The redistribution of overtime hours

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Canada's unemployment rate has climbed steadily over the past 20 years. Stalling during periods of economic growth, it has resumed its climb during slowdowns, each time a few points ahead of the previous cycle.

At the same time, work hours have become increasingly polarized. According to the Labour Force Survey (LFS), part-time work rose by 35% between 1983 and 1995, compared with 19% for full-time work. The increase in involuntary part-time work, which reflects growing underemployment, practically doubled. The Survey of Work Arrangements (SWA) of November 1995 reveals that 28% of workers would have preferred more hours. Furthermore, according to the same source, 1.5 million Canadians regularly worked paid overtime.

A shortage of jobs and the polarization of work hours represent considerable economic and social costs. Thus, whether for the sake of equity or simply to reduce the costs associated with unemployment, some economists consider the redistribution of work hours among a growing number of available workers to be a partial solution to the unemployment problem.

With data from the 1995 SWA, this article considers how regular paid hours of overtime (see *About the data*) could be converted into full-time jobs (or full-time equivalents, FTE). These hypothetical jobs (created at a ratio of one hour freed to one hour created) are then distributed by province, occupation, and level of education. Finally, the study attempts to match these jobs with the number of unemployed by province and occupation; it shows that the potential for job creation remains hypothetical, particularly if extra hours are given up voluntarily.[2]

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Measures for reducing work hours

A number of measures for reducing work hours can be considered. These range from cutting the number of hours worked daily, weekly, or even yearly (by increasing the number of vacation weeks, for example), to eliminating or decreasing overtime and long hours, lowering the retirement age, raising the mandatory number of years of schooling, and lengthening education leave. The more widespread use of part-time work, compensatory time off in the case of long hours (in lieu of salary compensation), and job sharing are among the possibilities.

Government regulations and individual or collective agreements are sometimes used to apply these measures, or an effort is made to have workers voluntarily reduce their work hours. Unlike some European

About the data

This article is based on data from the Survey of Work Arrangements (SWA)[1] conducted in November 1995. Sponsored by Human Resources Development Canada, the SWA was carried out by Statistics Canada as a supplement to the Labour Force Survey (LFS). In addition to the usual LFS variables, the SWA includes information on work hours (usual and actual, paid or unpaid, and paid or unpaid overtime), work schedules (regular day, night, shift work and so on), and working conditions (such as flexible time, working at home, job sharing, and non-salary benefits). It also includes a section on self-employment. Moreover, the SWA collects information on unpaid overtime. These hours have not been considered in this study, however, since they could hardly be converted to new paid jobs.

Only the **usual paid overtime** worked by all paid workers is considered. These hours reflect the situation in November 1995. If the study had been carried out at another time, the results could have been slightly different. The total includes only overtime worked in the main job. Extra hours worked in secondary jobs by moonlighters are therefore not considered.

Overtime hours have not been adjusted to take into account seasons or statutory holidays. With usual overtime hours, however, it is possible to avoid some of the seasonal aspect of overtime.

Job-creation potential is calculated in **full-time equivalents (FTE)**. A total of 6.8 million hours of overtime were usually performed in a typical week in 1995. These hours have been divided by the average weekly working hours of full-time paid employees, namely, 40.5 hours for the November 1995 SWA. This results in a potential of 169,000 FTEs. Averages other than the 40.5 hours could have been used and would have resulted in different potentials. For example, had the minimum number of weekly hours for full-time employment been used (30 hours), the result would have been 228,000 jobs. Had the distribution of full- and part-time jobs (in November 1995) been considered, that is, 81% and 19%, respectively, as well as the average number of weekly work hours pertaining to these two types of employment (40.5 hours and 16.6 hours, respectively), the result would have been 215,000 potential jobs. The concept of FTEs has the advantage of being simple. That said, the number of FTEs obtained (169,000) is not fixed since, for example, some could be divided among two or more part-time employees, which, all things being equal, would raise the number of new employees.

countries, the North American tradition does not seem to favour job sharing or the reduction of hours. Certain examples tend, moreover, to show that these measures are not very successful in Canada when applied on a voluntary basis (Huberman and Lacroix, 1996; Drolet and Morissette, 1997).

This article assesses only the *potential* for job creation through the conversion of paid overtime. The amount of the latter varies over an economic cycle. During a period of recovery, the growth in demand for goods exerts upward pressure on production and employment. Before new workers are hired, production is boosted through recourse to overtime. Usually, only when the growth in demand seems to have held are new workers hired. When activity slows down, overtime is decreased before lay-offs are begun, as needed. Overtime also varies according to industry and time of year; in construction it is more frequent in the summer; in the retail industry, it increases during the holiday season. However, a recent study tends to show that exporting industries are increasingly resorting to just-in-time production (Billings, 1996), which leads them to rely more heavily on overtime to meet demand for their products.

Computing the job-creation potential

Interest in the notion of cutting work hours to counter unemployment depends on the economic situation. In periods of strong growth, a *laissez-faire* approach is usually adopted and the laws of the market determine the number of unemployed. Reducing work hours tends to win over followers when, as is the case now, unemployment fails to decline in spite of economic recovery and more modest growth in the labour force. In Canada, as in many other countries, especially in Europe, several possibilities have been studied in this respect.[3]

But what is the potential for job creation through the conversion of paid overtime? According to the SWA, 1.5 million workers, that is, 14% of all paid workers, reported regularly working an average 5.6 hours of paid overtime weekly, for a total of 6.8 million hours. Assuming that this overtime could be converted into full-time equivalents (FTE) or jobs of 40.5 hours a week (the average number of weekly hours reported by full-time workers in November 1995), these 6.8 million hours of overtime could give rise to 169,000 FTEs (see *About the data*).

Assumptions

The creation of these 169,000 jobs rests on several assumptions. For instance, the exercise assumes that both employers and employees would be in favour of eliminating overtime. It assumes also that all employers would agree to hire new workers and to maintain the number of hours worked overall. The decrease in overtime would lead to a proportional reduction in the earnings of the employees concerned. As well, the savings realized from not having to pay overtime would cover the exact costs of hiring and training, as well as the new workers' lack of experience. No discrepancy would exist between the qualifications needed for these jobs and those of the unemployed, so average labour productivity would remain unaffected and labour costs unchanged.

The job creation scheme also assumes that new workers would have the same marginal propensity to consume goods and services as those working overtime; that the drop in demand by overtimers would be entirely compensated by a rise in demand by new workers, with the result unchanged overall.

As well, this notion assumes that production would not be affected by the elimination of paid overtime, leaving prices, as well as the level of exports, unchanged.

In terms of jobs, it is assumed that the labour force would be fully mobile, so that a job announced in one province could be filled by any Canadian from another province. Furthermore, the announcement of new jobs would have no effect on labour supply and demand, which could modify salary levels.

Distribution by occupation and province

If all these assumptions held, most of the 169,000 potential jobs would be created in Ontario and Quebec, owing to the size of their working populations (Table 1). However, it should be noted that overtime could be temporary in some sectors. This is the case, for example, with the construction of the Confederation Bridge linking Prince Edward Island to the mainland, as well as with the building of the Hibernia oil platform located off the coast of Newfoundland. The job-creation potential in occupations called upon for such projects (as well as in certain professional occupations in Newfoundland and Prince Edward Island) could disappear now that the bridge and platform have been completed. Overtime, and therefore the level of FTEs, reflects activity during the reference period (November 1995). This cautionary note applies to all occupations and all provinces.

In all regions, occupations related to processing, machining and product fabricating would be responsible for creating the greatest proportion of jobs (31%). Their potential is highest in Ontario, where 43% of new jobs would fall into this category, owing mainly to overtime in the manufacturing of transportation equipment, agricultural machinery, metal products and electrical products.

Managerial and administrative jobs and professional positions present considerable job-creation potential. They represent between 33% (in Quebec) and 18% (in the Atlantic region and Ontario) of the potential in the regions studied. Occupations in construction could give rise to a number of jobs, notably in British Columbia and in the Prairie and Atlantic provinces.

Table 1
Redistribution of full-time equivalents (FTEs), by occupation and province

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
						'000					
All occupations	**169**	**1**	**1**	**4**	**3**	**40**	**76**	**5**	**4**	**20**	**16**
						%					
Managerial/administrative	9	6	2	4	5	13	7	6	2	11	16
Professional	13	12	28	10	14	20	11	13	7	11	11
Clerical	9	9	6	8	6	8	9	10	7	11	8
Sales	3	3	-	1	3	4	3	5	1	5	2
Service	7	10	6	16	6	8	6	7	9	7	8
Primary	4	-	9	7	4	4	1	6	16	12	6
Processing, machining and product fabricating	31	26	14	22	30	22	43	24	30	16	18
Construction	10	14	23	9	10	9	9	12	19	13	15
Transport equipment/ Material handling	14	20	14	24	24	12	13	17	9	14	16

Source: Survey of Work Arrangements, November 1995

Potential by level of education and province

In general, jobs created by converting overtime require a fairly high level of education (Table 2). Assuming that workers who would be filling these new jobs need the same level of education as those who currently fill these jobs, 47% of the new jobs would require at least a postsecondary diploma. In some provinces, such as the Atlantic region, the level is even higher: 58% of jobs thus created would require at least a postsecondary diploma. In the Prairie provinces, this proportion is much lower (38%). Some current workers may, however, be overqualified, which could inflate the required level of education.

When both occupation and level of education are considered, many new jobs would call for a well-qualified, often highly educated labour force. Depending on the region, managerial/administrative and professional positions represent nearly a quarter of the overall potential, and those in construction, a tenth. Many other new jobs would be in processing, machining and product fabricating. These too may require fairly specialized workers. So if a strict match by occupation were attempted, the discrepancy between the characteristics of the unemployed and those of the FTEs could well be considerable.

Potential for unemployment reduction

Ideally, if there were no obstacles to the conversion of overtime hours, the 169,000 new jobs would reduce the number of unemployed (1.3 million in November 1995) by 13.2% and the unemployment rate from 8.7% to 7.5% (Table 3). (This presupposes, however, that the announcement of new jobs would not persuade new workers to enter the labour force.)

The effect on unemployment is greater in some provinces because the number of FTEs varies across the country, as does the extent of unemployment. Thus, in Newfoundland, the relative weight of the new jobs is slight compared with the number of unemployed, who constituted 16.3% of the labour force in November 1995. The conversion of overtime into new jobs might, therefore, decrease the number of unemployed by only 3.4%. The effect is more significant in Ontario (17.9%) and Alberta (16.8%), since unemployment is lower (unemployed workers represented, respectively, 7.4% and 7.9% of the labour force of these provinces) and the proportion of potential jobs greater; these jobs represented less than 2% of all paid jobs in Ontario and Alberta, but less than 1% in Newfoundland.

Matching with unemployed workers

The creation of 169,000 FTEs relies on a number of assumptions. Among other things, a perfect match between the qualifications of the unemployed and those required by the new FTEs would be necessary, as would full mobility of the unemployed between provinces. These two requirements have been set aside in the exercise that follows.

The study took into account occupation and province in its match of new FTEs and the unemployed. This means that both the skills required for the new positions and those offered by the unemployed were considered. So too were the unemployed workers' province of residence and the location of the jobs. Matching by occupation was carried

Table 2
Redistribution of full-time equivalents by level of education and province

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
						'000					
All levels	**169**	**1**	**1**	**4**	**3**	**40**	**76**	**5**	**4**	**20**	**16**
						%					
Grades 0 to 8	6	8	5	7	6	9	5	5	3	5	2
Some secondary	15	9	20	11	13	11	15	14	20	21	13
High school graduation	22	5	7	9	34	19	23	26	39	24	22
Some postsecondary	10	-	9	8	3	8	10	7	9	12	18
Postsecondary certificate or diploma	37	79	40	51	35	41	38	38	22	28	33
University degree	10	-	18	15	9	12	8	10	7	10	13

Source: Survey of Work Arrangements, November 1995

out at three levels of detail: major group (corresponding to the 1980 Standard Occupational Classification's two-digit code), minor group (three-digit code), and unit group (four-digit code).

This matching is quite artificial for a number of reasons. First, the occupation of unemployed workers in the SWA corresponds to that of their last job, which is not necessarily the one in which they are trained. In addition, a third of the unemployed workers were without a job for more than a year, thus, no occupation was assigned to them. To fill this gap, these workers were divided so as to reflect the distribution of unemployed workers with an occupation.[4] Also, while certain occupations require fairly specific qualifications, others require very few. Hence, matching by occupation, regardless of the level of breakdown (major, minor, or unit), does not entirely reflect reality. In some cases, the major group classification will be too broad, since this level of detail might pair an engineer with the work of an architect. On the other hand, the unit group classification would be too restrictive for occupations that require few qualifications, since it would exclude a receptionist from taking on clerical work. The calculations in this article thus constitute minimum and maximum limits of discrepancies between occupations of the new jobs and the unemployed. The study assumed that all tasks related to the new jobs were easily interchangeable between the sexes.

Matching was first done for Canada as a whole, assuming free movement of workers between the

Table 3
Potential for reducing the number of unemployed before matching by province

	Number of unemployed	FTE *	% drop in the number of unemployed	Unemployment rate	
				Before FTE	After FTE
	'000			%	
Canada	**1,284**	**169**	**13.2**	**8.7**	**7.5**
Newfoundland	37	1	3.4	16.3	15.7
Prince Edward Island	7	1	7.6	10.8	9.9
Nova Scotia	45	4	7.8	10.5	9.6
New Brunswick	30	3	11.6	8.7	7.7
Quebec	375	40	10.7	10.5	9.4
Ontario	423	76	17.9	7.4	6.1
Manitoba	47	5	9.8	8.6	7.7
Saskatchewan	33	4	13.1	6.7	5.8
Alberta	118	20	16.8	7.9	6.6
British Columbia	169	16	9.4	8.8	8.0

Source: Survey of Work Arrangements, November 1995
* *Full-time equivalents.*

provinces; the inverse assumption, that is, the absence of interprovincial mobility, was then examined.

Result of matching

Once the unemployed and new jobs were matched by occupation – by major, minor and unit groups – the number of FTEs for Canada as a whole (169,000) shifted to 167,000, then to 165,000 and 136,000 (Table 4). The number of unemployed workers in November 1995 was 1.3 million; the maximum reduction in the number of unemployed workers (169,000) would therefore have been 13.2% (and around 10.6% for the narrowest occupational classification). These exercises assumed free movement of workers between provinces, meaning that a job created in British Columbia could be filled by an unemployed worker formerly from Newfoundland, for example.

With no interprovincial mobility, the number of FTEs was lower for all levels of matching by occupation, dropping from 155,000 to 93,000. The number of unemployed workers thus dropped by 12.1% when the match was made by major group, and by 7.2%, by unit group.

This study proceeded under the assumption that employees would be willing to eliminate overtime with a proportional decrease in salary and non-salary benefits. According to the SWA, however, only 5% of employees who regularly work overtime would agree to have their hours reduced. In fact, 28% preferred to work more hours. If only consenting workers had their work hours reduced by the equivalent of their overtime hours, only a little under 10,000 jobs would be created. The reduction in the number of unemployed would therefore correspond to only a fraction of a percentage and would barely change the unemployment rate (Table 5).

All of these hypothetical scenarios show how easily a potential 169,000 FTEs can be shrunk by several thousand. For example, one could consider another scenario in which employers support the elimination of overtime hours. Yet some might resist the introduction of such a measure because of the costs related to hiring and training, and the fixed costs associated with each new employee (contributions to employment insurance plans, to the Canada and Quebec Pension Plan, and to private employee plans, as applicable). The increase in labour costs could lead to a decline in production, and therefore in employment. It could also bring about higher prices, which might depress overall demand and undermine the ability of Canadian firms to compete internationally.[5] Such a situation could lead to a deterioration in the balance of trade. Ironically, in that context the reduction in work hours could have the opposite effect from that sought; that is, it could increase the number of unemployed.

It cannot be expected that each hour freed will automatically be assigned to a new worker. Numerous studies conducted in the United States, Germany, Great Britain, France, and the Netherlands have assessed the effects on employment

Table 4
Number of FTEs * before and after matching by occupation (two-, three- and four-digit codes)

	Before matching	After matching					
		Interprovincial mobility			No interprovincial mobility		
		Major **	Minor	Unit	Major	Minor	Unit
				'000			
All occupations	**169**	**167**	**165**	**136**	**155**	**148**	**93**
Managerial and administrative	16	16	16	15	16	16	11
Professional	22	20	19	17	18	16	10
Clerical	15	15	15	13	14	14	9
Sales	5	5	5	5	5	5	4
Service	12	12	12	11	12	12	9
Primary	7	7	7	5	6	6	5
Processing, machining and product fabricating	52	52	51	34	46	43	24
Construction	17	17	17	16	17	17	9
Transport equipment/Material handling	23	23	22	19	21	20	13
				%			
% drop in the number of unemployed	13.2	13.0	12.9	10.6	12.1	11.6	7.2
Unemployment rate (8.7%)	7.5	7.5	7.6	7.8	7.6	7.7	8.0

Source: Survey of Work Arrangements, November 1995
* *Full-time equivalents.*
** *Major, minor and unit headings refer to the two-, three- and four-digit occupational codes (1980 SOC).*

Table 5
Number of FTEs * before and after matching by occupation (two-, three- and four-digit codes) when overtime ** is reduced voluntarily

	Before matching	After matching					
		Interprovincial mobility			No interprovincial mobility		
		Major †	Minor	Unit	Major	Minor	Unit
				'000			
All occupations	**9.7**	**9.7**	**9.7**	**8.0**	**9.4**	**8.9**	**5.6**
Managerial and administrative	1.3	1.3	1.3	1.3	1.2	1.2	0.8
Professional	1.7	1.7	1.7	1.6	1.7	1.5	1.0
Clerical	0.6	0.6	0.6	0.4	0.5	0.5	0.3
Sales	0.4	0.4	0.4	0.4	0.3	0.3	0.2
Service	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Primary	0.2	0.2	0.2	0.2	0.2	0.2	--
Processing, machining and product fabricating	3.5	3.5	3.5	2.3	3.5	3.3	1.7
Construction	0.6	0.6	0.6	0.6	0.6	0.6	0.4
Transport equipment/Material handling	1.2	1.2	1.2	1.2	1.2	1.0	0.9
				%			
% drop in the number of unemployed	0.8	0.8	0.8	0.6	0.7	0.7	0.4
Unemployment rate (8.7%)	8.7	8.7	8.7	8.7	8.7	8.7	8.7

Source: Survey of Work Arrangements, November 1995
* *Full-time equivalents.*
** *This table assumes that workers who are willing to reduce their work time will do so by giving up overtime hours.*
† *Major, minor and unit headings refer to the two-, three- and four-digit occupational codes (1980 SOC).*

of past reductions in work hours. The studies have shown that these effects are minimal and usually well offset by increases in productivity (White, 1987).

Even if there are relatively few examples in Canada, work sharing is likely to be more successful in limiting the effects, at the firm level, of cyclical and temporary variations in production. It would preserve jobs rather than create new ones because work is shared by current employees with the required education and experience. They also live in the same region as the jobs. The scheme is attractive to employers because it means they do not need to lay off qualified and experienced workers in whom they have invested. They can also realize savings when activity resumes, notably with respect to rehiring costs. This corresponds to the work sharing program instituted in 1977 under the Unemployment Insurance program (Singh, 1991).

Conclusion

This article has examined the potential of creating full-time equivalent jobs through the conversion of regular overtime. As the results are based on the Survey of Work Arrangements of November 1995, they reflect overtime reported for that period. Hypothetically, the 6.8 million hours of overtime worked each week could have been used to create 169,000 full-time jobs. The reduction in the number of unemployed workers would consequently have been 13.2%. In other words, the unemployment rate for November 1995 would have dropped from 8.7% to 7.5%.

An examination of the characteristics of these hypothetical jobs reveals, however, that they would require relatively high qualifications. Discrepancies between the characteristics of the unemployed and those of the hypothetical jobs would reduce the potential by several thousand jobs. Therefore, a match was made based solely on occupation (according to the three-tiered classification system) and province. In the most restrictive case, potential jobs created would be no more than 93,000, owing to their mismatch with the occupations and provinces of the unemployed. The unemployment rate would shift from 8.7% to just 8.0% instead of the 7.5% suggested by the most optimistic scenario. Finally, if overtime were reduced only for workers who were in favour of such a measure, fewer than 10,000 full-time jobs would be created. The reduction in the number of unemployed workers would, as a consequence, be only a fraction of a percentage, and the effect on the unemployment rate would go unnoticed. Aside from the artificial nature of this match, the creation of 169,000 jobs would be difficult to achieve because of the multiple effects of this measure. □

Notes

1 Statistics Canada is currently putting together a publication of findings from the SWA (titled *Work Arrangements in the 1990s*), to be published in 1998.

2 For a detailed profile of persons who work both paid and unpaid overtime, see Duchesne (1997).

3 For example, the Ontario government created an advisory group on work time in 1987; in 1994, the federal government did so as well (HRDC, 1994); finally, the Quebec government considered the topic during its most recent economic summit in 1996.

4 In so doing, it is possible, however, to underestimate the proportion of unemployed workers who are poorly qualified, as they are usually more concentrated among those with no stated occupation.

5 The effect on Canadian competitiveness internationally could be that much greater, as recent growth in overtime is sometimes attributed to sectors most exposed to international competition (Billings, 1996). These sectors rely heavily on overtime because of their extensive use of just-in-time production. The rise in labour costs in these more vulnerable sectors could, therefore, compromise Canadian competitiveness.

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