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The Rationale for Government Involvement in Manpower Training in Canada: Theory and Evidence

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The Rationale for Government in Manpower Training in Canada

Theory and Evidence

Keith Newton

This paper intends to develop more fully the theoritical aspects of the « structural maladjustment » hypothesis and to examine the empirical evidence for Canada for substantiation of government intervention in the training field.

Two interesting articles in recent issues of this journal have addressed the question of the economic rationale for government-supported manpower training programmes. The first, by Mehmet,[1] reviewed three theoretical bases for government intervention in the labour market in the form of subsidized training programmes. The arguments were concerned with the « structuralist », « structured market », and « externality » hypotheses, respectively. The second article by Gunderson,[2] is an elegant application of contemporary Public Expenditure Economics to the question of government subsidized training schemes which develops in considerable detail the third of Mehmet's cases — the externality argument.

The present paper has two objectives. The first is to develop more fully the theoretical aspects of what we shall call the « structural maladjustment » hypothesis and the second is to examine the empirical evidence for Canada for substantia- | tion of government intervention in | the training field.
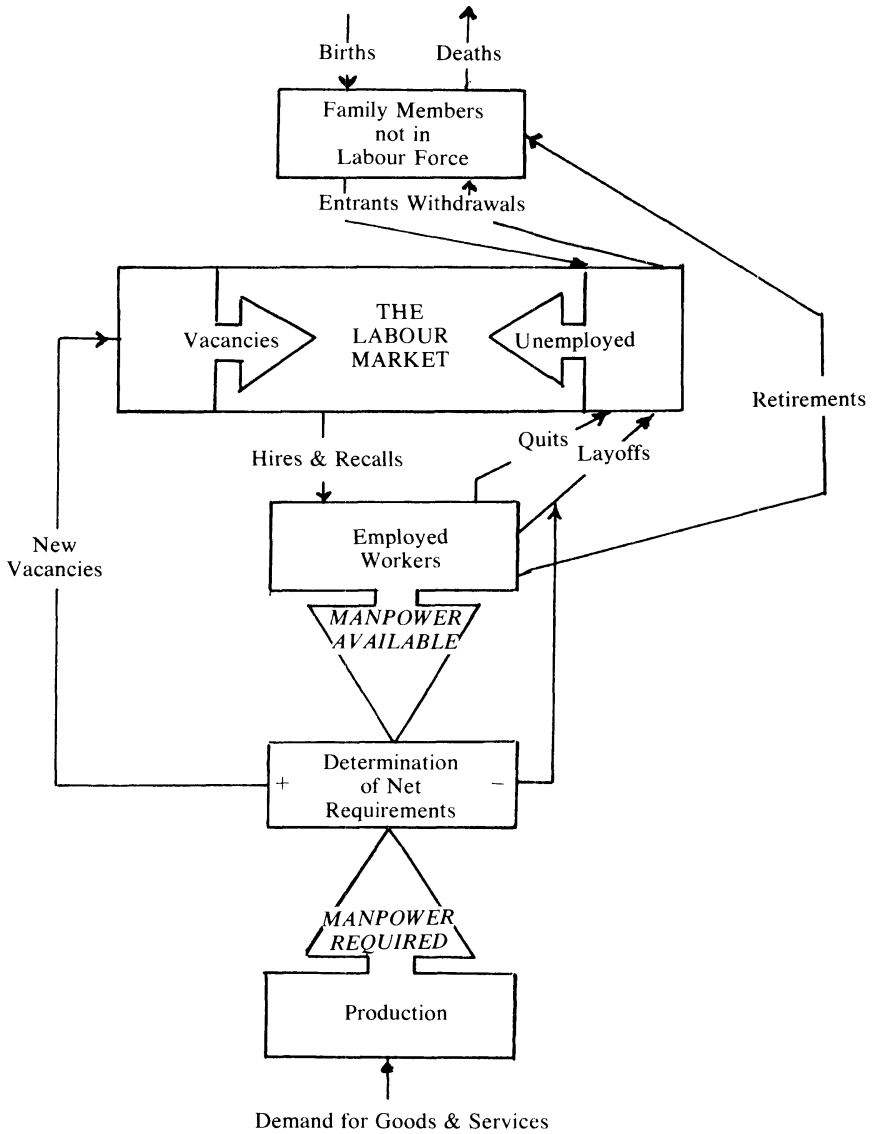
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[1] Ozay MEHMET, « A Critical Appraisal of the Economic Rationale of Government-Subsidized Manpower Training» *Relations Industrielles,* vol. 25, no. 3, September 1970, pp. 568-580.

[2] Morley GUNDERSON, « The Case for Government-Supported Training Programs », *Relations Industrielles,* vol. 29, no. 4, pp. 709-723.

FIGURE 1

Stocks and Flows in the Labour Market

Births   Deaths

Family Members
not in
Labour Force

Entrants Withdrawals

Vacancies   THE
LABOUR
MARKET   Unemployed

Retirements

Hires & Recalls   Quits   Layoffs

New
Vacancies

Employed
Workers

MANPOWER
AVAILABLE

Determination
+   of Net   −
Requirements

MANPOWER
REQUIRED

Production

Demand for Goods & Services

THE STRUCTURAL MALADJUSTMENT HYPOTHESIS

The fundamental assertion of what may be called the structural maladjustment case for government involvement in training is that the labour market, left to its own devices, encounters impediments to efficient allocation which give rise to structural unemployment and potentially inflationary, growth-inhibiting bottlenecks.[3] In this section we discuss the allocative inadequacies of the labour market and suggest that to the extent that government-sponsored training may alleviate them it may be expected to make some contribution to certain national economic objectives.

It is useful at the outset to illustrate the complex nature of the allocation task which the labour market is called upon to perform. Figure 1[4] depicts the stocks and flows of workers and jobs which characterize the labour market.

A fuller appreciation of the intricacy of the allocation process is gained when it is borne in mind that each stock and flow is multidimensional: workers are characterized by age, education, experience, occupation, geographical location, etc., while jobs are similarly specified by a variety of characteristics. The market, in this representation, is seen as the locus of myriad reconciliations between the variegated requirements of many jobs, and the vastly diversified blends of workers' characteristics and qualifications.

A numerical example will serve to illustrate the sheer size of the flows involved in the Canadian labour market. The data are derived from estimates complied by Statistics Canada of the gross flows of the population among the « employed », « unemployed », and « not in the labour force » categories. Table 1 shows that the relatively small change in employment of 11,000 persons between the months of January and February 1972 in fact masks an inflow to employment (from unemployment and from not in the labour force) of 293,000 persons, an outflow of 296,000 persons from the employed to the unemployed or not in the labour force categories, and a net inflow into employment from external sources (immigration, school leavers) of 14,000 persons.

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[3]   See MEHMET, *op. cit.,* pp. 569-570.

[4]   The diagram is a modified version of that which appears in HOLT, C. C. and DAVID, M. H., « The Concept of Job Vacancies in a Dynamic Theory of the Labor Market », in *The Measurement and Interpretation of Job Vacancies* (New York: NBER, 1966), p. 79. It is largely self-explanatory, but two points should be noted: (a) although the diagram presumably could be used to depict a micro market with homogeneous workers and vacancies, we are examining the complicated adjustments required by the heterogeneity of men and jobs at the macro level; (b) it is assumed for simplicity that only unemployed workers are hired, so that a worker moving directly from one job to another is considered momentarily unemployed. Similarly, new entrants to the labour force who are brought straight from the household to a job are assumed to move via the pool of unemployed. Moreover, apart from retirements, persons withdrawing from the labour force are assumed to do so via the unemployment pool.

TABLE 1

Stocks and Flows in the Canadian Labour Market:
An Illustrative Example for January-February 1972
(000's)

Total employment in previous month	7,917
Population flow into employment from unemployment	174
Population flow into employment from net in the labour force	119
Population flow out of employment to unemployment	− 134
Population flow out of employment to net in the labour force	− 162
Net external population flow into employment	14
Total net change in employment	11
Total employment in current month	7,928

Source: Denton, F., C. Feaver and A. L. Robb, « Stock-Flow Relationships and Short-Run Dynamics: A Study of the Canadian Labour Market», a study conducted for the Economic Council of Canada, July 1974.

In addition to the quantitative magnitude of these flows of workers and jobs, their qualitative dimension imposes a further burden upon the allocative mechanism. It is argued by the exponents of the structural maladjustment hypothesis that the process of growth in the industrialized economy entails rapid and continuous changes in tastes, income distribution, and technology. Simultaneously, there occur whifts in emphasis from one product to another within firms, from one firm to another within industries, from one industry to another within regions. In this way are generated the large and complex flows we have described.

The inherent ability of the labour market to undertake the task of matching men and jobs is hampered by the following factors. First, ties of culture and religion, together with distance, impede geographical mobility. Secondly, occupational mobility may be discouraged by trade union limitation of entry into certain trades and by the phenomenon of monopsonistic 'locking-in' of employees to jobs in which they acquire 'specific', non-transferable skills. In addition, the labour market is segmented by artificial barriers based on such things as race, sex, and age, legislation notwithstanding.

Finally, the ability of the individual to overcome the unsuitability of his present human capital characteristics is severely limited. Training requires money. But human capital cannot be divorced from its possessor, is therefore illiquid, and thus cannot serve as a hedge against risk and uncertainty.[5] This characteristic cuts both ways: the unemployed worker may have great difficulty in borrowing money on the security of his own potential and may himself be reluctant to incur a

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        [5] See TOBIN, J., «Liquidity Preference as Behaviour Towards Risk», *Review of Economic Studies,* February 1958, pp. 65-86.

debt because of the uncertainty of his prospects. Adjustments to skill-mismatching are therefore further impeded.

It is in the light of such factors that government manpower policy is advocated to augment the allocative mechanism of the market. By intervening in such areas as training, mobility, the provision of labour market information, and vocational counselling and placement services, it is argued, the public authority may promote a better matching of supply to the continuous, rapid and often sharp, changes in labour demand. This in turn would help to reduce the bottlenecks, structural unemployment, and other market pressures and strains which impede and distort the process of economic growth.

AN ILLUSTRATIVE MODEL OF STRUCTURAL MALADJUSTMENT

Structural maladjustment from the particular standpoint of training may be illustrated with reference to a model developed by Barbara Berman.[6] It is assumed that there exist two kinds of labour — skilled and unskilled — which are fixed in supply[7] so that the size and skill composition of the labour force are represented by the point E in Figure 2(a). ON and OM are the economy's endowments of skilled and unskilled labour, respectively, so that the rectangle OMEN contains the feasible combination of the two kinds of labour.[8]

Suppose that the economy is initially at point A, where output is such as to employ OS skilled workers and OU unskilled workers. It is the «employment composition point» for a given level of output. The curved employment expansion path is then the short-run locus of such points for various output levels: an increase in aggregate demand necessitates greater employment of both skilled and unskilled labour. Unemployment at A is equal to AG units of skilled and GE units of unskilled labour.

The curvature and position of Berman's expansion path suggests that a short-run increase in demand would raise the proportion of unskilled employed. As aggregate demand is increased from point A, however, the economy's expansion is curtailed by the bottleneck at B, where the supply of skilled labour is exhausted, though there remain BE units of unskilled labour structurally unemployed. (This exemplifies the classic case of the simultaneous existence of excess demand for one kind of labour and excess supply of another.)

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[6] BERMAN, B. R., «Alternative Measures of Structural Unemployment», in A. M. Ross (ed.), *Employment Policy and the Labour Market* (Berkeley: University of California Press, 1965), pp. 256-268.

[7] The analysis is short run.

[8] If all skilled workers were willing to take unskilled jobs, then the area of feasible combinations is extended to include the triangle PME.

FIGURE 2

Structural Maladjustment in the Labour Market

To achieve an orderly expansion beyond point B, Berman suggests that the skill mix of the economy needs to be relocated from point E to a point closer to the expansion path. Transformation of unskilled into skilled workers through training will achieve this end, causing E to move « south-east ». If EF unemployed unskilled persons are trained, then FC persons are added to the skilled work force, BF additional untrained unskilled persons are hired along with the FC (= EF) newly-trained skilled workers.

We may elaborate on the adjustment mechanism, injecting a further element of reality, as follows. We may suppose that the labour market will be undergoing an adjustment process from two sides. On the one hand, employers are frequently endowed with sufficient business acumen to recognize the onset of potential bottlenecks and to make adjustments accordingly: hiring standards may be lowered and jobs re-

designed[9] so that their input mix is torqued in the direction of more « unskilled-intensive » production methods. This will tend to move the employment expansion point « north-west » as shown in Figure 2: point C is transformed into point C'.

On the supply side, simultaneously, factors are at work which tend to transform the skill endowment mix. Firms faced with the growing tightness in the market for skilled labour will tend increasingly to « make » rather than « buy » their skilled labour requirements, by undertaking training. In the face of the buoyancy of the market for skilled labour unskilled workers may also be tempted by the prospective returns to invest in skill training. These two forces tend, of course, to move the skill endowment point, E, south-eastward, from E to E', as shown in Figure 2.

We have already discussed the reasons why the labour market, unaided, may not be capable of adjusting fully — that is to the point where the expansion path and the endowment point coincide. There remains what we shall call a « residual adjustment task » that needs to be performed on grounds of allocative efficiency. It is represented, geometrically, by the triangle E'F'C'. In other words, after the free-market adjustment forces have worked out, there still exists a bottleneck at B' with structural unemployment of B'E' unskilled workers.

In the absence of further adjustments by the unaided market, the potential role for government intervention is apparent: the gap between E' and C' may be closed by government-sponsored training which would transform F'E' unskilled workers into skilled workers. The skill endowment point E' is thereby moved south-east until it is coincident with C'. At this point there is no unemployment of either kind of labour and the economy's short-run production potential is realized.

The rationale for government intervention of this type is that by augmenting the allocative efficiency of the labour market, certain national economic objectives are served. By alleviating the potentially inflationary and output-inhibiting shortages represented by bottlenecks such as B and B', the aims of price stability and economic growth are served. To the extent, moreover, that government intervention will perform the « residual adjustment » task, structural unemployment is reduced — which promotes attainment of the full-employment goal.

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        [9] For employer reactions to tight labour markets, see DOERINGER, P. B. and PIORE, M. J., « Labour Market Adjustment and Internal Training », *Proceedings of the Industrial Relations Research Association*, Winter 1965, pp. 250-263; DAVIS, L. E., « The Design of Jobs », *Industrial Relations*, October 1966, pp. 21-45; LIVERNASH, E. R., « An Active Employer Manpower Policy », *Proceedings of the Industrial Relations Research Association*, Winter 1966, pp. 208-218.

EMPIRICAL EVIDENCE OF MALADJUSTMENT IN CANADA

Theoretical discussion of the structural maladjustment case for government intervention in the labour market suggested the propriety of an attempt to adduce empirical evidence as to the degree of structural maladjustment in Canada. One approach is to take as a model the methodology of Dow and Dicks-Mireaux,[10] whose seminal article in this field is probably responsible for the currency which the term « structural maladjustment » now enjoys.

Essentially, the model focuses upon the relationship between the vacancy rate and the unemployment rate, and may be described with reference to Figure 3.

FIGURE 3

The Unemployment-Job Vacancies Map[11]
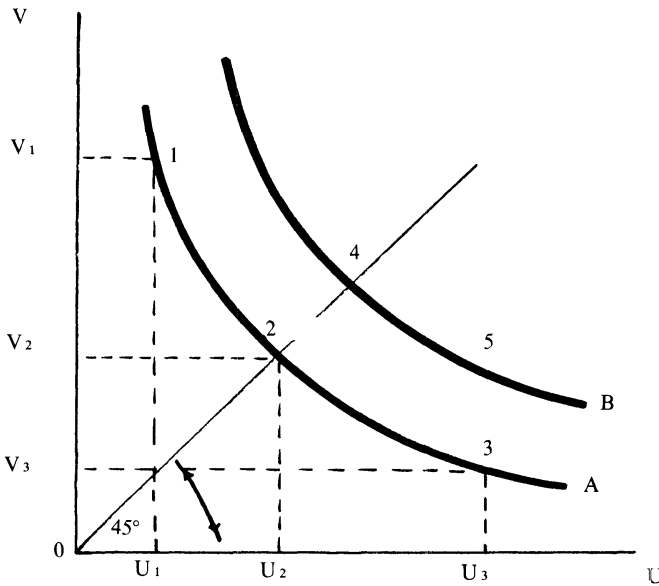
    [10]   DOW, J. C. R. and DICKS-MIREAUX, L. A., « The Excess Demand for Labour: A Study of Conditions in Great Britain, 1946-56 », *Oxford Economic Papers*, New Series, vol. 10, no. 1, February 1958, pp. 1-33.
    [11]   This is the term used by Jacob MINCER in a more recent application of the Dow, Dicks-Mireaux model: « Comment », in NBER, *The Measurement and Interpretation of Job Vacancies* (New York, 1966), pp. 120-126.

Areas of high demand and low demand may be thought of as separated by the line running north-east from the origin, with high demand above and to the left of the line; low demand below and to the right. Zero net excess demand is defined as all points where unemployment and «true»[12] vacancies are equal — that is, the 45-degree line.[13] Various points on this line, such as points 2 and 4, correspond to different *degrees of maladjustment*. The degree of maladjustment at any time is measured as the amount of unemployment which would exist if there were zero excess demand. Thus for curve A in Figure 3 the degree of maladjustment is measured as OU_2.

Assuming that the curves such as A and B approximate a rectangular hyperbolic shape, the degree of maladjustment, m, can be calculated for any pair of values of unemployment, u, and vacancies, v, as $m = \sqrt{uv}$.

For any given degree of maladjustment, there is a series of points corresponding to different degrees of net excess demand. Thus movements *along* a curve such as A or B represent *cyclical* changes, and *shifts* of the curve, north-east or south-west, represent *structural* changes in the degree of maladjustment.

However, a number of caveats have emanated from official sources concerning the utility of the Job Vacancy Survey data for the type of analysis described above, based mainly on the conceptual incompatibilities of the unemployment and vacancy series.[14] For this reason it was felt that attempts at precise statistical estimation of u, v relationships, and the degree of structural maladjustment in Canada were not warranted. The more modest alternative employed is simply to look at the behaviour of unemployment and vacancy rates over time as the basis for some rather guarded comments. For this purpose quarterly, seasonally adjusted unemployment rates are used in conjunction with a newly constructed series of quarterly seasonally adjusted vacancy rates which

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[12] DOW and DICKS-MIREAUX discuss in some detail the factors likely to cause under-statement or over-statement in reported vacancies. They estimate the value of a 'statement ratio', s, defined as *reported* vacancies divided by *true* vacancies, so that their corrected vacancy data are in fact 'v/s'.

[13] So, at least runs the stylized version of the theory. Jacob MINCER has pointed out that «it is not... clear whether the equality of unemployment and job vacancies represents an aggregative equilibrium in any sense other than of its own definition... This is an empirical question and it is not, a priori, obvious whether this locus would be below or above the 45-degree line.» Comment on HOLT, C. C. and DAVID, M. H., «The Concept of Job Vacancies in a Dynamic Theory of the Labour Market», in NBER, *The Measurement and Interpretation of Job Vacancies* (New York: Columbia University Press, 1966).

[14] «A Note on Job Vacancy and Unemployment Statistics», *Quarterly Report on Job Vacancies,* Fourth Quarter, 1972, Statistics Canada, cat. no. 71-002; and BOU-CEK, J. A., «Job Vacancy Survey», *Canadian Statistical Review,* April 1975.

FIGURE 4

**Unemployment and Vacancy Rates, Canada, 1953-74**
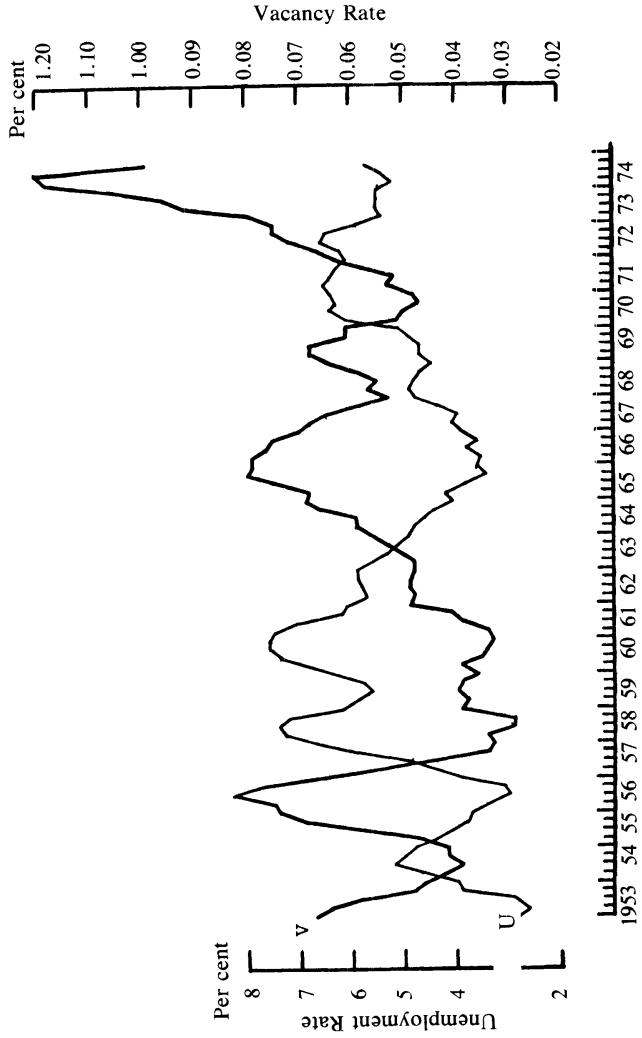
incorporates elements of the NES vacancy estimates, the Department of Finance Help Wanted Index, and the Job Vacancy Survey estimates.[15]

In Figure 4 the unemployment and vacancy rates are plotted over the period 1953-74, and the « inverse parallelism » referred to by Dow and Dicks-Mireaux is apparent — the peaks of the U series being approximately aligned with troughs of the V series, and *vice versa* — although some evidence of a general upward drift of *both* series in recent years may be discerned.

More interesting, however, is the u, v relationship of Figure 5 which clearly indicates the expected broad cyclical swings, and also suggests some outward movement of the relationship over time. Particularly disquieting, however, is the apparent breakdown of the relationship from 1970 on, which on theoretical grounds constitutes an almost classic case of increasing maladjustment.

FIGURE 5

Cyclical and Structural Movements in the Canadian U, V Relationship

Unemployment Rate

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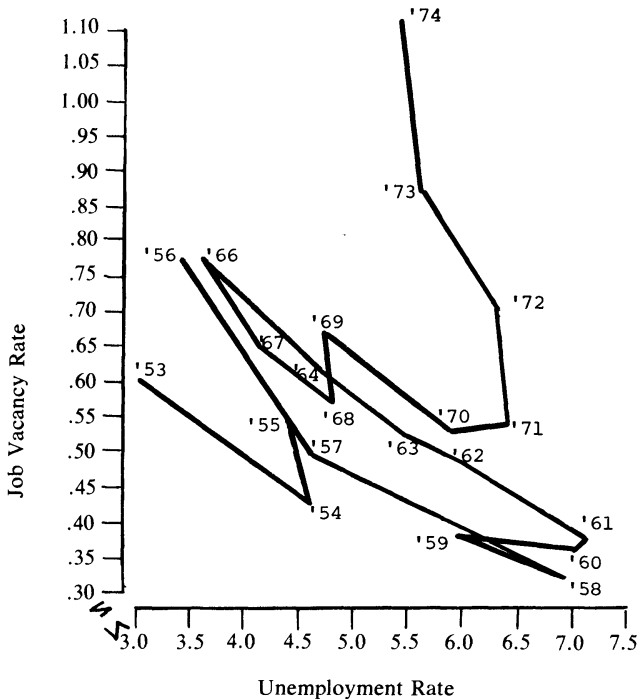
[15] The rather complex merging procedure is described in DENTON, F. T., FEAVER, C. H. and ROBB, A. L., « Patterns of Unemployment Behaviour in Canada », study for the Economic Council of Canada, July 1974, Ch. V.

One additional exercise which is based on unemployment and vacancy data and must also, therefore, be interpreted with caution, examines the occupational dimension of such data for evidence of «mismatching». When unemployed workers are unsuited, because of education, training, experience, occupational background, location, and/ or wage aspirations, for the vacant jobs, then mismatching occurs. Of course, there will generally be some vacancies in any labour market, but the point is that some markets may be experiencing relatively «tight» shortage conditions at the same time that other markets are experiencing relatively «slack» conditions. The following chart reports a «relative tightness ratio» for 22 major occupational groups in 1971.
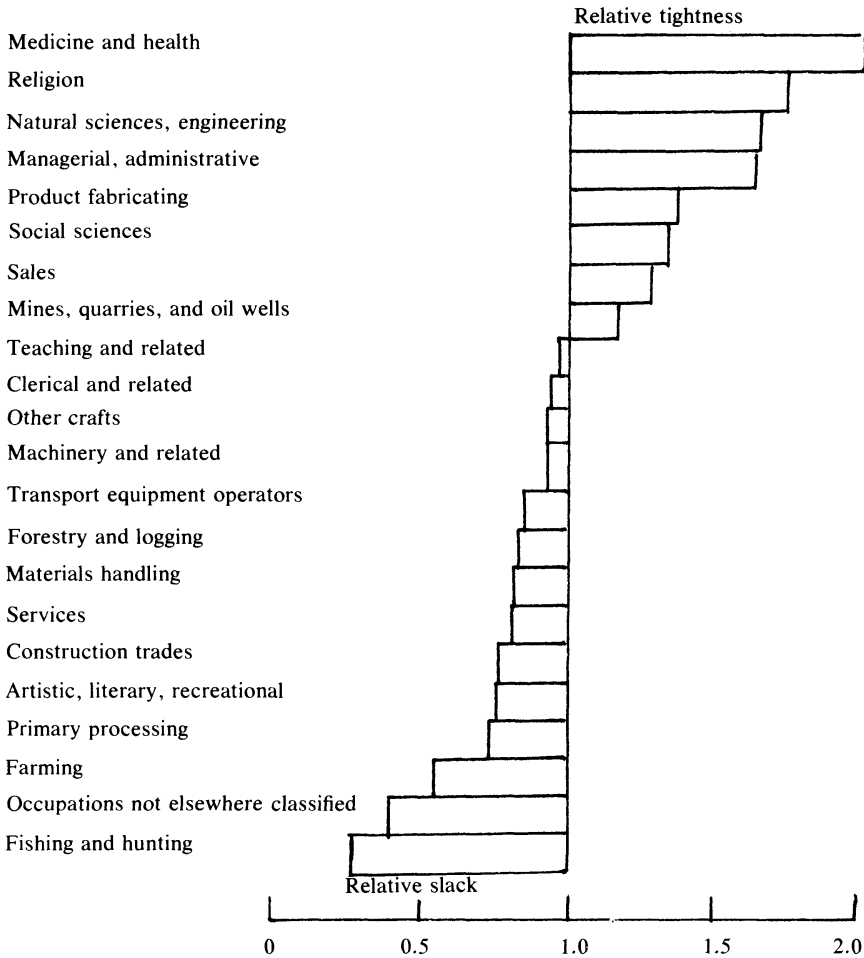
The ratio is:

$$V_i/U_i \div V/U$$

where V_i, U_i are unemployment and vacancies, respectively, for a particular occupation group i, and V, U are total vacancies and unemployment, respectively, for all occupations. Since the ratio of V to U is less than unity for every occupation the overall ratio is normalized by the average ratio for all occupations in order to provide a standard for comparison. The market for an occupational group is therefore relatively tight (slack) when its ratio exceeds (falls short of) a value of unity. These results are shown graphically in Figure 6 where occupations have been ranked from low to high in terms of their relative tightness ratio. Of the 22 major groups examined for 1971, it is apparent that 14 experienced relatively slack conditions while 8 were relatively tight. This simple exercise provides at least tentative illustration of the simultaneous existence of the relative shortage and relative surplus in occupational markets which caracterizes structural maladjustment.

Finally, there is a steadily growing body of liberature which suggests that the Canadian labour market has been experiencing a rather complex set of developments in recent years which render it qualitatively different from the market of even a decade ago, and which impose further adaptive strains upon the allocative mechanism. One such development is the rapidly growing proportions of young people (14-24 years of age), and of women, in the labour force — groups whose labour force attachment is less firm than that of prime-age (25-54 years) males. These developments have important implications for the magnitudes of the gross flows with which the market must deal. In the last section the absolute magnitude of these flows was shown to be large relative to the net change in stocks. In the last decade, moreover, the magnitude of the flows into and out of the labour force has increased, as the following table shows.

FIGURE 6

**Major Occupational Groups Ranked by
Relative Tightness Ratio, Canada, 1971**

Relative tightness

Medicine and health	
Religion	
Natural sciences, engineering	
Managerial, administrative	
Product fabricating	
Social sciences	
Sales	
Mines, quarries, and oil wells	
Teaching and related	
Clerical and related	
Other crafts	
Machinery and related	
Transport equipment operators	
Forestry and logging	
Materials handling	
Services	
Construction trades	
Artistic, literary, recreational	
Primary processing	
Farming	
Occupations not elsewhere classified	
Fishing and hunting	

Relative slack

0   0.5   1.0   1.5   2.0

Source: Data from Meltz, N., « Information Requirements for Government Programs
        Directed Toward the Labour Market », *Study of the Economic Council of
        Canada*, Table 9-1.

TABLE 3

Flows Into and Out of the Labour Force, Canada, 1963 and 1973

	Percentage of Average	
Labour Force During Year		
	1963	1973
Into employment from net in labour force	24.6	28.0
Into unemployment from net in labour force	2.9	4.7
Out of employment to net in labour force	− 25.4	− 29.1
Out of unemployment to net in labour force	− 1.3	− 2.1
Net external population flow into labour force	2.1	2.5

Source: Denton, et al., « Stock Flow Relationships... », op. cit.

CONCLUSIONS

The rather limited data available permit the tentative conclusion of an increasing burden upon the labour-market adjustment mechanism in Canada in the period studied. According to the structural maladjustment case for government involvement in training and other manpower programmes, heavier federal expenditures — given present forms of intervention — would seem to be indicated. However, even if conceptual caveats are set aside, empirical evidence is not conclusive. Several interpretations are possible. If one is convinced by the theoretical arguments as to the efficacy of training programmes to alleviate structural maladjustment, the evidence calls for steps to alleviate what seems to be a growing problem. Alternatively, an anti-training cynic might point out that on the evidence of Figure 5, structural maladjustment in the Canadian labour market has manifested an upward trend throughout the period studied — despite the introduction of an active manpower policy in the 1960s and the rapid build-up of training expenditures in the latter half of that decade. On this view manpower policy has had little or no impact upon the maladjustment problem.[16]

To this argument a more sanguine observer might offer the suggestion that the pace of structural change *is* rapid, and a more severe build-up of structural maladjustment has been avoided only by the relatively large and increasing federal spending on manpower policy in recent years.

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[16] Of course, this still begs the question of whether manpower policy is ineffective and should be scrapped, or whether it has so far proved unequal ot the task only because of the small scale on which it has been operated. For comments on the notion of a critical minimum scale for training programs, see NEWTON, K., « A Counter-cyclical Training Programme for Canada? », *Relations Industrielles,* vol. 26, no. 4, section v.

Whatever the «correct» interpretation, strong conclusions are in any case difficult to draw because of the ambiguous orientation of Canadian manpower policy. That is, manpower training is directed at a variety of goals, some of which may not be completely complementary. It is possible, therefore, that a more spectacular attack upon the problem of structural maladjustment has been blunted somewhat by pursuit, conscious or unconscious, of manpower goals inconsistent with the reduction of maladjustment.