set \( K \) such that the number of jobs created (\( L \)) is the median value for \( Z \).

To some degree at least, this first-order condition is intuitively clear. The marginal cost of undershooting a future labour supply is the foregone profit per unit labour; \( P_q - w - r (q/k) \). From (12), the level of capital investment will be larger the larger is this cost. Conversely, the marginal cost of overshooting is the unnecessary capital rental cost per unit labour; \( r (q/k) \). The larger is this latter cost, the lower will be the optimal level of capital investment.

To illustrate this condition, let us assume that the probability distribution for \( Z \) is Normal with an expected value of \( \mu \) and a variance of \( \sigma^2 \). The regret-minimizing firm will have a behaviour pattern as illustrated in Figure 1. There, the difference between \( L \) and \( \mu \) is expressed in standard deviations, \( \sigma \), for various values of \( [r (q/k)] / (P_q - w) \) between zero and one. The relationship of course has vertical asymptotes at both zero and one on the horizontal axis. 6

One of the most interesting features of (12) is that it provides a simple explanation for why the same firm might have different kinds of job creation behaviour under different economic conditions. If, for example, unit profits are large, the firm will be bullish in setting its
Figure 1: Job Creation (L) for the Leontief Firm
investment and job creation targets. On the other hand, in slump or low profit conditions, the firm will be less likely to find overshooting worth the risk involved. Thus, the impact of an anticipated labour supply on job creation has been tied to the relative profitability of production.


For the Leontief firm, it has just been argued that there is a simple relationship linking the job creation decision to the costs of over- and undershooting a future labour supply and to this supply's probability distribution. In part, this simple relationship is made possible by the zero elasticity of substitution between inputs for the Leontief firm. However, if a firm is able in the short run to vary its ratio of capital to labour, it can compensate in some degree for a shortfall or surplus of labour. In other words, the possibility of substitution alters the costs of over- and undershooting thereby affecting the firm's job creation decision (or, more correctly, capital investment decision). 7

In this section, a Cobb-Douglas production function is used to get an initial impression of the impact of input substitution on job creation behaviour.

Let us retain all of the assumptions and variables as outlined in section 3 except that equation (4) is now replaced as follows:

\[ Q = AK^aL^{1-a} \quad A > 0 \quad 0 < a < 1 \quad (13) \]

Suppose that the firm anticipates a labour supply of N units when it is making its capital investment decision. The largest profit it could earn is found by maximizing (2) subject to (13) and to the constraint...
that \( L = N \). The following first-order condition is obtained.

\[
K = (P \alpha A/r)^{1/(1-\alpha)} N \tag{14}
\]

The maximum profit obtainable is thus

\[
\pi_x = sZ \tag{15}
\]

where

\[
s = (PA)^{1/(1-\alpha)} (\alpha/r)^{\alpha/(1-\alpha)} - r^{-\alpha/(1-\alpha)} (\alpha PA)^{1/(1-\alpha)} - w \tag{16}
\]

The actual profit earned by the firm differs depending on the supply of labour actually materializing in the production period. Given that the capital stock is now fixed, the profit-maximizing amount of labour \( J \) would be given by the following.

\[
J = (AP (1-\alpha) / w)^{1/\alpha} K \tag{17}
\]

If the supply of labour, \( Z \), is greater than \( J \), the firm will employ only \( L = J \) units. If \( Z \leq J \), then \( L = Z \). Note that there are now three different job creation variables: \( N \), the number of jobs on which an investment decision is made; \( J \), the profit-maximizing number of jobs given a capital stock of \( K \); and \( L \), the number of jobs actually filled.

The profits earned by the firm are thus either of the following.

\[
\pi_0 = PAK^{\alpha} J^{1-\alpha} - rk - wJ \quad \text{if } Z \geq J \tag{18}
\]

or

\[
\pi_0 = PAK^{\alpha} Z^{1-\alpha} - rk - wZ \quad \text{if } Z < J \tag{19}
\]

Its regret is thus \( R = \pi_x - \pi_0 \) for any labour force realization, \( Z \).

The firm's decision problem is to choose a target level of job creation, \( N \), and an associated capital stock via (14) so as to minimize its level of expected regret given by

\[
E(R) = \int_0^J (\pi_x - \pi_0) g(Z) dZ + \int_J^\infty (\pi_x - \pi_0) g(Z) dZ \tag{20}
\]

The optimal behaviour of this regret-minimizing firm is difficult to assess analytically because, unlike the earlier Leontief firm, \( \pi_0 \) is not a linear function of \( Z \). However certain aspects of its behaviour...
can be identified using numerical simulations and a graphical interpretation.

Consider as an example the following set of parameter values.

\[ P = 1.25, \ A = 1.50, \ w = 3.50, \ r = .09, \ \alpha = 0.4 \]  \hspace{1cm} (21)

Suppose further that this firm anticipates a future labour supply of \( N = 1,000 \) units. By (14), the optimal capital stock is \( K = 34,253 \) and, by (17), \( J = 2,006 \) labour units. The maximum profit schedule, \( \pi_x \), and the actual profit schedules, \( \pi_o \), are displayed in Figure 2 in this case for different labour force realizations, \( Z \). The firm's regret is the vertical difference between \( \pi_x \) and \( \pi_o \) at a given \( Z \). For example, if 1,600 labour units materialize, the regret is 264. In Figure 3, the regret schedule has been graphed as a function of \( Z \).

The solid curves in Figures 2 and 3 are for a firm planning for \( N = 1,000 \). A larger value for \( N \) would shift the actual profits schedule, \( \pi_o \), upwards and to the right. A new regret schedule would thus result which represents a rightward parallel shifting in Figure 3.\(^{10}\) As an example, the dotted curves in Figures 2 and 3 are the \( \pi_o \) and \( R \) schedules when \( N = 1,600 \).

The firm's objective is to minimize its level of expected regret by choosing an appropriate \( N \) or \( K \). Which value of \( N \) is most appropriate depends on the location and shape of \( g(Z) \); the probability distribution of \( Z \). As shown in Figure 4, given a particular \( g(Z) \), the problem is to find an \( N \) (and an associated regret schedule) which makes \( E(R) \) in (20) as small as possible. Which value of \( N \) this will be depends on three factors; (i) the expected value of \( Z \), \( E(Z) \), (ii) the symmetry of \( g(Z) \) about \( E(Z) \), and (iii) the relative heights of the regret schedule above versus below \( Z = N \). We have little here to say about either (i) or

\[ \_] \]
Figure 2: Maximum and Actual Profit Schedules for CD firm with $P = 1.25$, $A = 1.5$, $w = 3.50$, $r = 0.09$, and $\alpha = 0.4$. 
Figure 3: Regret Schedules for CD firm with $P = 1.25$, $A = 1.5$, $w = 3.5$, $r = .09$, and $\alpha = 0.4$. 
Figure 4: Regret Schedules and Probability Distribution for Z for CD firm.
(ii) at the moment. However, (iii) is related to the costs of overshooting versus undershooting about which more can be said.

In Figure 3, the regret schedule tends to increase for smaller \( Z \) values than \( Z = N \) faster than it increases for larger \( Z \) values above \( Z = N \). In other words, the costs of overshooting increase more rapidly than the costs of undershooting as one moves away from \( Z = N \). This is a general result for the CD firm. That is, the regret from undershooting \( Z \) by say 200 jobs is always larger than the regret from overshooting \( Z \) by the same amount. Thus, if \( g(Z) \) is symmetrical about its expected value, the CD firm will always rationally undershoot its expected future labour supply; i.e., \( N < E(Z) \). It will never overshoot. This is in clear contrast to the Leontief firm which either over or undershoots depending on the magnitude of profits relative to capital rental payments.

Consider as an example the CD firm with parameter values given in (21) and facing a labour supply which is Normally-distributed with an expected value of 1,000 and a standard deviation of 200. This is the probability distribution drawn in Figure 4. By numerical approximation, the value of \( E(R) \) in (21) has been computed for different choices of \( N \). These results are summarized in Figure 5. The smallest value of \( E(R) \) occurs near \( N = 991 \) or just under \( E(Z) = 1,000 \). Thus, the regret-minimizing firm will here choose to undershoot its expected future labour force and this is a direct consequence of the size of overshooting costs relative to undershooting costs.

It is not difficult to show that for any CD firm the marginal costs of overshooting are higher than undershooting. Let us calculate the regret facing a firm at some labour force realization \( Z < J \). Using (15)
Figure 5: Expected Regret, $E(R)$, as a function of the level of Job Creation, $N$. 
and (19),

\[ R = sZ - P A k^{1-\alpha} + rK + wZ \]  

(22)

Let us consider two different realizations, \( Z_1 = (1-v)N \) and \( Z_2 = (1+v)N \) where \( 0 < v < 1 \). \( Z_1 \) and \( Z_2 \) are the same proportionate distance either side of \( N \). The difference, \( R_1 - R_2 \), between the two associated regret levels is, using (22) and (13),

\[
R_1 - R_2 = R(Z=Z_1) - R(Z=Z_2) \\
= \{(1+v)^{1-\alpha} - (1-v)^{1-\alpha} + 2v(1-\alpha)\} \cdot \frac{(\alpha/r)^{\alpha/(1-\alpha)}}{(1-\alpha)} \cdot (PA)^{1/(1-\alpha)} N
\]  

(23)

The sign of \( R_1 - R_2 \) is determined by the sign of the expression in \( \) parentheses. For \( v \) between zero and one (or \( Z_1 \geq 0 \) and \( Z_2 \leq 2N \)) and for \( 0 < \alpha < 1 \), this term, and therefore \( R_1 - R_2 \), is unambiguously positive. Thus, the cost of overshooting (i.e., \( R(Z=Z_1) \)) is always higher than the cost of a similar proportionate undershooting (i.e., \( R(Z=Z_2) \)).

It is more difficult to explain why the marginal cost of overshooting is always higher for a CD firm. One conjecture concerns the unit elasticity of substitution between labour and capital in a Cobb-Douglas production function. This elasticity limits the extent of substitution and thus may not permit the firm to compensate adequately when it overshoots a realized labour force. Experimentation with other production function forms is needed before the validity of this conjecture can be assessed.

5. Labour Supply Expectations

In the preceding two sections, the firm is assumed to be aware of the distribution of future labour supply realizations, \( g(Z) \). How realistic is it to assume that the firm knows this distribution? In one sense, it
does not matter that the firm may mistakenly guess the shape of this distribution. What is important here is the firm's perception of the distribution and not the real distribution itself. One might be willing to argue that in any case the firm forms crude guesses of a few of the parameters of \( g(Z) \) such as the mean and standard deviation and then behaves as though these underly a roughly bell-shaped distribution.

How could the firm estimate a parameter such as \( E(Z) \)? As one approach, the firm might extrapolate from its recent past history of labour force realizations. In this case the only information used by the firm is the number of job seekers materializing at the start of each production period. This approach needs to be amplified in at least two respects.

First, the firm typically has two sources of labour supply; new applicants and the firm's employed labour from the previous production period. The amount of labour forthcoming from the latter source is affected by retirement, death, and quit rates. Thus in projecting its expected future labour supply, the firm might want to consider separately the potential flow of new applicants and the likely retention of previous-period workers.

Secondly, it is assumed that the firm has definite production periods and hires workers only at the start of each period. However, job seekers do not in general arrive only at the start of each period. More commonly, they arrive at varying rates throughout the entire period. The firm which hires only at the start might well maintain a file of acceptable new applicants during each period. Such a file would be used to make employment offers at the start of the next production period. This file serves an additional purpose however in that it gives the firm
a continuous flow of information about its potential labour supply. Thus, a firm might be expected to include this information as well in making its investment decision.

This link between applicant flows and job creation has been incorporated in different forms in a few labour market models. Mortensen (1970; page 183), for example, relates the flow of job applicants in part to the level of local unemployment. He sees an increase in local unemployment as augmenting job search activity in general which means a greater flow of applicants to an individual firm. In his model, it is thus the current disequilibrium (unemployment) in the labour market on which the firm bases its labour supply expectations rather than past labour force realizations.

Mortensen's model is very interesting but its focus on local unemployment as the generator of search activity is too narrow. Mortensen (1970; pp. 172, 178-180) suggests for example that search activity is also undertaken by persons who are already employed but looking for a better job. Even in the absence of unemployment one might therefore expect some search activity.

Another problem in focusing on unemployment as the generator of job search activity has to do with how local unemployment is measured. Local unemployment might be defined as the number of local area residents who are looking for work but not currently employed. If an unemployed job seeker from elsewhere migrated to this local labour market and then looked for work, he or she would be included in an unemployment count. However, suppose this same job seeker chose not to migrate (i.e., change one's place of residence) at the outset but rather to search in this local
labour market by mail or telephone application or by making a few job-hunting trips to the area. Only after a successful application does this job seeker then migrate. Such a job seeker would not be included in the number of locally unemployed because his or her place of residence was outside the local labour market. This is a second reason why a focus exclusively on local unemployment as a generator of search activity is inappropriate.

Let us summarize these above points in the following mathematical form:

\[ E(Z) = f(L, A) \]  \hspace{1cm} (24)
\[ A = A_{LU} + A_{LE} + A_0 \]  \hspace{1cm} (25)
\[ A_{LU} = g(U) \]  \hspace{1cm} (26)

where \( L \) = labour employed currently
\( A \) = flow of total job applications
\( A_{LU} \) = flow of job applications from unemployed local residents
\( A_{LE} \) = flow of job applications from employed local residents
\( A_0 \) = flow of job applications from non-residents
\( U \) = number of unemployed

This formulation emphasizes the multiplicity of variables on which a firm's labour supply expectation might reasonably be based. Local unemployment, search activity by employed local residents, search activity by non-residents, and the size (and retention rate) of a firm's previous-period workforce all contribute to the firm's estimate of \( E(Z) \).

How does migration affect a firm's target level of job creation? There are two principal mechanisms operative here. First, to the extent that some individuals migrate and then search for work, the level of in-migration affects \( U \) which in turn affects \( A_{LU} \) and hence \( E(Z) \). Secondly, however,
immigration may affect E(Z) and thus job creation in an indirect manner. To the extent that individuals engage in long-distance search (i.e., affect A_o) before migrating, E(Z) can be altered even though the migration does not occur until the jobs have in fact come available. It is, in other words, the potential willingness of non-residents to migrate to and work in an area which through its effect on A_o causes firms to fix a particular level of job creation. Thus, the effect of immigration on job creation may well be anticipatory.

Both of these mechanisms are undoubtedly important empirically. However, neither has been given very much attention in empirical research. There has been some research on the impact of local unemployment on immigration and outmigration. However, no attempts have been made to link these directly to job creation. If one wishes to clear the air on the debate over the growth-inducing role of migration, it is of fundamental importance that these mechanisms be examined empirically.

6. Conclusions

In this paper, a number of issues relating migration to job creation have been raised. A model of a firm has been presented which makes job creation decisions on the basis of an uncertain future labour supply. This analysis has identified certain critical variables in the firm's decision; the costs of over and undershooting an available labour supply, the possibility of short-term substitution between labour and other inputs, and the information channels by which the firm estimates the likelihoods of different future labour supplies. Critics may wish to take exception to the particular model and assumptions used in this paper.
However, I believe that these conclusions are relatively robust in that other models of a firm would tend to give similar results. These conclusions hopefully will assist future empirical researchers in formulating better models of the impact of migration on job creation.
There are other differences as well between these models and the one presented here. These other models do not, for example, tend to see the firm as being constrained by its labour supply. Often, there is instead a constraint on demand or on productivity which limits the size of a firm.

A similar argument is made in Miron (1978; pp. 529-531) in relation to job search activity.

Since \( Pq - w = \frac{rq}{k} + \pi_0 \), the maximum value for the above ratio is 1 and this occurs when \( \pi_0 = 0 \). Since \( \frac{rq}{k} \) and \( \pi_0 \) are positive, the ratio must be greater than zero.

Later in this section a distinction is drawn between the number of job openings (\( N \)) on which a capital investment decision is made and the number of jobs (\( L \)) actually filled in the next period. For a Leontief firm \( L \leq N \) but for a CD firm \( L \) may be larger than \( N \) as well.

It is assumed that the largest profit will be non-negative. In (14) below, this is equivalent to assuming \( s \geq 0 \).

\( J \) is obtained by maximizing (2) with respect to \( L \) assuming a fixed capital stock.

Taking the derivative of \( R \) with respect to \( Z \) yields, when \( Z \leq J \),

\[
\frac{dR}{dZ} = \frac{(PA)^{(1-a)}}{(\alpha/r)^{a/(1-a)}} \frac{(1-a)(1-a)}{(1-(N/Z)^a)}
\]

Thus, the slope of \( R \) will be the same whenever \( Z \) is a fixed proportion of \( N \) regardless of the level of \( N \). It is in this sense that the effect of increasing \( N \) is a roughly parallel right shift in the regret schedule.

This ignores of course the argument as to whether a firm can continually misperceive \( g(Z) \) without eventually coming to recognize its errors and possibly changing its behaviour or approach.

Mortensen also emphasizes the role of wage-setting by the firm relative to other firms' wages in the local labour market.
The simplest assumption is that each unemployed person searches at the same intensity so that search activity in total is proportional to the number of unemployed.

In this latter empirical work, there has been also virtually no concern for the process being modelled. In my view, this work has been consistent with an assumption that many migrants are unemployed both before and after their moves. How else can one argue that local unemployment levels are a principal inducement to outmigration and deterrent to immigration as these empirical studies do? There may well be a certain cohort of migrants who are like this. However, is this a dominant proportion of all migrants? In his survey, Greenwood (1975; page 411) acknowledges that empirically a local unemployment variable has not often been statistically significant in determining gross migration flows. I believe that this is because unemployed persons are a relatively small proportion of all migrants and that local unemployment levels are not a principal concern to the rest of these migrants.
References


