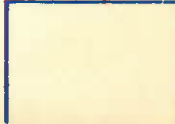
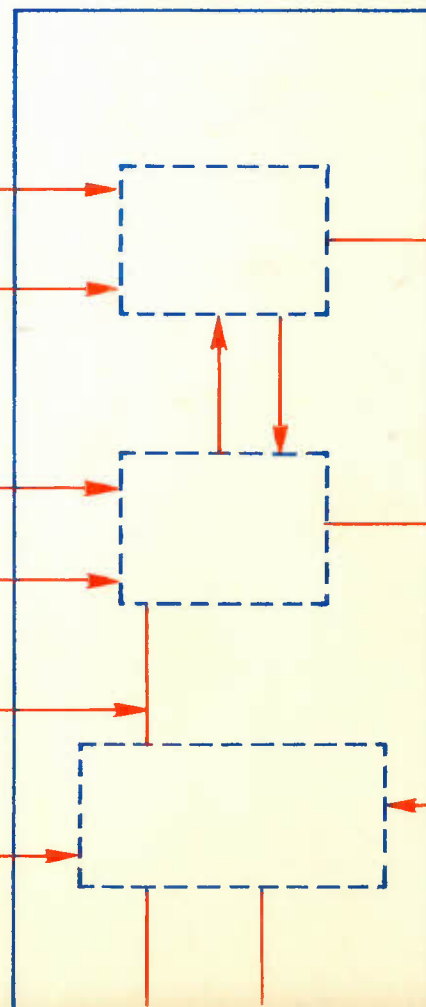
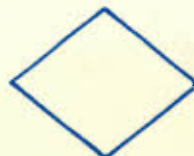
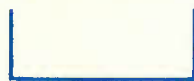
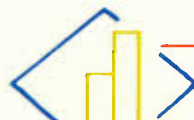
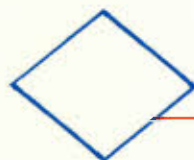
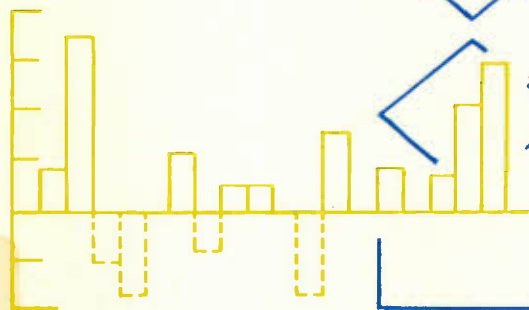


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DISCUSSION PAPER NO. 145

The Unemployment Gap in Canada,
1961-1978

by Tom Siedule
and
Keith Newton

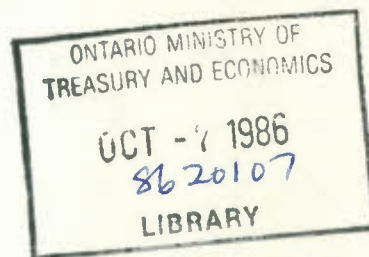
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SUMMARY

The magnitude of cyclical unemployment in Canada -- that is, the unutilized man-hours which stem from the gap between capacity output and actual output -- is estimated for the period 1961-1978. The methodology involves the calculation of the economy's real output gap, the required man-hours per unit of real output, and, from these two measures, an estimate of the idle labour resources which could have been employed if the economy had been operating at full capacity.

Our results appear to corroborate the findings of a number of labour market analysts that non-cyclical (sometimes called structural and frictional) dimensions of the official unemployment rate have become proportionately larger over time.

The estimate of cyclical unemployment is combined with estimates of labour hoarding and of hidden unemployment, respectively, to yield an overall measure of the shortfall in labour utilization attributable to the economy's failure to attain its output potential. This "unemployment gap" has increased considerably during the 1970s.

We conclude that the large magnitude of structural and frictional unemployment renders the official unemployment rate somewhat insensitive to traditional aggregate demand measures which might rather quickly trigger inflationary pressures. This problem is compounded, in our view, by the sizeable amount of labour hoarding contained in the unemployment gap measure: aggregate demand stimulus may serve only to spur fuller utilization of persons already in jobs, with little impact on measured unemployment.

Finally, it is pointed out that the sensitivity of the labour force participation decision in Canada is such that the unemployment-reducing potential of aggregate demand stimulus may be thwarted by offsetting influxes into the labour market of previously discouraged workers. In any attempts to reduce unemployment, we therefore recommend cautious application of overall fiscal or monetary stimulus and greater attention to policies which are more finely targetted to particular groups, areas, or sectors.

RÉSUMÉ

Dans la présente étude, nous avons d'abord procédé à une estimation de l'importance du chômage conjoncturel au Canada -- c'est-à-dire, du nombre d'heures-hommes inutilisées à cause de l'écart entre la production potentielle et la production réelle -- pour la période de 1961 à 1978. Il a fallu à cette fin calculer l'écart de la production réelle de l'économie, le nombre d'heures de travail requis par unité de production réelle et, avec ces mesures, déterminer la proportion de main-d'oeuvre inactive qui aurait pu être employée si l'économie avait fonctionné à pleine capacité.

Nos résultats semblent corroborer les constatations de certains analystes du marché du travail qui soutiennent que la proportion non conjoncturelle (parfois appelée structurelle et frictionnelle) du taux de chômage officiel, a pris de l'importance au fil des années.

Le nombre estimatif de chômeurs conjoncturels est ajouté à celui des travailleurs thésaurisés et au chômage caché, pour donner une mesure globale de la main-d'oeuvre non utilisée par suite de l'incapacité de l'économie à atteindre son potentiel de production. Cet écart entre le chômage officiel et le chômage réel s'est considérablement accru au cours des années 70.

Nous en venons à la conclusion que la forte proportion de chômage structurel et frictionnel rend le taux de chômage officiel moins sensible aux mesures traditionnelles de la demande globale pouvant rapidement déclencher des pressions inflationnistes. A notre avis, le problème devient encore plus complexe en raison de la thésaurisation considérable de travailleurs que comporte la mesure de l'"écart du chômage", de sorte que les stimulants

de la demande globale ne peuvent plus qu'inciter à une plus forte utilisation des personnes déjà au travail, sans réduire le chômage de façon appréciable.

Enfin, nous démontrons que la sensibilité des décisions de faire partie de la main-d'oeuvre au Canada est telle que le recours à des stimulants de la demande globale pour réduire le chômage peut être rendu inefficace par le retour sur le marché du travail de travailleurs antérieurement découragés. Nous recommandons donc que, dans toute tentative en vue de réduire le chômage, l'ensemble des stimulants budgétaires et monétaires soit appliqué avec soin, et qu'une plus grande attention soit accordée aux politiques conçues en fonction de groupes, régions, ou secteurs particuliers.

1. Introduction

In Siedule and Newton (1979a and 1979b), the concepts of labour hoarding and hidden unemployment¹ were re-examined, and empirical estimates presented. Since both of these phenomena are related to the economy's failure to attain its potential output with its given resources, a logical extension of our work is to estimate the other major component of unutilized manpower that can be attributed to the same cause.

Accordingly, the objective of the present paper is, first, to estimate that third component, which we call cyclical unemployment -- that is, the unutilized man-hours which stem from the gap between capacity output and actual output in any time period. Our second major purpose is to combine this measure with our former estimates of labour hoarding and of hidden unemployment, respectively, to obtain an overall estimate of the measure which, following Taylor (1974 and 1976), is called the unemployment gap.

Quite apart from the intrinsic academic interest in such an exercise, estimation of the unemployment gap may, we hope, serve some practical purposes, on which we will elaborate in a later section. Suffice it to say at this juncture that the exercise will permit us some insights into the interpretation of Canadian labour market phenomena and, by distinguishing the cyclical and non-cyclical components of measured unemployment, provide policy-makers with additional information inputs.

¹ In simple terms, hoarding is regarded as the practice of retaining labour over and above actual requirements. In times of cyclical downturn employers may find it cheaper to hold on to their experienced workers than to lay them off and incur the costs of screening, hiring and training workers in the upswing. Some employers may also, of course, want the flexibility of some margin of unutilized labour which can be called upon to meet unforeseen circumstances. By hidden unemployment we mean what are traditionally known as additional and discouraged workers.

2. Methodology

Two of the three components of the unemployment gap have already been estimated in Siedule and Newton (1979a and 1979b), and hence, will not be reiterated in this paper. The third component, namely cyclical unemployment, which has yet to be estimated, will be discussed here.

If, in a particular time period, an increase in aggregate demand would result in an increase in output, then the short-run capacity output has not been reached and the difference between capacity output and actual output is known as the output gap. Had aggregate demand been maintained at a sufficiently high level, then, *ceteris paribus*, the technical production possibility of the economy would have been reached, and the output gap would have been eliminated. Correspondingly, some of the unemployed man-hours could have been used to help to produce the goods and services required to eradicate the output gap.² The number of unemployed man-hours which could be put to work in closing the output gap constitutes the measure of cyclical unemployment.³ Since the concept is associated with short-run capacity output, zero unemployment is not necessarily implied by elimination of the output gap. On the contrary, labour market mismatching of various kinds, and workers' search activities, for example, will likely create some structural and frictional unemployment.

2 The basic concept is equivalent to the one used by Taylor (1976), which is derived from Tobin (1972), Klein (1960), and Okun (1962).

3 Note that this measure of cyclical unemployment is quite different from the kinds of considerations inherent in the 'natural rate' theories associated with, e.g., Friedman (1968), and Phelps (1968). The capacity view of cyclical unemployment used in the present paper is also independent of the question of whether or not manipulation of aggregate demand can actually eliminate the output gap. All that is required is the notion that cyclical fluctuations in output produce output gaps which are in turn associated with cyclical unemployment.

The question is, "How many of the idle man-hours could have been employed had the economy been operating at full capacity at all times?". The procedure is as follows: (1) calculate the real output gap, i.e. the difference between the capacity output and the real output in constant dollar terms for the period January 1961 to December 1978; (2) using the employment data and information from our work on labour hoarding, derive the required man-hours per unit of real output; (3) calculate the number of idle man-hours that could have been employed at full capacity level as the product of (1) and (2). Step (3) is a simple arithmetic operation, and needs no elaboration here. Steps (1) and (2) do, however, warrant a few words of explanation.

Statistics Canada regularly publishes real domestic product indexes on a monthly basis. By applying the Wharton School method to the real domestic product index of the total economy for January 1961 to December 1978, we have obtained the potential output estimates for the corresponding period. Careful examination of the historical observed output series reveals that only March 1966 and February 1974 can be labelled as peaks of the series. Between March 1974 and December 1978, no peak can be located. Hence, the usual practice of extrapolating the potential output line of March 1966 to February 1974 is used to yield potential output estimates for March 1974 to December 1978. Under usual circumstances, the same potential output line would have to be extrapolated backward for the potential estimates of January 1961 to February 1966. Fortunately, for the earlier period, a long time series, dating back to January 1919, is available for the industrial production index. While this index does not cover the whole economy,⁴ it is adequate for

4 It covers mines, quarries and oil wells, manufacturing, and electric power, gas, and water utilities.

the purpose of serving as an instrument from which to obtain a better estimate for potential output for January 1961 to February 1966. The procedure is as follows.

The capacity utilization rate for the industrial production index is calculated for January 1947 to December 1978, but the capacity utilization rate of the real domestic product of the total economy is calculated only for March 1966 to December 1978. The two estimated capacity utilization series are then related to each other by means of simple regression for the sample period of March 1966 to December 1978, with the utilization rate of the real domestic product as the regressand and the utilization rate of industrial production as regressor. It is found that the two series are sufficiently correlated with each other as to permit the functional relationship to be used to calculate the capacity utilization rate of the real domestic product of January 1961 to February 1966.⁵ After this step, the derivation of the full potential real domestic product is a simple arithmetic operation.

The second piece of information that is needed is the technical coefficient for labour input, i.e., the required man-hours to produce one unit of real output. Because of the practice of labour hoarding, the observed man-hours-employed/real-output ratio would not be a good estimate of this labour technical coefficient: it overstates the required ratio. Furthermore, the solution is not quite as simple as merely subtracting our earlier estimates of hoarding from the observed man-hours employed series, since hoarding is itself cyclically sensitive, having both a

5 Since the values of the regressor for January 1961 to February 1966 are available, this step is a simple arithmetic calculation.

cyclical and an autonomous component. Since the objective of the exercise is to estimate the number of man-hours which could potentially be put to work by closing the output gap, the man-hours numerator of the labour input coefficient must be expressed net of the man-hours associated with the autonomous component of labour hoarding. This latter is derived by estimating the paid labour hoarding rate under conditions of full capacity utilization.⁶

After the standardized paid labour hoarding rate is calculated, it is used to calculate the number of paid labour hoarding hours during the hypothetical 1961-78 full capacity utilization scenario.⁷ These hoarded hours are subtracted from the observed man-hours employed to yield the man-hours required to produce the observed level of historical output. The ratio of required man-hours to real output gives us the technical coefficient for labour input, i.e., the units of labour input required to produce one unit of real output. The number of idle man-hours that could have been employed under the full capacity utilization assumption is simply the product of this technical coefficient of labour and the real output gap.

6 Autonomous labour hoarding, i.e., the amount of labour hoarding at full capacity utilization, is obtained by the following estimated equation:

$$\begin{aligned} \text{PALHR} &= 35.34 - .23 \text{ TIME} - .35 \text{ RDP71RTE} \\ &\quad (1.62) \quad (2.55) \quad (-1.51) \\ \bar{R}^2 &= .50; \text{ D.W.} = 1.6 \\ \text{RHO} &= .40; 1961-77, \text{ annual} \end{aligned}$$

where PALHR, TIME, and RDP71RTE are the original paid labour hoarding rate from Siedule and Newton (1979a), time trend (equal to 1, 2, ..., for 1961, 62 etc.), and the capacity utilization rate of the total economy's real domestic product, respectively. By using the dynamic simulation technique and setting RDP71RTE equal to full capacity utilization rate for 1961 to 1978, we obtain the standardized paid labour hoarding rate for the hypothetical scenario of full capacity utilization throughout 1961 to 78. The simulation technique is identical to the one used in Siedule and Newton (1979b).

7 Unpaid labour hoarding (see Siedule and Newton, 1979a) is not included in our calculation of technical coefficient. Since the unpaid labour hoarding rate is not cyclically sensitive, its inclusion in the dependent variable would not make any material difference. It should also be noted that only annual averages for the standardized paid labour hoarding rate are available, and hence they are used as an approximation of the monthly rate in the calculation.

The procedure mentioned has implicitly used a number of assumptions, which are singled out here for clarification. First, the final step in the long chain of calculations assumes that the required man-hours to produce one unit of real output is the same for the unemployed as for the employed. Secondly, the method implicitly uses the fixed technical coefficient technology, similar to the assumptions used in a linear programming production function. This means that the method assumes that within the one month period the required man-hours to produce one unit of real output are fixed, and this labour requirement cannot be reduced by substituting more capital for labour. This seemingly stringent assumption is, in reality, not at all restrictive, because the calculation is based on monthly employment and real output data. Since the technical coefficients vary from one month to another, the rigidity of the fixed technical coefficients applies to a maximum of one month period.

3. Empirical Results and Interpretations

(i) Cyclical Unemployment

One of the major concerns of recent years has been people's belief that the official unemployment rate has become an increasingly unreliable and misleading measure of the pressure of demand in the labour market. It is contended that institutional changes and shifts in labour force composition, in particular, have transformed the characteristics of the market in such a way that the official unemployment rate tends to understate the true amount of tightness. *A priori*, it is hard to tell whether the upward drift of the official unemployment rate of recent years is due to an increasing deficiency in the demand for labour, or is due to an increase in structural and frictional unemployment. However, what we may ask on the basis of our investigations

is whether non-cyclical unemployment appears to have increased over time and how the official unemployment rate compares with a more demand-oriented indicator, the unemployment gap rate.

The questions raised above can be partially answered by examining our estimates of cyclical and non-cyclical unemployment,⁸ the unemployment gap, and the official unemployment figures. Estimates for the unemployment gap will be presented later. In this section, presentation and interpretation will be concentrated on the cyclical and non-cyclical unemployment estimates.

Table 1 and Figure 1 summarize our estimate of cyclical unemployment. In Figure 1, the ratio of non-cyclical unemployment/official unemployment depicts the relative growth of the structural and frictional dimensions of unemployment over the period 1961 to 1978. Even though the ratio shows considerable fluctuations over time, its upward trend is clearly visible. The ratios start with a value of 38 per cent in 1961 and ends with 65 per cent in 1978 which amounts to an average growth rate of 1.7 per cent per annum in Table 1. It can be seen that the amount of unemployment that is due to cyclical fluctuation of real output is proportionally more serious in the 1960s than in the 1970s. From 1961 to 1970, the average ratio of cyclical-unemployment/official-unemployment is about 48 per cent, but it is only 31 per cent for 1971-78.

8 The difference between the observed unemployment and cyclical unemployment is labelled non-cyclical unemployment in this paper, which is, in the narrow sense of the term, structural and frictional unemployment. The term non-cyclical unemployment is used in this paper, because for the "natural rate" theorists, structural and frictional unemployment is a larger set than our non-cyclical unemployment. This point will be clarified later in the text.

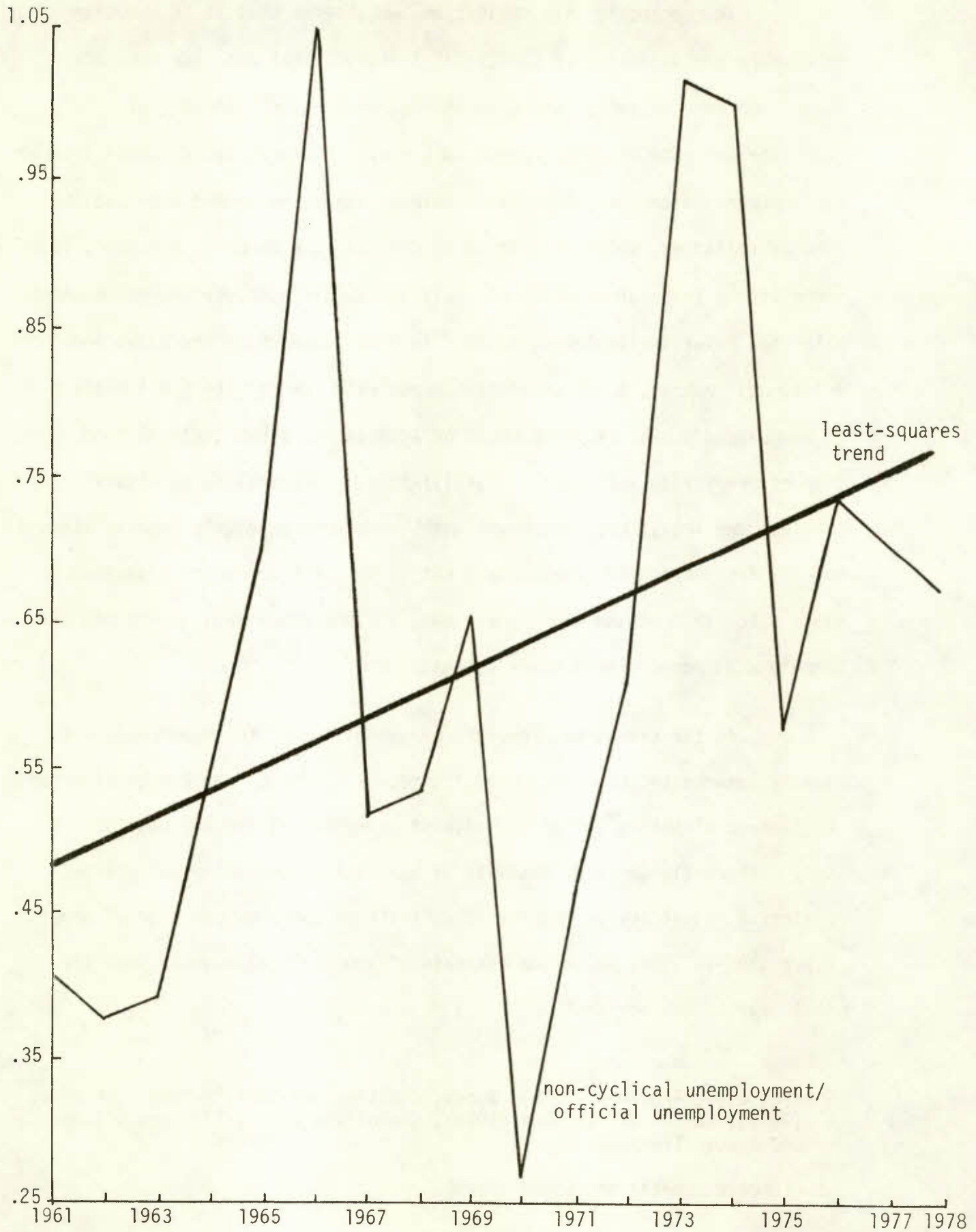
Table 1
VARIOUS UNEMPLOYMENT RATES¹

	Cyclical Unemployment Rate	Non-cyclical Unemployment Rate	Official Unemployment Rate
1961	4.4%	2.8%	7.2%
1962	3.7	2.2	5.9
1963	3.4	2.1	5.5
1964	2.3	2.4	4.7
1965	1.3	2.6	3.9
1966	0.0	3.6	3.6
1967	2.1	2.0	4.1
1968	2.4	2.4	4.8
1969	1.7	3.0	4.7
1970	4.4	1.5	5.9
1971	3.5	2.9	6.4
1972	2.6	3.7	6.3
1973	0.1	5.5	5.6
1974	0.2	5.2	5.4
1975	3.2	3.8	7.0
1976	2.1	5.1	7.2
1977	2.7	5.5	8.2
1978	3.0	5.5	8.5

1. Cyclical and non-cyclical unemployment rates are calculated according to the 98.6 per cent capacity utilization definition. See text for full explanation. 1976-78 data have been revised by the 1975 ratios of the old and new labour force surveys back to the old labour force survey basis. All other data used are from the old labour force survey. The cyclical and non-cyclical unemployment rates presented in this table are the annual averages of the monthly estimates.

Source: Based on data from Statistics Canada and estimates by the authors.

Figure 1: RATIO OF NON-CYCLICAL UNEMPLOYMENT TO OFFICIAL UNEMPLOYMENT



Source: Based on data from Statistics Canada and estimates by the authors.

In concluding this subsection, we observe that it is tempting to compare our estimates of non-cyclical unemployment with the work of those⁹ who have recently come up with figures for the 'natural' or 'equilibrium' rate of unemployment in Canada. However, our estimate is not concerned with the relationship between the unemployment rate and the rate of inflation, which is crucial to natural rate theory. Moreover, it seems likely that our estimate of cyclical unemployment may include elements which the natural rate theorist would include under the "structural and frictional" rubric, since we are concerned with the potential elimination of unemployed man-hours which would be achieved by a hypothetical condition of prevailing full capacity utilization. In practice, structural problems are inevitably interwoven with inadequate aggregate demand, since not all sectors and/or groups start out at the same degree of tightness or slack. For this reason our figures may, to some observers, understate the magnitude of non-cyclical unemployment.

At the same time, however, we cannot escape the remarkable similarity between the Economic Council's recent estimate¹⁰ of the equilibrium or 'non-accelerating inflation' rate of unemployment and our own (albeit very differently-derived) estimate of non-cyclical unemployment. The Sixteenth Annual Review reports an equilibrium unemployment rate of about 6 per cent in 1978, while our estimate of non-cyclical unemployment for that year is 5.5 per cent.

9 See, e.g., Freedman (1976), Aubry, Cloutier and Demillo (1979), Riddell (1979), Fortin and Phaneuf (1979), Grubel and Maki (1979) and Wilson and Dungan (forthcoming).

10 Economic Council of Canada (1979).

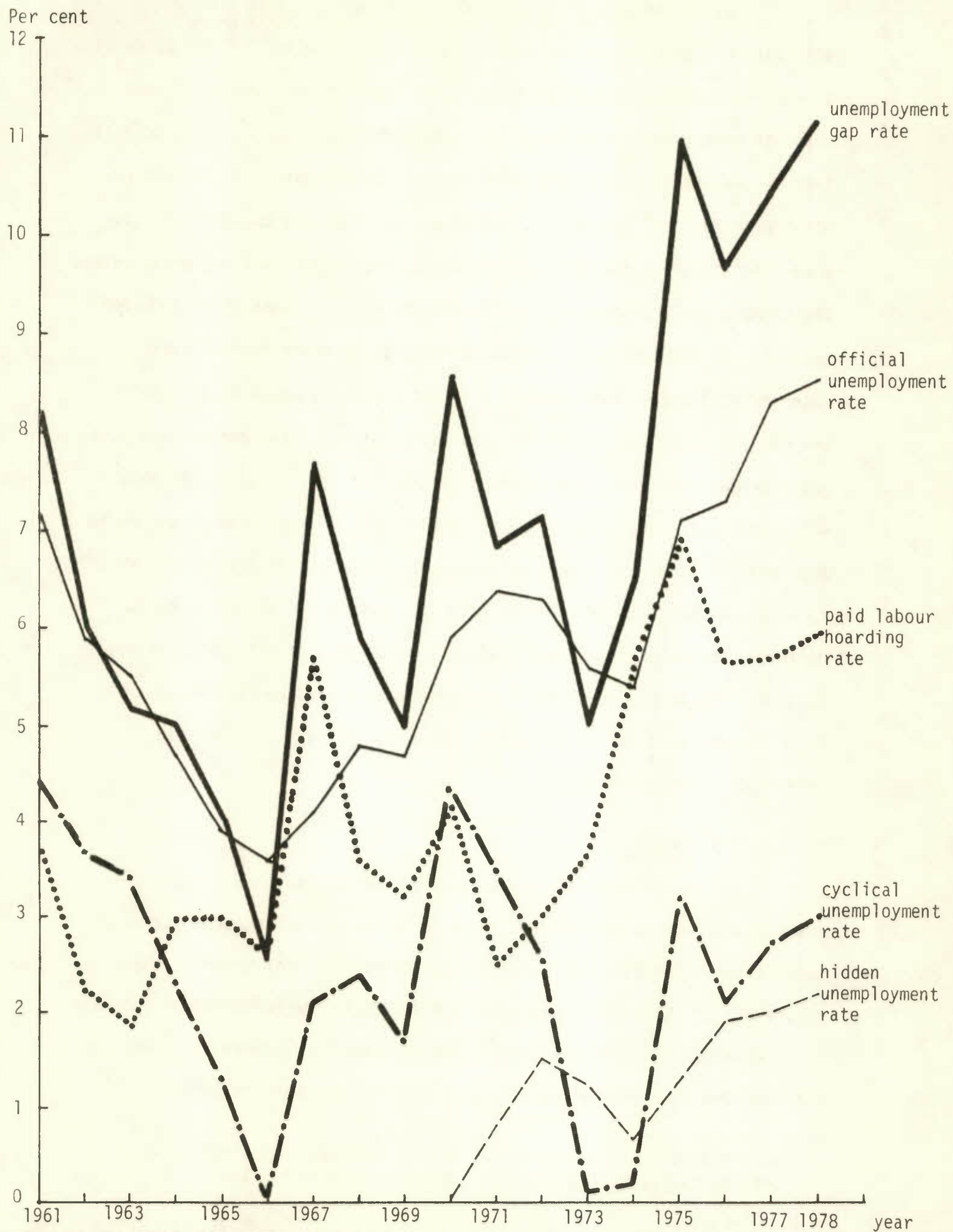
It should also be noted that the definition of full capacity utilization also has some bearing on the final estimates. In our calculations, it is assumed that full capacity utilization means 98.6 per cent capacity operation at all times. This definition of full capacity utilization is derived from observations of the historical data. It is seen that only March 1966 and February 1974 attained 100 per cent capacity utilization. Taking the annual averages of the monthly capacity utilization rates, the highest level of capacity utilization is 98.6 per cent which occurred in 1966. We conclude that a reasonably realistic definition of full capacity utilization rate is 98.6 per cent for every month of the sample period. In order to show the sensitivity of our cyclical-and-non-cyclical-unemployment estimates to various definitions of full capacity utilization, we carried out a set of calculations the results of which are presented in Appendix A. It is found that although the estimates of cyclical and non-cyclical unemployment are sensitive to the definitions used, the basic difference between the estimates appears to be that of different scaling factors. The switching of the full capacity utilization definitions, say from 98.6 per cent to 100 per cent, does not, in any meaningful way, invalidate the conclusions.

(ii) The Unemployment Gap

Figure 2 summarizes the empirical results for the unemployment gap and its components. All of these variables are expressed in terms of percentage of the observed labour supply in hours. This practice makes the components of the unemployment gap rate add up to the unemployment gap rate both numerically and graphically.¹¹ The relationship between the unemployment gap rate and the official unemployment rate is presented in Table 2.

¹¹ Note that in Siedule and Newton (1979a) the labour hoarding rate is defined as (labour hoarding in hours/hours employed) 100.

Figure 2: OFFICIAL UNEMPLOYMENT, UNEMPLOYMENT GAP AND ITS COMPONENTS



Source: Based on data from Statistics Canada and estimates by the authors.

Table 2

VARIOUS UNEMPLOYMENT INDICATORS*

	Official Unemployment Rate	Unemployment Gap Rate	Non-cyclical Unemployment Rate	Unemployment/ Unemployment Gap	Non-cyclical Unemp/Official Unemployment
1961	7.2%	8.3%	2.8%	0.87	0.38
1962	5.9	6.0	2.2	0.98	0.37
1963	5.5	5.2	2.1	1.06	0.38
1964	4.7	5.0	2.4	0.93	0.52
1965	3.9	4.1	2.6	0.95	0.67
1966	3.6	2.4	3.6	1.5	1.0
1967	4.1	7.7	2.0	0.53	0.49
1968	4.8	5.9	2.4	0.81	0.51
1969	4.7	5.0	3.0	0.95	0.64
1970	5.9	8.6	1.5	0.69	0.26
1971	6.4	6.9	2.9	0.93	0.45
1972	6.3	7.2	3.7	0.88	0.59
1973	5.6	5.0	5.5	1.11	0.98
1974	5.4	6.6	5.2	0.82	0.96
1975	7.0	11.0	3.8	0.64	0.55
1976	7.2	9.7	5.1	0.75	0.71
1977	8.2	10.4	5.5	0.79	0.67
1978	8.5	11.1	5.5	0.76	0.65

*Based on 98.6 per cent full capacity utilization definition.

Source: Based on data from Statistics Canada and estimates by the authors.

There are some noteworthy features in these results. Of the three components, the paid labour hoarding rate figures most prominently over most of the sample period, with the cyclical unemployment rate ranking second. The hidden unemployment rate is the smallest component of the unemployment gap, and is of negligible magnitude until 1971.¹² Both the paid labour hoarding rate and the hidden unemployment rate reveal noticeable upward drifts over time while the cyclical unemployment rate shows no significant trend during this period.

Table 3

CORRELATION MATRIX OF THE UNEMPLOYMENT GAP RATE, ITS
THREE COMPONENTS, AND OFFICIAL UNEMPLOYMENT RATE*

	Unemploy- ment Gap Rate	Paid Labour Hoarding Rate	Hidden Unemploy- ment Rate	Cyclical Unemploy- ment Rate	Official Unemploy- ment Rate
Unemployment gap rate	1.0				
Paid labour hoarding rate	.78	1.0			
Hidden unemployment rate	.65	.52	1.0		
Cyclical unemployment rate	.52	-0.04	-.03	1.0	
Official unemployment rate	.85	.48	.78	.52	1.0

*Based on annual data of 1961-78. Values of r greater than 0.47 are significant at the 5 per cent level.

Source: Based on data from Statistics Canada and estimates by the authors.

¹² Hidden unemployment rate for 1961-70 is less than ± 0.1 per cent. Since the magnitude is too small to be graphed, it is not shown in Figure 2 for this subperiod.

Figure 2 and the correlation coefficient matrix above reveal an unexpected feature. The correlation between the unemployment gap rate and the official unemployment rate, though far from perfect, is more than sufficient to be statistically significant at the 5 per cent level. Although the unemployment rate of recent years has been remarkably high, the unemployment gap rate has kept pace. The underlying sources of this unexpected feature are the growths of hidden unemployment and labour hoarding of recent years which have been more than sufficient to offset the significant growth of non-cyclical unemployment in the 1970s. The enigmatic feature of our findings is that they are at once both consistent with, and contradictory to, the accepted wisdom. The growing importance of that component of unemployment which is associated with structural and frictional factors is common to our results and those of many other labour market analysts. Indeed, we would reiterate that, considering the differences in methodology, our estimate of 5.5 per cent for non-cyclical unemployment in 1978 is remarkably in keeping with the Economic Council's recent estimates of an "equilibrium rate of unemployment".¹³ What is paradoxical, however, is that while structural/frictional factors appear to have increased in importance, so have some cyclical aspects of underutilization of labour. The "catch-22" is that the latter -- labour hoarding and hidden unemployment -- are not captured by the official unemployment statistics.

CONCLUDING REMARKS

The interpretation of our findings presents a vexing problem, and requires considerable care. One of our main aims has been to provide an estimate of the so-called "unemployment gap" associated with shortfalls

13 See Economic Council of Canada (1979), and the report on which this estimate is based: Wilson and Dungan (forthcoming).

from full-capacity operation of the economy. In doing so we have attempted to draw attention to some aspects of the underutilization of manpower which are not generally taken into account by the official statistics. One very significant by-product of this exercise has been the confirmation of the substantial non-cyclical component of the aggregate unemployment rate and an important corollary of this finding -- namely, that the scope for unemployment-reducing aggregate demand stimulus, without inflationary consequences, is rather limited.

In fact, our conclusions must sound a yet more cautionary note. For one thing, the existence of significant amounts of hoarding¹⁴ in the economy may mean that large proportions of any stimulative effort will serve only to absorb the slack amongst the existing employed work force without making much impression on visible unemployment. The temptation to apply additional -- and perhaps excessive -- stimulus is therefore real.

Furthermore, the cyclical sensitivity of labour force participation¹⁵ suggests that stimulatory initiatives may in some cases be confounded by labour force influxes sufficient to offset any unemployment-reducing potential. In addition, the dynamic elements affecting participation decisions make timing a crucial aspect of policy formulation.

The unemployment problem viewed from the vantage point of the unemployment gap is more complex, challenging, and difficult for policy-makers in the 1970s than in the 1960s. The appreciable increases in the rates of labour hoarding, hidden unemployment, and non-cyclical unemployment (structural and frictional) in recent years require demand management which, at least from the standpoint of labour market treatment, is more finely targetted as to sectors, regions, groups, and, importantly, timing.

¹⁴ Siedule and Newton (1979a).

¹⁵ Siedule and Newton (1979b).

Appendix A
CYCLICAL AND NON-CYCLICAL UNEMPLOYMENT
ESTIMATES BASED ON VARIOUS DEFINITIONS OF FULL CAPACITY UTILIZATION

	Cyclical Unemployment Rate			Official Unemployment Rate	Non-cyclical Unemployment Rate		
	100% Cap. Util. Def.	99% Cap. Util. Def.	98.6% Cap. Util. Def.		100% Cap. Util. Def.	99% Cap. Util. Def.	98.6% Cap. Util. Def.
1961	5.8%	4.8%	4.4%	7.2%	1.4%	2.4%	2.8%
1962	5.1	4.1	3.7	5.9	0.8	1.8	2.2
1963	4.8	3.8	3.4	5.5	0.7	1.7	2.1
1964	3.6	2.7	2.3	4.7	1.1	2.0	2.4
1965	2.6	1.7	1.3	3.9	1.3	2.2	2.6
1966	1.3	0.4	0.001	3.6	2.3	3.2	3.6
1967	3.4	2.5	2.1	4.1	0.7	1.6	2.0
1968	3.7	2.7	2.4	4.8	1.1	2.1	2.4
1969	3.1	2.1	1.7	4.7	1.6	2.6	3.0
1970	5.8	4.8	4.4	5.9	0.1	1.1	1.5
1971	4.9	3.9	3.5	6.4	1.5	2.5	2.9
1972	4.0	3.0	2.6	6.3	2.3	3.3	3.7
1973	1.4	0.5	0.1	5.6	4.2	5.1	5.5
1974	1.5	0.6	0.2	5.4	3.9	4.8	5.2
1975	4.5	3.5	3.2	7.0	2.5	3.5	3.8
1976	3.4	2.5	2.1	7.2	3.8	4.7	5.1
1977	4.0	3.1	2.7	8.2	4.2	5.1	5.5
1978	4.3	3.3	3.0	8.5	4.2	5.2	5.5

Source: Based on data from Statistics Canada and estimates by the authors.

DATA SOURCES

Statistics Canada's Real Domestic Product by Industry (Catalogue Nos. 61-005, 61-506, and 61-516) and its labour force survey have been the sources of data used in this paper. These data and their manipulation have been carefully documented in Siedule and Newton (1979a and b), and will not be reiterated here.

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