

# Identifying Sources of Imbalance in Individual Labour Markets

## Sources de déséquilibre dans les marchés locaux du travail

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Résumé de l'article

Cet article expose un système qui permet d'examiner le fonctionnement des marchés du travail considérés individuellement en rapport avec l'intervention du gouvernement en l'appliquant à trois occupations précises.

La première partie a pour objet de décrire le fonctionnement de « marchés du travail pris individuellement au moyen de diagrammes simplifiés de l'offre et de la demande d'emploi. Ces diagrammes sont aussi utilisés pour vérifier les effets des programmes de main-d'oeuvre du gouvernement, principalement ceux qui ont été mis au point au Canada depuis le milieu de la décennie "60".

La deuxième partie traite le sujet de l'utilisation des données disponibles permettant d'identifier les sources de déséquilibre des marchés du travail pris individuellement. Le premier stade consiste à choisir les occupations où des déséquilibres notables ont persisté entre l'offre et la demande tel qu'il ressort des statistiques relatives aux personnes à la recherche d'un emploi en regard du nombre des postes vacants. Le deuxième stade consiste à indiquer comment on peut déterminer les foyers de déséquilibre par l'utilisation des statistiques courantes concernant les chercheurs d'emploi et les postes vacants, en tenant compte du nombre des candidats, du temps où ils sont à la recherche d'un emploi, de leur degré de qualification et des taux de salaire.

La troisième partie de l'article applique cette méthode d'investigation à trois occupations dans la région métropolitaine de Toronto: les mécaniciens d'automobile, les opératrices de machine à coudre et les employés d'abattoir. Les deux premières occupations se caractérisent par une abondance de postes vacants alors qu'il y a un surplus d'offres d'emploi dans le cas des employés d'abattoir. Chacun des déséquilibres semblait causer par un ensemble différent de facteurs. Lorsque des recommandations sont faites en vue d'une intervention éventuelle du gouvernement, on note qu'il n'est pas toujours souhaitable au point de vue économique d'essayer de faire disparaître tout déséquilibre sur les marchés du travail. En outre, on remarque que de tels efforts peuvent avoir pour résultat final de perpétuer les déséquilibres réels qu'ils visaient à écarter, principalement dans le cas des marchés du travail où les salaires sont bas.

# Identifying Sources of Imbalance in Individual Labour Markets

Noah M. Meltz

*The objective of this paper is to examine the operation of individual labour markets from the point of view of possible government intervention. The first section sets out a theoretical framework describing the operation of individual labour markets, while the second section develops a two-stage approach for identifying the sources of persistent imbalances in particular labour markets. The third section applies the proposed approach to three occupations in the Toronto area: auto mechanics; sewing-machine operators; and packaging hands. Alternative approaches by government are suggested for dealing with these imbalances.*

During the mid-1960's it was the fashion in both Canada and the United States to stress the primacy of manpower (labour market) policies as the most effective means of shifting the trade-off curve between unemployment and price increases.<sup>1</sup> At that time the unemployment rate in both countries had fallen to levels not achieved since the mid-1950's and the concern was with maintaining a rapid rate of growth while avoiding excessive inflation. In Canada a new federal government department Manpower and Immigration was established to implement manpower policy, and in the words of J.S.

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<sup>1</sup> See: Economic Council of Canada, *Second Annual Review*, Ottawa, Queen's Printer 1965, pp. 117-187, *Third Annual Review*, Ottawa: Queen's Printer, 1966, p. 145 and R. G. LIPSY, «Structural and Deficient Demand Unemployment Reconsidered», in A. ROSS (ed.), *Employment Policy and The Labour Market*, Berkeley, University of California Press, 1965, pp. 210-285.

Dupré, it soon developed its 'Grand Design' for Manpower policy.<sup>2</sup> The Design had as its main objective «... to further economic growth in Canada by endeavouring to ensure that the supply of manpower matches the demand qualitatively, quantitatively and geographically».<sup>3</sup>

The actual implementation turned out to be much less straightforward than was imagined. One of the major difficulties was (and is) that no one really knew the best way to achieve the objective of adjusting supply to demand or in fact whether this was always possible or even desirable.

By the end of the 1960's it was apparent that manpower policies by themselves were not the economic panacea which had been hoped for. Unemployment rates in both the United States and Canada began to rise again and in Canada the figures for 1971 and 1972 were close to the rates of a decade earlier. Moreover, not only had the trade-off curve not shifted to a more favourable position, but in fact Kaliski suggests that it actually worsened.<sup>4</sup> The rate of inflation was greater than it had been in decades and was accompanied by much higher levels of unemployment. At the policy level emphasis shifted away from economic growth and the associated attempt to adjust supply to demand toward equity and stability.<sup>5</sup> At the research level the examination was begun into the microeconomic roots of the trade-off dilemma.<sup>6</sup> This new probing, in which Charles Holt is particularly prominent, led to the consideration of the elements of job search, labour turnover and adjustment time along with the incorporation of the role of labour market information as developed by Stigler<sup>7</sup> and

<sup>2</sup> J. Stefan DUPRÉ, David M. CAMERON, Graeme H. MCKECHNIE, and Theodore B. ROTENBERG, *Federalism and Policy Development, The Case of Adult Occupational Training in Ontario*, Toronto, University of Toronto Press, 1973, pp. 50-53.

<sup>3</sup> Economic Council of Canada, *Eighth Annual Review, Design for Decision-Making: An Application to Human Resources Policies*, Ottawa, Information Canada, 1971, p. 96.

<sup>4</sup> S. F. KALISKI, *The Trade — Off Between Inflation and Unemployment: Some Explorations of Recent Evidence for Canada*, Special Study No. 22, prepared for The Economic Council of Canada, Ottawa, Information Canada, 1972.

<sup>5</sup> Economic Council of Canada, *Eighth Annual Review, op. cit.*, W. R. Dymond suggests that unless there are significant structural problems manpower programs can only be justified at relatively modest levels.: See: «Canadian Manpower Policy: A Policy in Search of a Problem», in *Industrial Relations Research Association Series, Proceedings of the Twenty-Fifth Anniversary Meeting, Toronto, December 28-29, 1972*, edited by Gerald G. Somers, Madison, Wisconsin, 1973, pp. 69-78.

<sup>6</sup> See: E. S. PHELPS, ed. *Microeconomic Foundations of Employment and Inflation Theory*, New York, Norton, 1970.

<sup>7</sup> See: G. S. STIGLER, «Information in the Labour Market», *Journal of Political Economy Supplement*, October 1962, pp. 9-48.

extended by Rees.<sup>8</sup> This new microeconomic work has added much to our conceptual knowledge of the considerations underlying the trade-off but it has not and was not intended to be focused on individual labour markets. The recent work by Feldstein,<sup>9</sup> adds to the efforts of Charles Holt and his Urban Institute colleagues<sup>10</sup> in considering types of labour market programs but there is still a need for criteria to identify individual labour markets which are experiencing problems which may require government intervention in some form. While the benefit-cost criteria are important, they have tended to be applied only to programs operating on the supply side rather than weighing alternative programs which could affect the demand for labour or could affect the operation of the labour market itself. A more fundamental difficulty is to be able to select the appropriate labour markets for policy action in the first place. Unless benefit-cost calculations are available for all labour markets and are updated constantly someone has to select the particular markets with which to begin the benefit-cost comparisons.

The objective of this paper is to examine the operation of individual labour markets from the point of view of possible government intervention. We will first consider the stated objectives of manpower policy in the 1960's in terms of various types of labour market situations. Second, we will introduce a framework for examining the operation of an individual labour market which highlights the major considerations in the market adjustment process. Third, we will outline a two-stage approach for identifying labour markets in which there are persistent and significant imbalances between demand and supply. Finally, we will give some examples of the proposed approach for purposes of illustration. Two conclusions are reached. First, although there are still some serious gaps in labour market statistics, there are enough available data to obtain a reasonable picture of developments in individual labour markets. Second, it is likely to be impossible and perhaps even undesirable to attempt to ensure that the supply of labour always matches the demand in every labour market in a dynamic economy.

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<sup>8</sup> See: Albert REES, «Information Networks in Labour Markets» *American Economic Review*, May 1966, pp. 559-566, and Albert REES and Georges P. SHULTZ, *Workers and Wages in an Urban Labor Market*, Chicago, University of Chicago Press, 1970.

<sup>9</sup> Martin S. FELDSTEIN, *Lowering the Permanent Rate of Unemployment*, A study prepared for the use of the Joint Economic Committee, Congress of the United States, Washington, U.S. Government Printing Office, 1973.

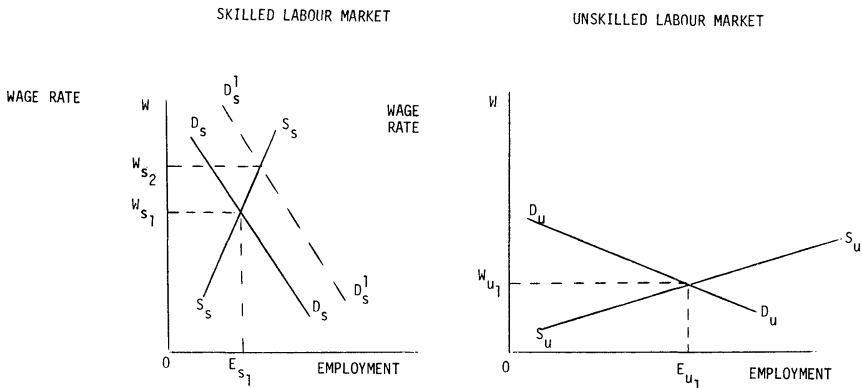
<sup>10</sup> Charles C. HOLT, C. Duncan MACRAE, Stuart O. SCHWEITZER, Ralph E. SMITH, *Manpower Programs to Reduce Inflation and Unemployment: Manpower Lyrics for Macro Music*, Washington, The Urban Institute, 1971.

## MANPOWER POLICY OBJECTIVES AND INDIVIDUAL LABOUR MARKETS

In this section we will examine the implications of manpower policy objectives for individual labour markets using simplified micro-models. A labour market will be defined for purposes of this paper as a combination of occupation and geographical area. The situations depicted deal with an economy containing two occupations, one skilled and one unskilled. There are demand and supply curves for each occupation and the stock of persons with the requisite training or lack of it is given. The labour supply curves represent the flows from these stocks. It is possible for an unskilled worker to acquire the skill but this takes time as well as a certain cost in both foregone earnings and direct expenses on the training. The wage rate represents the only cost per unit of labour.<sup>11</sup> In each market and as between markets we assume that information is perfect and costless and that the markets operate instantaneously to achieve an equilibrium level of employment and wage rate.

Figure 1 presents a simplified version of the labour market situations which seem to have been envisioned by the Economic Council of Canada and the Department of Manpower and Immigration in the mid-1960's. The objective is to achieve equilibrium in all labour markets.

FIGURE 1



<sup>11</sup> See: Albert REES, *The Economics of Work and Pay*, New York, Harper and Row, 1973, pp. 83-88, where he discusses the implications of allowing pension plans and other fixed costs of employment to be included in the cost of labour.

Initially both labour markets are in equilibrium at wage rates  $W_{s_1}$  and  $W_{u_1}$ . As a result of developments in the product market, the demand for skilled workers increases as represented by the rightward shift to  $D_s^1 D_s^2$ . In the absence of any other change the wage rate for skilled workers will rise to  $W_{s_2}$ . Since the supply curve for skilled workers is assumed to be relatively inelastic,  $W_{s_2}$  represents a sizeable wage rate increase over  $W_{s_1}$ . Government authorities fear that this increase in wages could lead to or accelerate cost push inflation.<sup>12</sup> As an alternative to allowing such a substantial wage increase the manpower authorities introduce a training program whose objective is to increase the supply of skilled labour either by shifting the curve  $S_s S_s$  or by making the curve more elastic. The result would be to both reduce the actual size of the wage increase of skilled workers and increase employment of skilled workers.

The increase in the supply of skilled workers could come from several sources. Persons currently employed in unskilled work could be retrained for skilled work. The result would be to shift the supply curve of unskilled to the left, thereby producing some increase in the wage rates of unskilled and reducing the wage differential between skilled and unskilled workers. Second, persons outside the labour force but resident in Canada could be encouraged to undertake training in the skill. The result would be to increase the supply of skilled workers while leaving the supply curve of unskilled workers unchanged. Third, the government could recruit workers from outside the country as immigrants (or as temporary workers) which would have the same impact as encouraging residents who are outside of the labour force to take the training. In the second and third cases unless the supply were increased by the same extent as demand (or the supply curve was made perfectly elastic over the range of the increase in demand) then there would be some increase in the wage differential between skilled and unskilled workers. This increase in differential would be less than would occur in the absence of a program drawing on persons outside the labour force. In all three cases output would be permitted to increase with less upward pressure on prices since wage rate increases (particularly the rates of more skilled and highly-paid workers) would be moderated. This would seem to have been the primary objective of Canadian manpower policies in the second half of the 1960's.

There is no reason to assume that the labour sector contains only the market situations shown in Figure 1. Even if we restrict the economy

<sup>12</sup> For the necessary conditions for this to happen see: W. G. BOWEN, *The Wage Price Issue*, Princeton, New Jersey, Princeton University Press, 1960, pp. 387-411.

to two labour markets, there are a number of additional possibilities. These are depicted in Figures 2, 3 and 4. Labour markets which are characterized by either monopsony or monopoly could also be depicted. As Devine suggests, the presence of such elements could lead to continued imbalances between supply and demand.<sup>13</sup> These two cases are not included in the discussion in this section since they do not alter the conclusions or the approach which is suggested below.

Figure 2 presents a situation where there is a collectively bargained wage for skilled workers which lies above the pre-existing equilibrium wage. In the case of unskilled workers, there is a government-set minimum wage which lies above the equilibrium wage in the market for unskilled labour. The result is an excess supply of labour in each labour market which will not be eliminated in the short run through changes in wage rates because there is no effective pressure on the wage rates to change. In this case government manpower training programs cannot eliminate the excess supplies of labour. The only way programs operating on labour supply could eliminate the excess supply would be to reduce labour supply through encouraging workers to leave each labour market and the labour force. Other alternatives are available. The government might attempt to increase the demand for labour through aggregate or selective policies. A third alternative, of course, would be to remove the minimum wage and prevent the establishment of collectively-set wage rates. This last approach is virtually ruled out by present viewpoints although Feldstein has suggested some ways of getting around the impact on low productivity youth by means of an Employee Investment Tax credit.<sup>14</sup>

Figure 3 presents the case of an excess supply of labour in the market for skilled workers and an excess demand for labour in the market for unskilled workers. The excess supply of skilled workers results from a collectively-bargained wage rate above the intersection of the original demand and supply curves. The excess demand arises from the fact that the demand curve is very elastic at the existing wage rate. Such a situation could arise in industries where there is little capital required and each (usually small) entrepreneur believes that he could make a normal profit on additional workers hired at the going wage rate. Were this situation to persist for a long time it is likely that some of the skilled workers who did not obtain skilled jobs would

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<sup>13</sup> E. J. DEVINE, «Manpower Shortages in Local Government Employment», *American Economic Review*, May 1969, pp. 538-545.

<sup>14</sup> FELDSTEIN, *op. cit.*

accept unskilled jobs while at the same time seeking a skilled job. The effect would be to increase the supply in the unskilled labour market with only a small decrease, if any, in the supply of labour to the skilled market. A government manpower program could increase the supply of unskilled labour through immigration. A training program would have no impact on the skilled market. Only an increase in demand for skilled workers would remove the excess supply. It should be noted that in both markets in the short-run, the imbalances will not be automatically eliminated because there is no effective pressure on the wage rates to change.

FIGURE 2

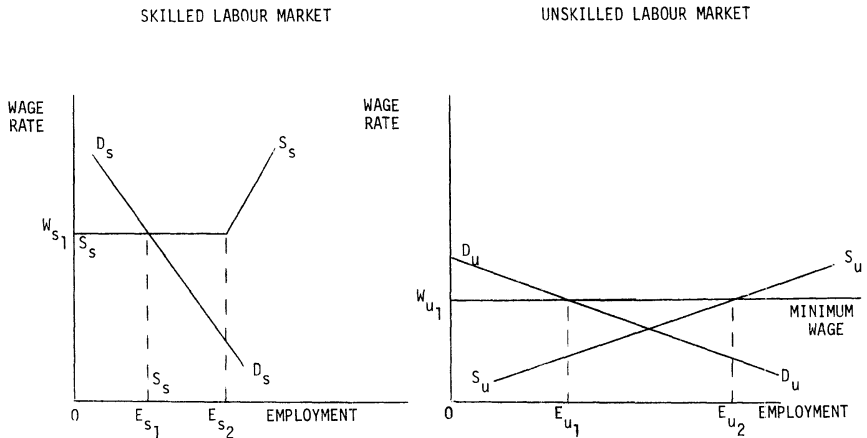


FIGURE 3

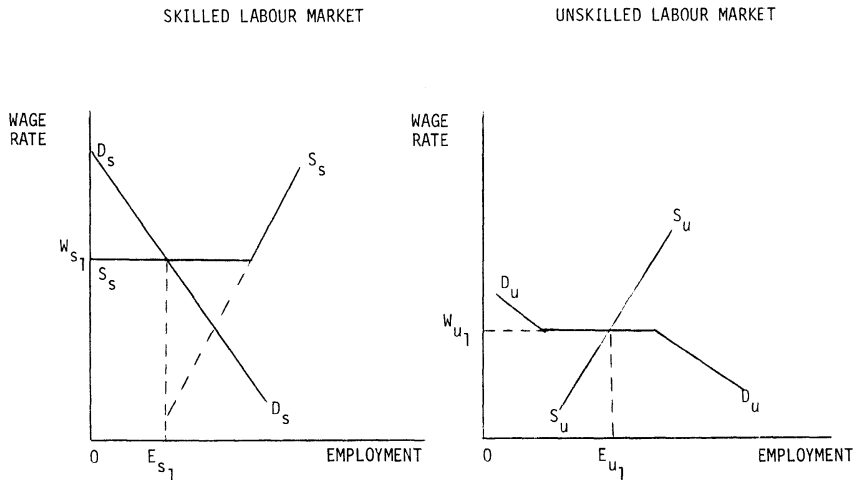
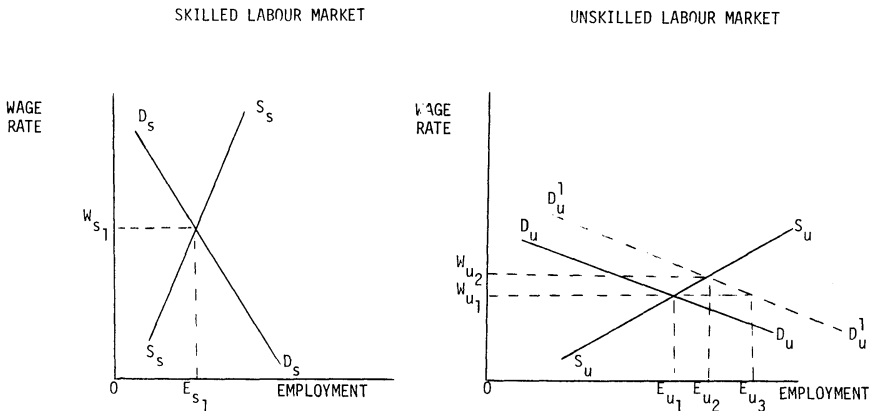




Figure 4 is similar to Figure 1 with the exception that the increase in demand is for unskilled labour instead of skilled. In order to hire additional labour, employers must increase their wage rates. Because the supply curve is more elastic than was the case for skilled workers, the required increase is less than for skilled workers. Employers are prepared to hire  $OE_{u_3}$  workers at the initial wage rate whereas they will hire a smaller number  $OE_{u_2}$  at a wage rate of  $W_{u_2}$ . If the government wants to prevent wages from rising in this sector and at the same time increase the quantity supplied at the initial wage rate, then the only source would be to recruit immigrants or induce persons not in the present labour supply to enter the labour market for unskilled.

FIGURE 4



The preceding discussion suggests that labour supply can only be adjusted to labour demand in certain market situations. In other cases labour supply programs will have little impact on the particular labour markets although the persons involved in the programs will be affected (particularly through the training allowances). In these cases programs directed toward the demand side and/or the operation of labour markets will be necessary in pursuing the goals of raising standards of living, equity in the distribution of income and stabilizing economic performance.<sup>15</sup> Labour market imbalances can serve as a starting point for determining which government program can assist in working toward these goals.

A final point concerns the questions of the costs of government intervention in relation to the benefits. If the supply of labour is not

<sup>15</sup> See: Economic Council, *Eighth Annual Review, op. cit.*, p. 89.

moving over time from lower wage to higher wage occupations on its own, then private costs of such a move must exceed the private benefits. The only case for government intervention would be the existence of externalities such that social benefits would exceed social costs even though private costs exceed private benefits. Such a formulation would ensure government intervention only where society as a whole would gain and the gain would not occur in the absence of government intervention. In order to determine what these circumstances are, benefit-cost calculations have to be made on programs dealing with both the supply and the demand sides of the labour market. There has been a lot of discussion and a number of efforts to measure benefits and costs on the supply side particularly with regard to action on the demand side or the results of a lack of intervention on either side do not seem to have been considered.

In order to assess benefits and costs there has to be a complete understanding of how the individual labour markets operate and what aspects of the market process may be affected by government intervention on either the supply or demand side. This is the subject of the next section.

#### A FRAMEWORK FOR EXAMINING THE OPERATION OF INDIVIDUAL LABOUR MARKETS

In the discussion in the preceding section we assumed that perfect and costless information in labour markets existed and that the markets operated instantaneously to achieve an equilibrium level of employment and wage rates. There were also no barriers to mobility between labour markets except the cost of acquiring a skill.

When we observe individual labour markets in action several facts are noted.

1. There is usually a dynamic situation where employment is changing over time as are absolute wage rates and to some extent relative wages.

2. In addition, in virtually every labour market there are continual and significantly-large changes within demand and supply resulting from turnover of jobs and workers. This turnover occurs even in those situations where there are no observed changes in the number of persons employed or unemployed.

3. Labour market adjustments do not occur instantaneously but instead we find vacancies and job seekers co-existing for (often different)

periods of time due to information gaps and costs, exaggerated expectations and uncertainties, barriers to mobility other than training costs as well as the continual turnover mentioned above<sup>16</sup>. Even in periods of generally high unemployment unfilled vacancies occur side by side with unemployed job seekers as well as employed job seekers. The unemployment arising from this adjustment process is considered to be frictional unemployment.<sup>17</sup>

4. Wage rates vary within a labour market (that is for the same occupation and geographical area) and vary among different industries and for different characteristics of the workers including length of service. On the other hand there does seem to be some general stability in the ranking of most occupations in terms of average earnings.

Figure 5 has been developed to describe the adjustment process in individual labour markets taking account of the existence of imperfect information, lack of instantaneous adjustments and the dynamic nature of labour markets. The diagram is an expanded version of the process outlined by Holt and David<sup>18</sup> in which job seekers and vacancies come together over time through downward revisions in the expected wage rate on the part of job seekers, upward revisions in the wage rate firms are prepared to pay, and/or downward revisions in the quality of labour (skill level) firms will accept. Several modifications have been made in the Holt and David training diagram. First, the possible sources of job seekers and vacancies have been included along with unemployed and employed job seekers. Second, a rectangular area has been added to represent the predominant range of wage rates and quality of labour over which the successful matching of vacancies with job seekers takes place. This range will of course change over time depending on the demand and supply conditions in this labour market and in related labour markets. Third, the options open to job seekers have been expanded to include the enhancement of their quality through training as well as lowering their wage expectations. Fourth, an additional option is open to both job seekers and vacancies of

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<sup>16</sup> See: WOODS and SOMERS, *North American Conference on Cost — Benefit Analysis of Manpower Policies, Madison Wisconsin 1969*, Proceedings. G. G. SOMERS and W. D. WOOD editors, Kingston, Ontario, Industrial Relations Centre, Queen's University, 1969.

<sup>17</sup> See: M. W. REDER, «The Theory of Frictional Unemployment», *Economica*, February 1969, pp. 28.

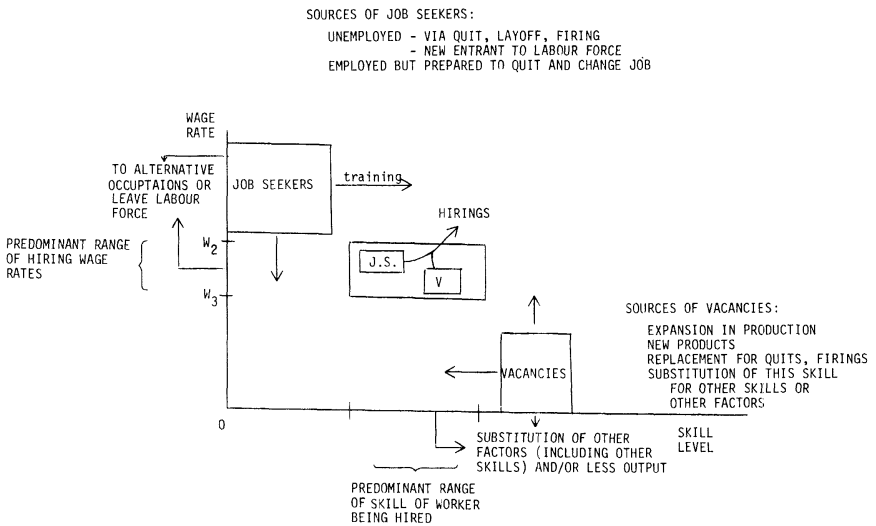
<sup>18</sup> C. C. HOLT and M. H. DAVID, «The Concept of Job Vacancies in a Dynamic Theory of the Labour Market», in National Bureau of Economic Research, *The Measurement and Interpretation of Job Vacancies*, New York, 196, pp. 73-110.

leaving this particular labour market and entering other labour markets or withdrawing entirely. The particular options which are exercised depend on the demand and supply situation in this market relative to available alternatives when account is taken of benefit and cost considerations.

Two other possibilities could arise. Job seekers and vacancies may in fact be in the predominant hiring range but not know of each others existence. This means that lack of information provides a barrier to the matching of vacancies and job seekers. This possibility could be represented diagrammatically by a third plane in Figure 5 in which both vacancies and job seekers overlap in the two dimensions shown in the diagram but are separated in the third dimension. The two could be brought together through improvement in information. Consideration of the costs and benefits of information would enter here.<sup>19</sup>

FIGURE 5

Simplified Flow Diagram of an Individual Labour Market



One last possibility might be mentioned. Job seekers may have higher qualifications than the employers require or are prepared to pay for. In Figure 5 this would be represented by the job seeker rectangle lying above and to the right of the predominant hiring range while vacancies lie below and possibly to the left of the predominant hiring

<sup>19</sup> See: STIGLER, *op. cit.*, and REES, *op. cit.*

range.<sup>20</sup> In this case the adjustment process may produce a matching if workers are prepared to accept lower wages. On the other hand employers may not want to hire over-qualified workers. In this case the job seekers would eventually have to leave the particular labour market unless new jobs were created utilizing more qualified workers.

When an understanding of the dynamic aspects of the operation of an individual labour market are combined with the knowledge of the behaviour of labour markets assuming static conditions or comparative statics we are in a better position to see what would have to be done and whether it is in fact possible to achieve a balance between quantity of labour demanded and supplied in a labour market.

#### PROPOSED APPROACH

In this section we develop a two stage approach for identifying and examining individual labour markets in which there have been persistent and significant imbalances. As a starting point for research on individual labour markets we suggest the use of data collected by Canada Manpower Centres on vacancies and unplaced job seekers by occupation class. These data are collected at the end of each month on form MAN. 757.<sup>21</sup> There are a number of advantages and disadvantages in using CMC data as the base. The primary advantages are the amount of occupation detail and geographical breakdowns which can be obtained on a month by month basis for several decades. In addition, the published or circulated data can be supplemented by information, including some data from the CMC files on job seekers and job orders. The Job Vacancy Survey undertaken by Statistics Canada can be used to provide an overview and control against which to compare the CMC vacancies data. The JVS data have so far only been released for major occupation groupings except in one case where detailed data were given to Canada as a whole.<sup>22</sup> I understand that Statistics Canada plans to

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<sup>20</sup> This alternative possibility was suggested by Mr. John Withrow, an undergraduate student in my labour economics course at the University of Toronto, in the academic year 1973-74.

<sup>21</sup> The types of data which are available are discussed in the following reports by the author: *Study of Labour Market Information Systems, Final Report*, Ottawa: Department of Manpower and Immigration, June 21, 1968. *An Exploratory Study of Three Occupations in the Toronto Industrial and Trades Canada Manpower Centre*, Ottawa: Department of Manpower and Immigration, April 1970.

<sup>22</sup> See: *Quarterly Report on Job Vacancies*, Third Quarter 1973, Statistics Canada, Ottawa: Catalogue 71-002 and David Gower, «The Occupational Composition of Job Vacancies», in the *Canadian Statistical Review*, April 1973, Statistics Canada Publication No. 11-003, Monthly Volume 48, No. 4, pp. 4, 118-123.

release additional detailed occupation data and to include starting wage rates. A wealth of detailed occupation data on Unemployment Insurance claimants is now being tabulated and this data can be used as a control on the CMC job seekers data as well as a source of low data on job seekers.

The primary disadvantage of using the CMC data is the uncertainty concerning the extent and consistency of the occupations covered by the data as well as the reliability. Sylvia Ostry commented several years ago on the fluctuations in the CMC (then called National Employment Service) data.<sup>23</sup> From my own explorations it would appear that in general Job Vacancy Survey and the CMC data produce a similar ranking of job vacancies by occupation. The major exceptions would arise from the smaller coverage of CMC's in the managerial, professional and to some extent clerical fields.

As a starting point for an exploration of individual labour markets the advantages of using the CMC data offset the disadvantages, particularly when the disadvantages can be reduced by relating CMC data for each occupation for Canada as a whole to the Job Vacancy Survey Data.

### **Stage 1: A Framework for Screening Labour Markets**

The first stage in the proposed approach involves identifying occupations in which there have been persistent imbalances either excess demand or excess supply. We would have liked to include labour markets in which a much longer time than is usual is required to bring supply and demand together. Data are not presently available to enable us to pursue this approach. Excess demand is measured by the number of vacancies exceeding the number of unplaced job seekers and excess supply is the reverse. Unplaced job seekers could include only unemployed job seekers or both employed and unemployed seekers. In Figure 5 above I have included all job seekers but for the screening model I suggest the use of unemployed job seekers. Ideally at the first stage we would want to narrow the comparison to those vacancies and job seekers which fell within the predominant hiring range for wage rate and skill level in accordance with Figure 5. Unfortunately the data presently available from CMC's Form MAN.757 do not contain wage rate or skill level information.

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<sup>23</sup> Sylvia OSTRY, «Discussion» in National Bureau of Economic Research, *The Measurement and Interpretation of Job Vacancies*, New York, 1966, pp. 306-313.

As noted above data on the hiring wage rates of unfilled vacancies will soon be available through the Job Vacancy Survey. This will provide a gold mine of information on labour markets. Since some of the employed job seekers may be above the predominant range we have decided to exclude them from the initial screening of labour markets.

The appropriate time period for identifying imbalances which have become persistent would differ from occupation to occupation and would depend on the usual length of time required to recruit people into the particular occupation and an examination of the history of the relationship between vacancies and unemployed for each occupation. An excess demand which persisted for several years or on a regular seasonal basis would normally call for additional examination as would several years of excess supply in a particular occupation. Various criteria could be used to determine how large an imbalance has to be considered significant. In the study discussed below we used the absolute size of the imbalance. Another criteria could be the size of the imbalance relative to the number employed in the market. In preparing the historical patterns of vacancy-unemployed relationships consideration would have to be given to general level of unemployment at the various points in time. Although a more complicated analysis could be undertaken I would propose that initially a simple comparison be made between trends in the number of unemployed in the particular occupational labour market and the number or percentage of the labour force unemployed in the metropolitan area or the province.<sup>24</sup>

Although it might seem that stage I would involve an enormous amount of work just to sort out the markets with significant problems, in fact the task is much easier. In my study of CMC operations I found that much of the activity is concentrated in a few occupations. For example in the Toronto Industrial and Trades Canada Manpower Centre, which is the largest CMC in Canada, three quarters of the vacancies in jobs for women in June 1969 were in only five occupations. For men vacancies in the five largest occupations accounted for 21 percent of the total. The five largest occupations for unemployed job seekers accounted for 35 percent of the men and 49 percent of the women.<sup>25</sup>

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<sup>24</sup> For a proposal for the development of small area unemployment rates see: Frank DENTON, «Project to Estimate Small Area Unemployment Rates», memorandum prepared for the Dominion Bureau of Statistics, Ottawa, 1966.

<sup>25</sup> See: Noah M. MELTZ, *An Exploratory Study of Three Occupations*, *op. cit.*, pp. 46-47.

The next part of stage I involves calculating change in the starting wages in the selected occupations as compared with overall averages and if possible earnings in related occupations. As a starting point forthcoming data from the Job Vacancy Survey on hiring wage rates could be used.

The Canada Department of Labour's annual survey of wage and salary rates is the only fairly comprehensive source of wage data at present but it suffers from a number of inadequacies including a lack of relevance to data on employment by occupation. By considering the number of vacancies and unplaced job seekers together with changes in starting wages relative to the overall average wage change we can begin to get some idea of what is happening in particular labour markets.<sup>26</sup> Normally we would expect a situation of excess demand to be followed by increases in relative wages.<sup>27</sup> This in turn would be followed by increases in the quantity of labour supplied and decreases in the quantity demanded which would restore the equilibrium. The reverse would occur when there is excess supply. If this is not the case then there would appear to be certain impediments to operation of the labour market.

### **Stage 2: Identifying Sources of Imbalance in Labour Markets**

The purpose of stage 1 is to pinpoint those labour markets which have been experiencing persistent imbalances. The purpose of stage 2 is to examine the operation of the particular labour market using the framework provided in Figure 5 in order to identify the source or sources of the imbalance in the labour market. Once this has been done consideration can be given to possible programs to correct the imbalance. As noted earlier the appropriate policy which could include

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<sup>26</sup> For some examples of the use of wage data as an indicator of changes in the market situation, see: R. R. KERTON, *Active Manpower Program in Canada*, Prices and Incomes Commission, Ottawa; Information Canada, 1973, pp. 13-21, G. ROSENBLUTH, «Wage Rates and the Allocation of Labor», *Canadian Journal of Economics*, Vol. 1, August 1968, pp. 566-582. Noah M. MELTZ, *Changes in the Occupational Composition of the Canadian Labour Force 1939-1961*, Occasional Paper No. 2. Economics and Research Branch, Canada Department of Labour, Ottawa; Queen's Printer 1965. All of the above use wage changes together with changes in employment or the distribution of employment (labour force) rather than vacancy and unemployment data.

<sup>27</sup> For a discussion of why increases in relative wages may not always occur see: K.L. ARROW and W.M. CAPRON, «Shortages and Salaries: The Engineer-Scientist Case in the United States», in M. BLAUG, ed., *Economics of Education*, selected readings, Penguin Modern Economics, 1968, pp. 318-337, originally in *Quarterly Journal of Economics* 1959.



taking no action at all, should be judged on the basis of a benefit — cost approach to all of the possible actions. Our task here is not to deal with the appropriate manpower programs but with a method of laying out the sources of the imbalances which could subsequently be subject to policy scrutiny.

In stage 2 particular flow data would be prepared from CMC and Unemployment Insurance records.<sup>28</sup> These data would include: the number of job vacancies received in an occupation during a month and the number of job seekers, the average length of time it took to fill jobs and to place workers and the average length of time of unfilled vacancies and unplaced job seekers, the wage rates of jobs, the location, and any special requirements. The same type of information could be recorded for job seekers including any restrictions on location or work, hours, pay, background experience, training, work history, etc. Other factors could be identified such as status and career opportunities. These data would provide the dynamics of the operation of the particular labour market. In addition one would need to examine the extent and source of changes in supply and demand to the occupation as well as the actual number working in the occupation. If the occupation usually requires a particular type of training or education then data on gross additions to supply can be obtained from information on graduations from schools or training courses as well as data on the intended occupation of immigrants. Data on employment by occupations are being developed by Statistics Canada in the Occupation Employment Survey. In order to get at the sources of demand data on employment and vacancies by occupation would have to be linked back to production functions and demand for goods and services.<sup>29</sup> A final piece of information concerns short-run elasticities of substitution among different kinds of labour and alternative occupations open to persons in a particular labour market. With few exceptions<sup>30</sup> we have little information on either of these subjects.

<sup>28</sup> Data on turnover in the particular labour market would be most useful but are unavailable. Up to 1966 the Survey of Hirings and Separations published by the Dominion Bureau of Statistics provided gross turnover data by industry. No occupation data were prepared and there was no breakdown showing the cause of the hirings or the separations. Statistics Canada is examining the possibility of preparing turnover data from Unemployment Insurance Records.

<sup>29</sup> For an example of an attempt to examine the impact of changes in output, productivity and occupation structures of industries on the overall distribution of employment by occupation see: MELTZ, *Changes in the Occupational Composition of the Canadian Labour Force 1931-1961*, *op. cit.*

<sup>30</sup> For an example see: Michael SKOLNIK, «An Empirical Analysis of Substitution Between Engineers and Technicians in Canada», *Relations Industrielles Industrial Relations*, Volume 25, Number 2, April 1970, pp. 284-302.

On the basis of the historical patterns of vacancy — unemployed relationships, plus the detailed additional information applied to the framework in Figure 5 we will have a better understanding of what has been happening in the particular labour market under discussion. In order to decide on policy approaches we must have some idea of the benefit and costs of alternative programs which might be applied to the particular labour market. In addition we will have to estimate the likely situation in the market in the absence of any new government intervention. The further into the future one moves the less reliable the projection.<sup>31</sup> The integration of manpower projections with current and on-going labour market development is a major gap in the assessment of manpower requirements and supplies. The two-stage approach suggested here could provide a means to link the assessment of current and future labour market developments.

### THREE EXAMPLES OF THE USE OF DATA ON INDIVIDUAL LABOUR MARKETS

In an earlier study for the Department of Manpower and Immigration the author examined three labour markets in Toronto: automobile mechanics, packaging hands, and sewing machine operators. The examination focused on data available through Canada Manpower Centre records. The first market consisted almost exclusively of males while women made up the bulk of job seekers as packaging hands and sewing machine operators.<sup>32</sup> In each case the vacancy — unemployed job seekers situation was examined along with wage rates and flow data on job orders, unemployed job seekers, referrals and placements. For female sewing machine operators vacancies exceeded unemployed job seekers in 10 of the 13 months from June 1968 to June 1969 as shown in Table 1. At the end of June 1969 there were 241 unfilled vacancies and 67 unemployed job seekers. For female packaging hands the number of unemployed exceeded the number of vacancies in all of the 13 months up to June 1969. At the end of June 1969 there were 622 unemployed job seekers and 10 unfilled vacancies.

For automobile mechanics (the group title is motor vehicle repair) the number of unemployed job seekers exceeded the number of vacancies throughout the thirteen months under discussion. On closer examination it turned out that there were really two markets, one for

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<sup>31</sup> See: Economic Council of Canada, *Eighth Annual Review*, *op. cit.*, pp. 123 and 131.

<sup>32</sup> See: MELTZ, *An Exploratory Study of Three Occupations*, *op. cit.*

TABLE 1

**Number of Persons Without Employment and Unfilled Vacancies Registered  
at the Toronto Industrial and Trades Canada Manpower Centre  
at the End of Each Month from June 1968 to June 1969  
in Selected Occupations**

Occupation DOT Code Title	1968												1969													
	June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Apr.		May		June	
	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V	WE	V
620-625 Motor vehicle repair	135	17	175	11	116	6	128	28	181	31	144	19	125	35	147	18	137	12	140	10	132	36	128	27	107	32
786-787 Sewing Machine Operators (female)	91	111	91	140	75	169	85	42	72	130	82	77	85	89	104	132	132	124	89	101	64	131	51	141	67	241
920 Packaging Hands (female)	442	34	446	41	260	70	219	94	375	64	307	57	345	30	449	0	394	5	331	4	556	22	438	16	622	10

NOTE: WE — Persons Without Employment  
V — Unfilled Vacancies

SOURCE: Noah M. Meltz, *An Exploratory Study of Three Occupations in the Toronto Industrial and Trades Canada Manpower Centre*, prepared for the Department of Manpower and Immigration, Ottawa, April 1970, pp. 42 and 44.

licensed mechanics and one for workers with provisional, that is, temporary licences. There was excess demand in the market for licensed mechanics and excess supply in the market for provisionals. Most of the mechanics with provisional licenses were recent immigrants.<sup>34</sup> The average wage rates for automobile mechanics (June 1969) was \$3.25 to \$3.50 per hour in good shops for licensed mechanics; \$2.00 to \$2.25 in poor shops using mostly «provisionals», and \$2.50 to \$2.75 in medium shops where there was a mixture of licensed and provisionals. From a manpower policy point of view the licensing requirements and procedure would seem to be one area worth examining if the objective were to move toward equilibrium in this market.

Packaging hands were receiving \$1.30 to \$1.40 per hour which was just above the then-prevailing minimum wage. Most vacancies were filled in a day or so and vacancies which were unfilled resulted from special factors such as the firm's location, hours etc. Vacancies had been open for an average of a week and a half. The job seekers were mostly married women who would take a job, in this case an unskilled job, if they got the hours, pay and location they wanted. I was told that single women didn't stay in the files too long. Table 2 shows that although there were only 10 vacancies unfilled at the end of June 1969, 63 vacancies had been filled during the month. The model that most closely approximates this labour market is the market for unskilled in Figure 2. It would appear that the minimum wage rate was above the rate which would bring demand and supply into equilibrium. One-third of packaging hands were recent immigrants compared with two-thirds for auto mechanics and close to 100 percent for sewing machine operators. From a manpower policy point of view, there are two main alternatives. One approach would be to take no action since the magnitude of the excess supply is likely the result of the minimum wage encouraging greater labour force participation than would have occurred in its absence. An alternative would be to explore the possibility that lack of information was preventing these women from exploring other occupations which they would perform and for which jobs were available.

Turning to sewing machine operators we find the reverse situation of vacancies exceeding unemployed job seekers. The average wage of

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<sup>33</sup> The case of male sewing machine operators is slightly different. There were fewer job vacancies and job seekers but the number of vacancies exceeded the number of job seekers in 4 of the 13 months compared with 10 for females. See: *ibid.*, pp. 41-42 and 44.

<sup>34</sup> *ibid.*, p. 52.

the unfilled vacancies was slightly higher than that for packaging hands, \$1.50 to \$1.60 an hour vs \$1.30 to \$1.40. During June 1969, 51 vacancies were filled and the average length of time for filling vacancies was one to two weeks while unfilled vacancies had been on the books for an average of two months. Most of the job seekers were recent immigrants. The difference in wage rates was apparently not sufficient to induce any of the unemployed packaging hands to enter the market for sewing machine operators. The model which most closely approximates the labour market for sewing machine operators is that of unskilled labour in Figure 3. One would assume that there is a very elastic demand for the occupation because of a persistent excess of vacancies over job seekers coupled with the continuance of a low and unchanging wage rate in the occupation. In both September 1971 and September 1972 (the only dates for which detailed data are available) the largest number of vacancies in Canada was sewing machine operators.<sup>35</sup> Several questions arise for manpower policy. In the past, manpower policy, through both training and immigration, has drawn sizeable numbers of persons as sewing machine operators. The fact that vacancies still persist and that wage rates are low suggests that few of the persons recruited for the occupation tend to remain a long time. Turnover must be high with most women leaving the occupation. Apparently policies directed to the supply side will never bring this market into balance for long unless there is a major recession. The choice would seem to be that of attempting to improve productivity and/or enable the increase in prices of the final product or on the other hand allowing the excess demand to persist until the market has worked itself out. In fact it may be that previous government intervention to increase the supply of labour through training and immigration has prolonged the time for the necessary adjustment to take place. As discussed in section 1. above, there may be no necessary reason why the government should attempt to reduce shortages in this or other low wage markets through policies designed to increase the supply of labour for low wage occupations.

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<sup>35</sup> See: David GOWER, *op. cit.*: The most recent detailed occupation data released by the Job Vacancy Survey shows that sewing machine operators code 8563 is still the largest single detailed (four digit) occupation class for vacancies. At the three digit level food and beverage preparation and related service codes 612 and sales, commodities code 513/514 each contained 5,300 vacancies which was somewhat more than the 4,800 vacancies for fabricating assembling and repairing: textile, fur and leather products, code 855/856 which included sewing machine operators. See: *Quarterly Report on Job Vacancies*, Third Quarter 1973, Statistics Canada, Ottawa January 1974, cat. 71-002 (Quarterly), Tables 2A and 2B, pp. 8-9.

TABLE 2

Selected Data on Vacancies and Persons without Employment  
Registered at the Toronto Industrial and Trades Canada Manpower Centre

	<i>Motor Vehicle Repair (Auto Mechanic)</i>	<i>Female Sewing Machine Op.</i>	<i>Female Packaging Hands</i>
1. Number of persons without employment at the end of June 1969	107	67	622
2. Number of unfilled vacancies, end of June 1969	32	214	10
3. Duration of majority of unfilled vacancies	4 months	2 months	1-1/2 weeks
4. Number of vacancies filled during June 1969	9	51	63
5. Average length of time to fill job orders during June 1969	2-3 weeks	1-2 weeks	less than 1 wk.
6. Average wage rates in unfilled vacancies	\$3.30 per hour	\$1.50-1.60 per hour	\$1.30-1.40 per hour

Source: See Table 1.

There is one final point arising out of Table 2. There appears to be little relationship between stock data on vacancies and flow data. The largest group of unfilled vacancies were for sewing machine operators with 214 vacancies at the end of June 1969 compared with 32 vacancies for auto mechanics and 10 for packaging hands. The actual number of vacancies which were filled during the month was quite different. The largest number of vacancies filled were the 63 persons obtaining jobs as packaging hands followed by 51 sewing machine operators and 9 auto mechanics. Orders for packaging hands were filled in a few days at most and those vacancies for sewing machine operators were filled in one to two weeks. The unfilled vacancies for sewing machine operators had been on the books for two months. In the case of auto mechanics the orders which were filled had only been on hand two to three weeks while those unfilled had been around for four months. A selection process may be occurring whereby «better» jobs come in and are filled quickly while «poorer» jobs in the same occupation category take a much longer time to fill, or may not be filled at all.

## CONCLUSIONS

In this paper we have developed a framework for examining the operation of individual labour markets from the point of view of possible government intervention. The theoretical framework consisted of the simplified supply-demand model plus a diagrammatic scheme suggesting the dynamic operation of an individual market. A two-stage approach was suggested for utilizing available data to identify the sources of imbalance in individual labour markets. The first stage was to determine those occupations in which there was significant imbalance either unemployed job seekers exceeding vacancies or vacancies exceeding unemployed job seekers. It was suggested that this imbalance should have persisted for some time, say a year or two, or on a regular seasonal basis. Data on vacancies and unemployed job seekers are available for Canada Manpower Centre areas. The second stage involved identifying the sources of imbalance. It was suggested that flow data on vacancies and job seekers be obtained from CMC and UIC records along with data on the length of time it took to fill jobs and place seekers as well as the length of time unfilled vacancies and unplaced seekers had been on file. Other data would include the skill level of the vacancy and the job seeker and location of each group. All of this information could be used to describe the operation of the particular labour market using the diagram contained in Figure 5. Armed with this information manpower authorities should be in a better position to determine what action if any is required in the case of a particular market imbalance. The final section of the paper discussed the operation of the labour markets for three occupations in Toronto in 1969: auto mechanics, sewing machine operators, and packaging hands. Applying the framework for analysis developed in the paper provided a basis for suggesting appropriate program considerations for removing at least some of the imbalance in the case of auto mechanics. A part of the excess supply of packaging hands might be removed through the provision of information on other occupations. In the case of sewing machine operators it was suggested that the excess demand might be reduced through programs directed to improve productivity or raise the price for final products. An alternative which should be considered is to allow the market for sewing machine operators to work itself out which may mean the continuance of a situation of a large number of unfilled vacancies. The same would hold for most of the excess supply of packaging hands. As more information and analysis becomes available on the dynamics and inter-relationships among individual labour markets we will be better able to diagnose the sources of

imbalance and hopefully better able to suggest what action, if any, would be appropriate to deal with the imbalance.

### **Sources de déséquilibre dans les marchés locaux du travail**

Cet article expose un système qui permet d'examiner le fonctionnement des marchés du travail considérés individuellement en rapport avec l'intervention du gouvernement en l'appliquant à trois occupations précises.

La première partie a pour objet de décrire le fonctionnement des marchés du travail pris individuellement au moyen de diagrammes simplifiés de l'offre et de la demande d'emploi. Ces diagrammes sont aussi utilisés pour vérifier les effets des programmes de main-d'œuvre du gouvernement, principalement ceux qui ont été mis au point au Canada depuis le milieu de la décennie "60".

La deuxième partie traite le sujet de l'utilisation des données disponibles permettant d'identifier les sources de déséquilibre des marchés du travail pris individuellement. Le premier stade consiste à choisir les occupations où des déséquilibres notables ont persisté entre l'offre et la demande tel qu'il ressort des statistiques relatives aux personnes à la recherche d'un emploi en regard du nombre des postes vacants. Le deuxième stade consiste à indiquer comment on peut déterminer les foyers de déséquilibre par l'utilisation des statistiques courantes concernant les chercheurs d'emploi et les postes vacants, en tenant compte du nombre des candidats, du temps où ils sont à la recherche d'un emploi, de leur degré de qualification et des taux de salaire.

La troisième partie de l'article applique cette méthode d'investigation à trois occupations dans la région métropolitaine de Toronto: les mécaniciens d'automobile, les opératrices de machine à coudre et les employés d'abattoir. Les deux premières occupations se caractérisent par une abondance de postes vacants alors qu'il y a un surplus d'offres d'emploi dans le cas des employés d'abattoir. Chacun des déséquilibres semblait causer par un ensemble différent de facteurs. Lorsque des recommandations sont faites en vue d'une intervention éventuelle du gouvernement, on note qu'il n'est pas toujours souhaitable au point de vue économique d'essayer de faire disparaître tout déséquilibre sur les marchés du travail. En outre, on remarque que de tels efforts peuvent avoir pour résultat final de perpétuer les déséquilibres réels qu'ils visaient à écarter, principalement dans le cas des marchés du travail où les salaires sont bas.