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Perspectives on Labour and Income

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Symbols

The following standard symbols are used in Statistics Canada publications:

.	not available for any reference period
.	not available for a specific reference period
...	not applicable
p	preliminary
r	revised
x	confidential
E	use with caution
F	too unreliable to be published

Highlights

In this issue

Families on the financial edge

- The proportion of individuals in families with low income and little financial wealth remained virtually unchanged between the mid-1980s and the late 1990s.
- However, some groups, such as recent immigrants, became more financially vulnerable to income interruptions and unexpected expenses. Others—specifically, elderly unattached individuals—improved their economic position.
- In 1999, the vast majority of low-income families had no more savings to protect themselves against adverse events than did their counterparts in the mid-1980s.
- In 1999, the most vulnerable families by far were prime-aged (25 to 54) families of two or more persons with no earner. Only one-third of persons in these families had a major income recipient with a long-term work limitation or disability. Of the remaining prime-aged families with no earner, almost two-thirds had a major income recipient with at most a high school diploma or some postsecondary education.

Falling behind

- One in 6 Canadian families fell behind two months or more in a bill, loan, rent or mortgage payment in 1998. Couples without children had the lowest incidence (10%), female lone-parent families had the highest (32%). However, most of the differences between family types were eliminated when the characteristics of the families were controlled for. The one exception was female lone-parent families who were 1.3 times more likely than couples with children to have fallen behind.

- Larger families (three or more children) differed significantly from families with two children, even after key characteristics such as income and age were controlled for. The absence of children was associated with a lower probability of falling behind.
- Age and education of the major income recipient (MIR) remained important after other characteristics such as family type, income and net worth were controlled. Older families and older unattached individuals were less likely to have difficulty making timely payments. Families in which the MIR had a university degree had a 40% lower probability of falling behind than those in which the highest level was high-school graduation.
- When families were placed in quintiles based on net worth, those in the bottom quintile (negative or low net worth) showed a 6 times higher incidence of falling behind than those at the top of the distribution. Surprisingly, 5% of families in the top of the distribution also fell behind. The median family income of those who made their payments on time was almost 50% higher than the income of those who did not. However, after other family characteristics were controlled for, after-tax income and net worth were associated with only small differences in the probability of falling behind.
- For most family types, the rate of falling behind for those who had previously declared bankruptcy was roughly twice as high as for those who had not (30% compared with 15%). This was not the case for female lone-parent families, where the rate was high even for those who had never declared bankruptcy (40% compared with 31%). After other characteristics were controlled for, families with a previous bankruptcy were 1.6 times more likely to have trouble keeping up with their payments. Unattached individuals who had declared bankruptcy were twice as likely to have fallen behind.

■ Better jobs in the new economy?

- While employees in knowledge-based workplaces generally work longer hours, they also receive higher wages. On average, hourly wages in knowledge-based industries were 32% higher than in other industries. However, after differences in education, size and location of workplace, occupation, and hours are controlled for, the gap drops to 8%.
- Compared with other workers, employees in knowledge-based workplaces are not necessarily better covered by a registered pension plan. However, they often receive employee stock options and are more frequently involved in group registered retirement savings plans.
- Knowledge-based workplaces offer fitness and recreation services and employee assistance programs (such as counselling, substance abuse control, financial assistance, legal aid) more frequently than other workplaces, and child care services at least as often.
- Employees in knowledge-based workplaces are more likely to have performance appraisals. Furthermore, the results are more likely to affect their pay or benefits.
- Workers in service-producing, knowledge-based workplaces are less likely to be unionized than other workers (except those in retail trade and consumer services). As a result, few have a formal grievance system.

Perspectives

Families on the financial edge

René Morissette

OVER THE LAST 15 YEARS, several studies have examined the extent of low income among Canadian families (Picot and Myles 1995; Myles and Picot 2000; Morissette and Zhang 2001). A family's after-tax income is an important indicator of its ability to sustain a given standard of living. Also important is its wealth, which includes resources that can be converted into cash in times of need. Financial assets can allow a family to absorb the shock of economic stresses, such as job loss, sickness or divorce (Wolff 1998). However, because of the scarcity of wealth data, very few studies have examined the extent to which Canadian families rely on both income and wealth to maintain a desired level of consumption (Love and Oja 1977; Wolfson 1979).¹

Using the 1984 Assets and Debts Survey and the 1999 Survey of Financial Security, this article examines which families are financially vulnerable in the face of income interruptions or unexpected expenses. Families with both low income and little or no financial wealth have fewer resources, making them more vulnerable than other families to negative shocks. Since some families with no financial wealth or net worth may earn substantial incomes, making them *not* vulnerable, the article looks at two types of families that are potentially at risk: low-income families with no financial wealth, and low-income families with modest financial wealth. This examination helps identify families likely to face short-term financial difficulties as a result of unexpected events (see *Data sources and definitions*).

Families with no financial wealth or net worth

Between 1984 and 1999, the percentage of persons living in families with no net worth rose slightly, from 8% to 11% (Tables 1 and 2). This increase occurred despite an increase in the median and average wealth of families (Morissette, Zhang and Drolet 2002). The

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percentage of persons living in families with no financial wealth followed a similar pattern, increasing from 17% in 1984 to 19% in 1999.

The small increase masks substantial increases for some family types. Among individuals living in very young families of two or more persons (families in which the major income recipient was less than 25), the incidence increased from 24% to 40%. Similarly, those in female lone-parent families, immigrant families living in Canada for less than 10 years, and families in Newfoundland and Labrador saw increases of at least 7 percentage points.⁴

In addition to those living in very young families and female lone-parent families, those in prime-aged families⁵ with no earner were the most likely to be in a family with no financial wealth in 1999—at least 40%. Other individuals with a fairly high risk included non-elderly unattached individuals (30%), those living in Newfoundland and Labrador (33%), those in families whose major income recipient had a work limitation (31%) or was aged 25 to 34 with no university degree (33%), and couples with children whose major income recipient was aged 25 to 34 (28%).

In contrast, individuals in elderly families (major income recipient 65 or over) were the least likely to be in a family with no financial wealth. This is not surprising since older families have had more time than their younger counterparts to accumulate savings.

Some families with no financial wealth are not financially vulnerable

Some families with no financial wealth may earn substantial income and are therefore not necessarily financially vulnerable. For example, many young families with children have had little time to accumulate savings. This is especially true now that young people are staying in school longer and entering the full-time labour market later. Some families earning substantial income may choose to spend a large portion of it, thereby accumulating little or no financial

Table 1: Persons in families with no net worth or financial wealth, by selected demographic characteristics

	No net worth*		No financial wealth*	
	1984	1999	1984	1999
	%			
All family units	8.3	11.0	17.2	19.0
Age of major income recipient (MIR)				
Less than 25	21.5	37.9	26.7	43.1
Two or more persons	17.5	32.3	23.9	40.0
25 to 34	12.7	20.9	23.8	30.1
Couples with children under 18	9.3	16.2	23.8	28.0
35 to 44	6.8	10.0	18.1	18.6
Couples with children under 18	5.0	7.0	16.5	16.0
45 to 54	4.0	5.7	11.8	15.7
Couples with children under 18	2.7	3.4	12.0	13.2
55 to 64	3.6	4.6	10.5	10.3
65 and over	4.6	3.7	7.9	7.3
Education level of MIR				
No university degree	9.0	12.3	17.9	20.8
25 to 34	13.6	22.8	24.9	32.6
35 to 54	6.3	9.5	16.5	19.6
University degree	4.5	6.6	12.8	12.9
25 to 34	7.8	15.0	17.8	22.6
35 to 54	2.6	4.2	11.1	10.8
Family type				
Elderly unattached individuals	8.0	6.2	10.9	8.6
Other unattached individuals	23.9	26.6	27.6	30.1
Couples, no children	7.0	8.9	13.5	14.4
Couples, children under 18	6.3	8.8	18.3	18.6
Couples, children 18 and over	1.6	4.7	8.6	17.0
Elderly couples, no children	1.3	1.9	3.3	4.1
Lone-parent families	26.8	30.8	34.4	40.2
Female lone-parent	28.6	32.7	35.4	42.8
Other families	10.0	9.7	16.9	17.9
Immigration status of MIR				
Canadian-born	8.8	11.3	18.0	19.5
Immigrants	6.5	10.1	14.0	17.6
Less than 10 years	10.1	17.5	15.2	26.3
10 years or more	5.7	7.3	13.7	14.3
Families of two or more and MIR aged 25 to 54				
No earners	37.1	40.5	44.2	43.5
One earner	9.4	15.1	20.6	25.2
Two or more earners	4.9	7.2	15.8	17.3
MIR with long-term work limitation				
No	..	10.4	..	19.5
Yes	..	20.8	..	31.3

Sources: Assets and Debts Survey, 1984; Survey of Financial Security, 1999

* Zero or negative.

assets for a significant period. Some families may have had to sell all their financial assets to substitute for income lost during a permanent layoff in the past, or to pay for unexpected expenses such as major house repairs. Or, some families may have opted to put their savings into their home.⁶

In both 1984 and 1999, slightly more than 70% of individuals living in families with no financial wealth were not in low income. The remaining 30% belonged to families whose after-tax income was below Statistics Canada's low-income cutoffs (Chart A).⁷

Depending on the type of family, individuals in families with no financial wealth had markedly different chances of living in low income. In 1999, the chances were greatest for non-elderly unattached individuals (56%), and for those living in female lone-parent families (63%), very young families (53%), and recent-immigrant families (49%). The chances of being in low income were fairly low for non-elderly couples, with or without children.

In 1984, having no financial wealth was a fairly sure sign that an elderly unattached individual would be in low income. Indeed, 76% of elderly unattached individuals with no financial wealth were in this position. This pattern held true to a much lesser extent in 1999 when the incidence dropped to 39%.⁸

Low-income families with no financial wealth

Low-income families with no financial wealth are likely to be much more financially vulnerable to adverse events than other fami-

Table 2: Persons in families with no net worth or financial wealth, by province and selected city

	No net worth*		No financial wealth*	
	1984	1999	1984	1999
	%			
Province				
Newfoundland and Labrador	6.0	14.8	24.8	33.4
Prince Edward Island	7.7	12.0	21.2	23.8
Nova Scotia	9.1	13.5	24.9	24.2
New Brunswick	11.1	11.7	25.9	27.2
Quebec	9.8	11.9	17.8	19.2
Ontario	7.7	10.4	16.0	18.0
Manitoba	7.6	10.3	16.0	16.4
Saskatchewan	7.4	8.9	19.3	16.6
Alberta	8.7	9.8	14.9	16.7
British Columbia	7.0	11.5	15.5	19.5
Selected cities				
Montréal	12.6	14.3	18.3	21.6
Toronto	7.8	10.4	13.7	17.4
Vancouver	7.5	10.8	13.9	19.0

Sources: *Assets and Debts Survey, 1984*; *Survey of Financial Security, 1999*

* Zero or negative.

lies since not only do they live in straitened circumstances but they also have no financial assets to draw on.

In both 1983 and 1998, about 14% of the Canadian population was living in low income (Tables 3 and 4).⁹ Of all individuals in low income, 36% to 39% lived in families with no financial wealth in the following year (Chart B).¹⁰ Consequently, 5% of the population lived in families having low income and no financial wealth during both the 1983-84 and the 1998-1999 periods (from here on referred to as 1984 and 1999 respectively).

This constant share hides important changes that occurred in some family types. The proportion of elderly unattached individuals having low income and no financial wealth fell from 8% in 1984 to 3% in 1999. This improvement was due mainly to the falling incidence

of low income within this group. The percentage of individuals in vulnerable families also fell in New Brunswick.¹¹ In Newfoundland and Labrador, despite a sharp decrease in the incidence of low income, the percentage dropped very little.¹² This was due to a growing fraction of low-income families with no financial wealth.¹³

While the data suggest that the proportion of persons in families with low income and no financial wealth rose among very young families of two or more persons, female lone-parent families, and families of recent immigrants, the evidence must be interpreted with caution.¹⁴ In any event, in 1999, individuals in these families were at least twice as likely to belong to a family with low income and no financial wealth. For female lone-parent families, the proportion (27%) was five times higher than the national average.

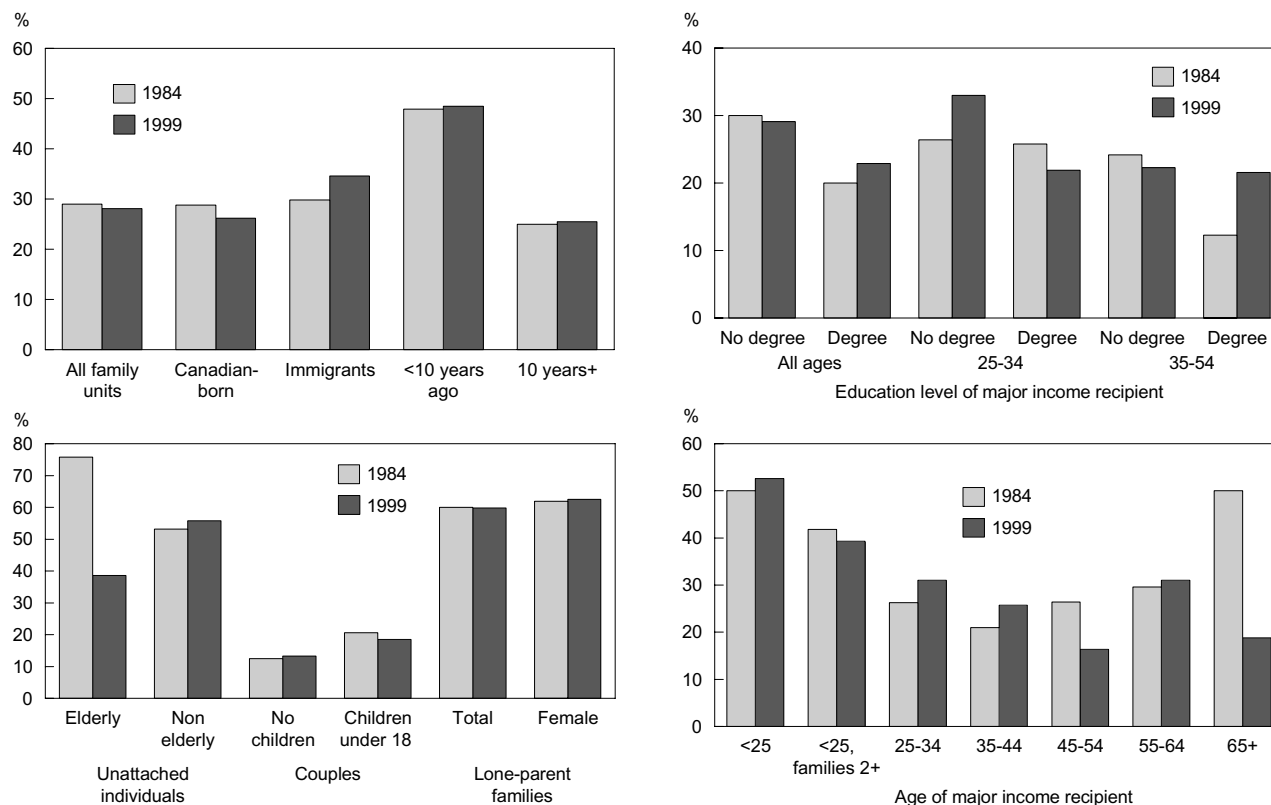
The most vulnerable by far appear to be prime-aged families of two or more persons with no earner, totalling about 900,000 persons or 3% of the population in 1999. In more than 90% of cases, the major income recipient either had a long-term work limitation or disability (33%), was a female lone parent (35%), or was looking for a job for part or all of the year (24%). In 1999, almost 40% of individuals in these families belonged to families with low income and no financial wealth. The corresponding percentage was 13% for individuals living in families whose major income recipient was aged 25 to 54 and had a long-term work limitation.

Low-income families with modest amounts of financial wealth

While 5% of Canadians lived in low-income families with no financial wealth in 1999, 10% were in low-income families with modest amounts of financial wealth (families with insufficient financial wealth to cover their low-income gap). In other words, these low-income families would have remained in low income even if they had liquidated all their financial assets and added the proceeds to their after-tax income.¹⁵ Using this measure, the percentage of individuals in financially vulnerable families remained virtually unchanged at 10% in 1984 and 1999 (Tables 3 and 4).

Once again, elderly unattached individuals became less financially exposed over the period. However, the opposite was true for families of recent immigrants.¹⁶ In 1999, the chances of being in a family with low income and modest amounts of financial

Chart A: While the overall proportion of persons in low income among families with no financial wealth remained virtually unchanged from 1984 to 1999, some groups saw increases.



Sources: Assets and Debts Survey, 1984; Survey of Financial Security, 1999

wealth were four times the national average for individuals living in female lone-parent families (42%), and almost eight times the average for those in prime-aged families with no earner (74%). In contrast, chances were half the average for those in families whose major income recipient was elderly (4%) or a university graduate aged 35 to 54 (5%).

Of all persons in low-income families, roughly 70% were in families with not enough financial wealth to cover the low-income gap (Chart B). This proportion rose to at least 80% in very young families and lone-parent families, but dropped to 44% among elderly families. These estimates are conservative since they do not account for taxes that could be withheld when registered retirement savings plans are liquidated.

Wealth distribution of low-income families

While many would agree that financial wealth is a good indicator of financial vulnerability, most studies of Canadian families who struggle financially or live in straitened circumstances have used data on low income. To what extent do low-income families have relatively low financial wealth?

As measured by median financial wealth, the 'typical' low-income family had \$300 to buffer income interruptions or face unexpected expenses in 1999 (Table 5). This is at least \$20,000 less than other families.¹⁷ Some 75% had less than \$6,000 in assets that could be liquidated.¹⁸ Others were more fortunate—10% had \$32,000 or more.

How did the financial vulnerability of low-income families change during the period? The ratio of the low-income gap to the low-income cutoff is often used by analysts to examine how the economic

Table 3: Persons in families with low income and no financial wealth, by selected demographic characteristics

	Persons in families with					
	Low income		Low income and no financial wealth*		Low income and financial wealth < income gap**	
	1983	1998	1983-84	1998-99	1983-84	1998-99
	%					
All family units	13.8	13.6	5.0	5.3	9.8	9.5
Age of major income recipient (MIR)						
Less than 25	28.8	47.5	13.3	22.7	24.6	38.9
Two or more persons	22.2	34.7	10.0	15.7	18.7	24.9
25 to 34	14.6	18.0	6.3	9.4	11.4	14.6
Couples with children under 18	11.2	14.1	4.9	5.8	8.5	10.5
35 to 44	10.5	12.9	3.8	4.8	8.0	8.8
Couples with children under 18	8.2	9.3	2.7	2.7	6.0	5.5
45 to 54	8.9	8.3	3.1	2.6	6.5	5.4
Couples with children under 18	7.7	7.3	3.0	1.9	5.2	4.6
55 to 64	12.2	12.1	3.1	3.2	6.5	6.6
65 and over	20.3	8.2	4.0	1.4	9.1	3.6
Education level of MIR						
No university degree	15.1	15.1	5.4	6.0	10.7	10.7
25 to 34	16.0	19.9	6.6	10.8	12.5	16.5
35 to 54	11.0	12.3	4.0	4.4	8.4	8.2
University degree	6.1	8.5	2.6	3.0	4.1	5.6
25 to 34	7.7	11.9	4.6	4.9	6.1	8.6
35 to 54	4.3	7.2	1.4	2.3	2.4	4.8
Family type						
Elderly unattached individuals	47.9	21.3	8.3	3.3	19.5	9.4
Other unattached individuals	34.1	37.6	14.7	16.8	26.9	30.0
Couples, no children	6.6	6.8	1.7	1.9	3.6	3.7
Couples, children under 18	9.8	10.3	3.8	3.5	7.1	6.7
Couples, children 18 and over	3.0	3.2	0.6	1.0	1.3	1.2
Elderly couples, no children	5.2	1.5	0.5	0.4	1.6	0.9
Lone-parent families	49.9	44.5	20.7	24.0	42.7	37.5
Female lone-parent	53.6	49.3	21.9	26.7	45.7	42.1
Other family types	14.9	9.8	5.8	3.5	12.1	5.7
Immigration status of MIR						
Canadian-born	13.6	12.2	5.2	5.1	9.9	8.6
Immigrants	14.9	17.9	4.2	6.1	9.6	12.3
Less than 10 years	23.1	35.6	7.3	12.8	15.7	25.6
10 years or more	12.9	11.3	3.4	3.7	8.2	7.4
Families of two or more and MIR aged 25 to 54						
No earners	91.8	83.7	42.6	38.4	86.1	73.7
One earner	17.0	21.8	6.4	8.7	12.0	15.0
Two or more earners	4.3	4.1	1.4	1.3	2.9	2.1
MIR with long-term work limitation						
No	..	9.8	..	3.9	..	6.6
Yes	..	30.1	..	12.9	..	24.1

Sources: Assets and Debts Survey, 1984; Survey of Financial Security, 1999

* Zero or negative.

** The income gap is the difference between a family's low-income cutoff and its after-tax income.

Table 4: Persons in families with low income and no financial wealth, by province

Province	Persons in families with					
	Low income		Low income and no financial wealth*		Low income and financial wealth < income gap**	
	1983	1998	1983-84	1998-99	1983-84	1998-99
	%					
Newfoundland and Labrador	21.9	14.8	10.4	9.1	17.6	13.1
Prince Edward Island	10.3	9.4	4.0	4.8	7.1	5.5
Nova Scotia	12.4	13.0	5.8	7.4	10.1	10.1
New Brunswick	18.9	11.7	10.1	5.9	14.8	8.7
Quebec	15.4	16.4	6.1	6.5	11.4	12.0
Ontario	12.2	11.5	3.9	4.5	8.2	8.1
Manitoba	13.8	15.3	5.0	6.8	10.2	11.6
Saskatchewan	12.8	11.2	4.7	4.6	8.0	7.3
Alberta	14.3	12.2	4.4	3.7	9.6	7.4
British Columbia	14.0	15.9	3.9	5.5	9.4	10.4

Sources: *Assets and Debts Survey, 1984*; *Survey of Financial Security, 1999*

* Zero or negative.

** The income gap is the difference between a family's low income cutoff and its after-tax income.

position of low-income families evolves over time. In 1984, it stood at 34%, indicating that, on average, individuals in low income were in families whose after-tax income was 34% below Statistics Canada's low-income cutoffs. It rose to 38% in 1999, suggesting some deterioration in the well-being of low-income families during this period.¹⁹

Between 1984 and 1999, the percentage of low-income families with no financial wealth rose from 35% to 40%. The average wealth of low-income families in the bottom 75% of the financial wealth distribution dropped slightly (about \$800 in 1999 dollars). Similar patterns were seen in the distribution of net worth. Thus, the average income gap ratio of low income families did not improve between 1984 and 1999. Neither did the average financial wealth nor the average net worth of families in the bottom 75% of the (financial) wealth distribution. Compared with their counterparts in the mid-1980s, many low-income families in the late 1990s were neither closer to the low-income cutoffs nor better off financially.

However, the opposite was true for the 10% richest low-income families—financial wealth and net worth rose at the 90th percentile. As a result, the proportion of low-income families with financial wealth of \$50,000 or more rose from 4% in 1984 to 7% in 1999.

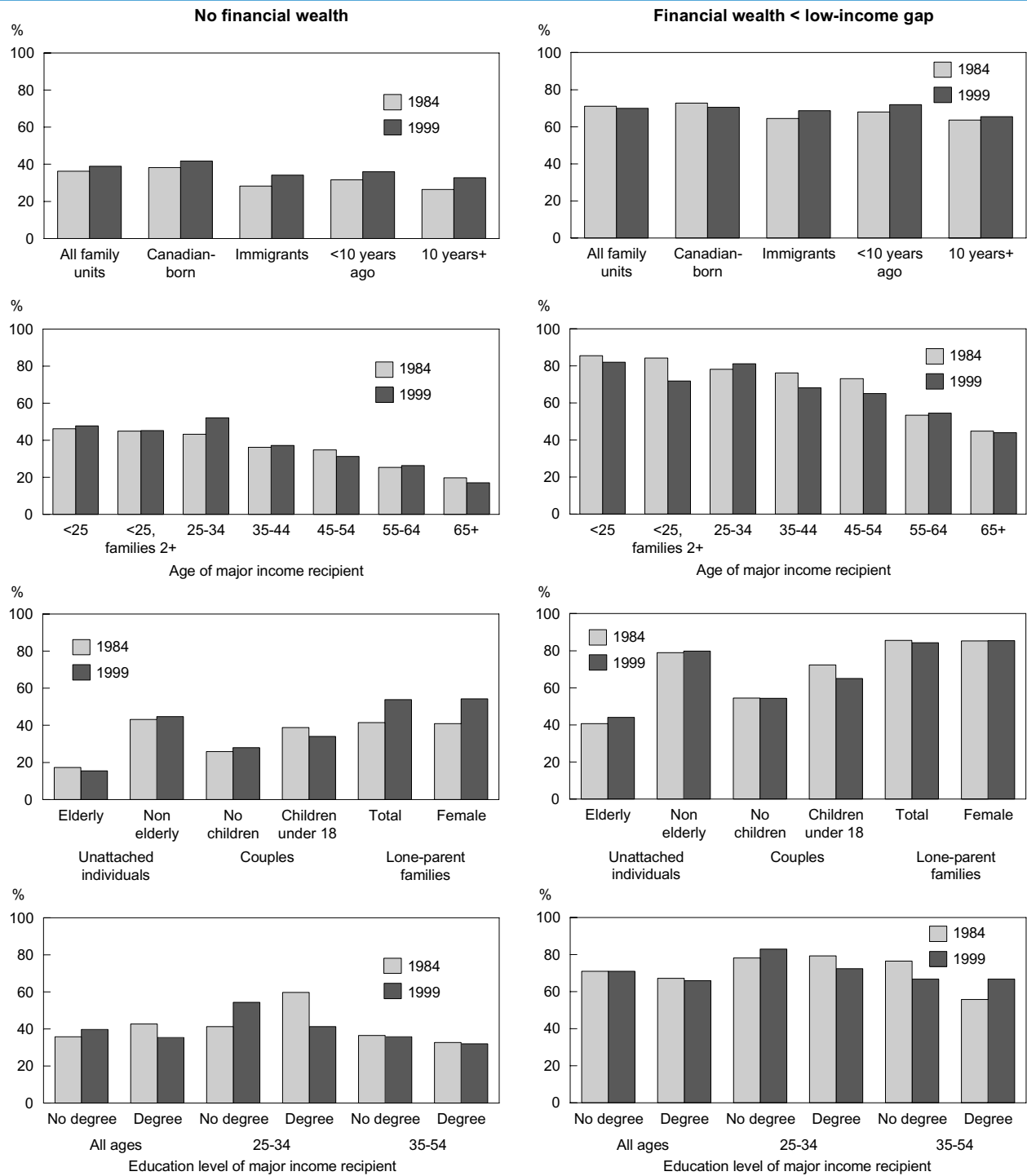
The above numbers include families owning a business. Although representing only 11% of low-income families in 1999, these families may have greater wealth. Excluding them did not change the trend in the average income gap ratio or in the average financial wealth and net worth of low-income families in the bottom 75% of the (financial) wealth distribution (Table 6). However, it did lower the estimates of financial wealth and net worth for all low-income families.

The average financial wealth of low-income families with no business amounted to \$10,900 in 1999, much lower than the \$16,800 for all low-income families. Low-income families with no business had an average net worth of \$31,000, compared with \$51,700 for all low-income families. Three-quarters of low-income families with no business had less than \$3,800 in assets that could be liquidated or less than \$10,000 of net worth, compared with \$5,500 and \$25,000 when families with a business were included (Table 5).²⁰

Financial vulnerability of the unemployed

One would expect families who have recently experienced unemployment to be more financially vulnerable than other families. This may be so for at least two reasons. First, compared with those who remain employed, workers who experience unemployment

Chart B: Persons in low-income families with little or no financial wealth



Sources: Assets and Debts Survey, 1984; Survey of Financial Security, 1999

Table 5: Wealth distribution* of families

	Low-income families		Non low-income families	
	1984	1999	1984	1999
			%	
Persons in low income**	13.8	13.6	...	...
Persons in families owning a principal residence	32.9	27.8	74.2	75.9
Income gap/LICO† of persons in low income**				
All families	34.2	38.4	...	...
Excluding families with negative after-tax income	31.6	33.8	...	...
Financial wealth				
≤ \$0	34.9	39.5	13.8	15.5
\$1 to 4,999	38.8	33.8	15.2	12.1
\$5,000 to 9,999	9.6	6.8	11.4	8.4
\$10,000 to 19,999	6.5	7.1	16.0	12.4
\$20,000 to 49,999	6.1	5.9	20.9	19.3
\$50,000 and over	4.4	7.0	22.8	32.5
			\$	
At 10 th percentile	-2,800	-7,400	-1,500	-3,000
At 25 th percentile	0	-800	3,500	3,500
At 50 th percentile	600	300	15,400	21,500
At 75 th percentile	5,800	5,500	44,800	71,600
At 90 th percentile	20,600	32,000	107,200	180,000
Average financial wealth	6,300	16,800	40,900	77,100
Average financial wealth of bottom 75%	-1,800	-2,600	10,100	15,700
Net worth				
≤ \$0	28.6	35.7	6.7	8.5
\$1 to 4,999	32.1	28.1	7.9	7.2
\$5,000 to 9,999	6.6	5.0	4.8	3.7
\$10,000 to 19,999	4.2	4.4	6.5	5.7
\$20,000 to 49,999	7.1	6.8	13.6	12.5
\$50,000 to 99,999	9.7	6.8	18.6	15.6
\$100,000 and over	11.7	13.3	41.9	46.7
			\$	
At 10 th percentile	-1,500	-6,500	1,500	600
At 25 th percentile	0	-200	18,300	19,500
At 50 th percentile	1,500	800	76,200	87,000
At 75 th percentile	34,100	25,000	167,600	218,600
At 90 th percentile	114,900	143,700	505,100	444,500
Average	37,600	51,700	149,500	202,600
Average of bottom 75%	2,000	-500	55,200	65,700

Sources: Assets and Debts Survey, 1984; Survey of Financial Security, 1999

* In 1999 constant dollars.

** Refers to 1983 and 1998.

† LICO: low income cut-off.

are often less educated and have a lower earnings potential, making them less able to accumulate substantial savings. Second, a family that has recently experienced a

period of unemployment may have been forced to liquidate some of its financial assets, thereby reducing its future financial wealth.²¹

The data confirm this view. In 1999, of all individuals living in families whose major income recipient had been unemployed for some time during the preceding year, more than 30% belonged to families with no financial wealth (Table 7). This percentage is twice as high as that of individuals living in families whose major income recipient had been working full year full time in 1998.

Furthermore, low-income rates were roughly 10 times higher among families with substantial unemployment (27 to 52 weeks) than among those with no unemployment. The implication is obvious. Of all individuals living in families of two or more persons whose major income recipient had worked full year full time in 1998, very few (2% at most) were financially vulnerable. In contrast, of all individuals living in families whose major income recipient was unemployed for at least 27 weeks in 1998, 20% belonged to low-income families with no financial wealth, and fully one-third belonged to low-income families with modest amounts of financial wealth.

Conclusion

Even though the percentage of individuals living in families with low income and little or no financial wealth remained virtually constant between 1984 and 1999, some groups, such as recent immigrants, became more financially vulnerable to income interruptions and unexpected expenses. Others—specifically, elderly unattached individuals—improved their economic position.

The vast majority of low-income families had very little financial wealth. The financial wealth and net worth of low-income families in

Table 6: Wealth distribution* of families without a business

	Low-income families		Non low-income families	
	1984	1999	1984	1999
	%			
Persons in low income**	14.7	14.9	...	...
Persons in families owning a principal residence	26.9	20.9	70.8	72.5
Income gap/LICO† of persons in low income**				
All families	32.1	35.3	...	...
Excluding families with negative after-tax income	31.9	34.3	...	...
Financial wealth				
≤ \$0	34.6	41.9	13.7	16.1
\$1 to 4,999	40.7	35.9	16.5	13.6
\$5,000 to 9,999	9.4	6.7	12.0	8.8
\$10,000 to 19,999	5.8	5.7	16.6	12.9
\$20,000 to 49,999	5.9	4.4	20.8	19.3
\$50,000 and over	3.7	5.4	20.4	29.3
	\$			
At 10 th percentile	-2,100	-7,200	-1,200	-3,000
At 25 th percentile	0	-1,000	3,200	2,500
At 50 th percentile	500	100	13,900	18,500
At 75 th percentile	4,800	3,800	40,000	61,600
At 90 th percentile	18,800	19,600	93,500	153,000
Average financial wealth	6,500	10,900	36,100	61,200
Average financial wealth of bottom 75%	-600	-2,700	9,600	13,300
	%			
Net worth				
≤ \$0	30.5	39.1	7.7	9.8
\$1 to 4,999	34.3	30.6	9.2	8.4
\$5,000 to 9,999	6.8	5.1	5.6	4.2
\$10,000 to 19,999	4.0	4.4	7.3	6.3
\$20,000 to 49,999	7.2	5.9	15.1	13.5
\$50,000 to 99,999	9.0	5.6	19.8	16.3
\$100,000 and over	8.4	9.3	35.4	41.5
	\$			
At 10 th percentile	-1,600	-6,800	800	0
At 25 th percentile	0	-600	12,900	13,300
At 50 th percentile	900	300	61,600	71,300
At 75 th percentile	18,400	10,000	136,600	180,000
At 90 th percentile	87,800	91,500	237,000	342,000
Average	25,000	31,000	98,500	138,800
Average of bottom 75%	800	-1,800	44,100	53,000

Sources: Assets and Debts Survey, 1984; Survey of Financial Security, 1999

* In 1999 constant dollars.

** Refers to 1983 and 1998.

† LICO: low income cut-off.

the bottom 75% of the financial wealth or net worth distribution did not rise during the period. Thus, at the end of the 1990s, the vast majority of low-income fami-

lies had no more savings to protect themselves against adverse events than did their counterparts in the mid-1980s.

While median net worth and financial wealth of other families rose 14% and 40% respectively between 1984 and 1999, that of low-income families did not increase. Therefore, the wealth gap between low-income families and other families rose during the period.

While very young families are relatively vulnerable, an increase in earnings as a result of labour market experience makes it likely that many of these families will have low income and little or no financial wealth for a relatively short period of time. However, this may not be true for female lone-parent families. Previous research has shown that, of all families of two or more persons, lone-parent families are by far the most likely to suffer persistent low income (Morissette and Zhang 2001). This severely limits their ability to build up savings and increase financial wealth. It also likely explains why they have by far the lowest average and median wealth compared with other families (Morissette, Zhang and Drolet 2002). The absence of a second earner poses a severe problem in these families where the parent, most often a woman, may be constrained to choose jobs with shorter hours or close to schools. Taken together, these findings suggest that the high financial vulnerability of many lone-parent families may be more than a temporary state.²² Whether or not this may also be the case for families of recent immigrants is unclear.

In any given year, the most vulnerable families by far were prime-aged families of two or more persons with no earner. Surprisingly, only one-third of persons in these families had a major income recipient with a long-term work limitation or disability in 1999. The majority of the remaining families

Table 7: Financial vulnerability of families, by labour force status of major income recipient in 1998

	All families			Families of two persons or more		
	Worked full year full time	Unemployed 1-26 weeks	Unemployed 27-52 weeks	Worked full year full time	Unemployed 1-26 weeks	Unemployed 27-52 weeks
	%					
Persons in families with						
No net worth	7.1	24.5	29.0	6.3	22.2	25.9
No financial wealth	15.8	33.2	36.5	15.5	32.1	34.5
Low income	4.9	25.4	49.1	4.4	20.1	41.4
Low income and no financial wealth	1.4	12.8	24.0	1.2	10.7	19.7
Low income and modest financial wealth*	2.6	20.3	41.1	2.2	15.6	33.6

Source: Survey of Financial Security, 1999

* Insufficient financial wealth to cover the low-income gap.

Data sources and definitions

The 1984 **Assets and Debts Survey** (ADS) was a supplement to the May 1984 Survey of Consumer Finances. The 1999 **Survey of Financial Security** (SFS) was conducted from May to July 1999. Both samples were based on the Labour Force Survey frame and represented all families and individuals in Canada except residents of the territories, members of households located on Indian reserves, full-time members of the Armed Forces, and residents of institutions.² Data were obtained for all family members aged 15 and over.

The two surveys differed in some aspects. In the ADS, all information on components of assets (except housing) and debts was collected for each member of the family aged 15 years and over and then aggregated to the family level; in contrast, the SFS collected information directly at the family level. Unlike the ADS, the SFS had a supplementary high-income sample (consisting initially of about 2,000 households), which was included to improve the quality of wealth estimates.³ The final ADS sample consisted of 14,029 families, the SFS sample 15,933. (Families include unattached individuals.)

To make the concept of wealth comparable between the two surveys, contents of the home, collectibles and valuables, annuities, and registered retirement income funds, which were not included in the 1984 survey, were excluded from the 1999 data.

The **net worth** of a family is the difference between its total assets and its total debts. Excluded are the value of work-related pension plans, and future entitlements to social security provided by the government in the form of Canada or Quebec Pension Plan benefits and Old Age Security. Also excluded is the family's human capital, measured in terms of the value of the discounted flow of

future earnings for all family members. Families with no net worth have debts equal to or greater than their assets.

In this article, **financial wealth** is defined as net worth minus net equity in housing and net business equity. It measures the stock of assets a family could use relatively quickly to finance consumption—without selling the house, its contents, or the business—in the face of unexpected expenses or a substantial decrease in family income. Financial wealth includes financial assets (such as chequing and savings accounts, guaranteed investment certificates, registered retirement savings plans) and real assets (such as cars, trucks, vans or recreational vehicles). Families with *no* financial wealth have zero or negative financial wealth.

Low income was measured using the low-income cutoffs published by Statistics Canada and based on 1992 family expenditure patterns. When producing low-income rates by province, the 1992 low-income cutoffs after tax and families' after-tax income were converted into 1998 dollars using province-specific consumer price indices.

While the low-income rates derived from the ADS and the SFS refer to 1983 and 1998 respectively, financial wealth and net worth are measured for 1984 and 1999.

Bootstrap methods were used to calculate the standard errors for SFS. Bootstrap samples could not be created properly for ADS because the original weights and other details of the sample were no longer available. To test the statistical significance of changes over time, the standard errors in ADS were assumed to be 25% larger than in SFS. Hypothetical standard errors for 1984 were calculated based on this assumption.

had a major income recipient who was either a female lone parent, or an individual experiencing long-term unemployment or who simply had withdrawn from the labour market. Among these female lone parents and other individuals, almost two-thirds had at most a high school diploma or some postsecondary education. This suggests that lack of education is likely a major factor underlying the financial vulnerability of many prime-aged families with no earner.

The absence of decline in the percentage of persons living in families with no financial wealth is somewhat surprising considering that the population was older at the end of the 1990s than during the mid-1980s and had had more time to accumulate savings.²³ Other factors must have played an offsetting role. The growing importance of lone-parent families and unattached individuals, the increased length of time young people stay in school before entering the labour market, the decline in real earnings of young men, easier access to credit, and changing preferences of consumers may have restricted savings or contributed to indebtedness, thereby reducing the net worth and financial wealth of some families.

Perspectives

Notes

- 1 Love and Oja (1977, 47) examined both income and wealth data and found that 'there are a substantial number of low-income families with significant wealth and also a large number of non low-income families of little wealth.' Wolfson (1979) explored the sensitivity of the Canadian distribution of family income to alternative definitions of income, including wealth in the form of an annuity equivalent, and incorporating home ownership in the form of imputed rent. As expected, he found that defining income to include the value of an annuity that could be purchased by liquidating all net worth leads to an improvement in the economic position of the elderly.
- 2 These include institutions such as penal institutions, psychiatric hospitals, orphanages, and seniors' residences.
- 3 Having a high-income supplement in 1999 increases the precision of wealth statistics (for example, average, median, and inequality measures) compared to ADS, while still leaving them unbiased (like those of ADS).
- 4 All these changes are statistically significant at the 5% level (two-tailed test).
- 5 Prime-aged families are defined as those whose major income recipient is aged 25 to 54.
- 6 Of all persons living in families with no financial wealth in 1984 (1999), 51% (44%) belonged to families who owned a principal residence. The corresponding percentages for persons living in families with positive financial wealth are 72% and 75% for 1984 and 1999 respectively.
- 7 In 1984, families with no financial wealth who were in low income had an average after-tax income of \$10,109 (in 1998 dollars). Families with no financial wealth who were not in low income received at least three times as much with an average after-tax income of \$38,154. The corresponding amounts for 1999 were \$10,485 and \$37,425.
- 8 The drop likely reflects enhancements to Old Age Security, Guaranteed Income Supplement, and Provincial Income Supplements that took place during the period and led to a substantial reduction of low-income rates among the elderly.
- 9 This percentage is slightly higher than the 12.1% estimate from the 1998 Survey of Labour and Income Dynamics.
- 10 In 1999, this proportion was as high as 54% in female lone-parent families and as low as 17% in elderly families. Median financial wealth of low-income families with positive financial wealth amounted to \$3,400 in 1999.
- 11 The decrease in the proportion of elderly unattached individuals having low income and no financial wealth is statistically significant at the 1% level, while the decrease observed in New Brunswick is statistically significant at the 7.5% level.
- 12 Similar patterns are obtained when provincial low income rates are calculated using Canada's consumer price index rather than province-specific consumer price indices.
- 13 Of all persons living in low-income families in Newfoundland and Labrador, 47% belonged to families with no financial wealth in 1984. This percentage rose to 61% in 1999.
- 14 The increases observed for these families are statistically significant only at the 15% level.
- 15 The 1999 wealth figures were converted into 1998 dollars and added to after-tax income received in 1998 to make this calculation.
- 16 Among families of recent immigrants, the increase in the percentage of persons living in families with low income and insufficient financial wealth to cover the low-income gap is statistically significant at the 1% level. Among very young families, the increase observed is not statistically significant at conventional levels.

17 The median financial wealth of other families was \$21,500 in 1999.

18 About 13% had more than \$6,000, but these families had a major income recipient aged at least 45 and so had had a fairly significant period of time to build up their savings. Of the remaining 12%, roughly one-third owned a business. When collectibles and valuables were added to financial wealth, 75% of low-income families had less than \$6,500 of relatively liquid assets.

19 If families with negative after-tax income are excluded, the increase was more moderate, from 32% to 34%.

20 Among families with no business, the proportion of individuals living in low-income families with no financial wealth amounted to 5.3% in 1984 and 6.4% in 1999. For low-income families with modest financial wealth, the figures were 10.7% and 11.3%.

21 A third reason is that experiencing unemployment decreases family income during the current year and increases chances of being in low income during that year.

22 Presumably because of their relatively low levels of both income and wealth, 7% of female lone-parent families had to pawn or sell some of their possessions in 1998, and 32% were behind two months or more in a bill, loan, rent, or mortgage payment. These proportions are much higher than those for the whole population—2% and 14% respectively.

23 Using the Survey of Labour and Income Dynamics (SLID)—instead of the Survey of Financial Security—does not alter the conclusion regarding the absence of an empirically significant decline in the percentage of persons in low-income families with no financial wealth. This percentage equals 4.7% in 1999 (rather than 5.3%) if the low-income rate obtained from SLID (12.1%) is used. Similarly, the percentage of persons in low-income families with insufficient

financial wealth to cover the low-income gap in 1999 equals 8.5% (rather than 9.5%) using SLID. Calculating the low-income rates at the end of a recession in 1983 and in the middle of an expansionary phase in 1998 would also lead one to expect a decrease in the percentage of persons living in low-income with no financial wealth.

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Falling behind

Wendy Pyper

THE HIGH LEVEL OF CONSUMER DEBT has raised some concerns. In October 2001, some 44 million Visa and MasterCard credit cards were in circulation in Canada, with \$39 billion in outstanding balances (Canadian Bankers Association 2002). In 1998, almost 38% of families reported having outstanding credit card or instalment debt. For younger families in which the major income recipient (MIR) was aged 25 to 34, the figure was 50%. Also, many families held student loans—31% of families with a MIR under 25 (Statistics Canada 2001).

The inability of a family to meet its immediate financial commitments may be a warning sign of more serious trouble. With a downturn in the business cycle, which may increase job losses, the potential for widespread difficulties is obvious. To meet the cost of missed bill payments, a family may need to increase its debt. However, because of its poor credit rating, the family may end up borrowing from lenders of last resort, who charge very high interest. The extra burden in the form of increased credit costs becomes part of a downward spiral that could eventually force the family to seek protection in personal bankruptcy. Declaring bankruptcy results in financial hardship not only for the individuals involved, but also for creditors in terms of legal and other costs. Creditors then pass the losses on to customers, either through increased fees or higher interest rates.

Using the 1999 Survey of Financial Security (SFS), this article examines families that fell two or more months behind in a bill, loan, rent or mortgage payment (see *Data source and definitions*). How does the incidence vary by family type, and what are the demographic and socioeconomic characteristics of these families?

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What do we know already?

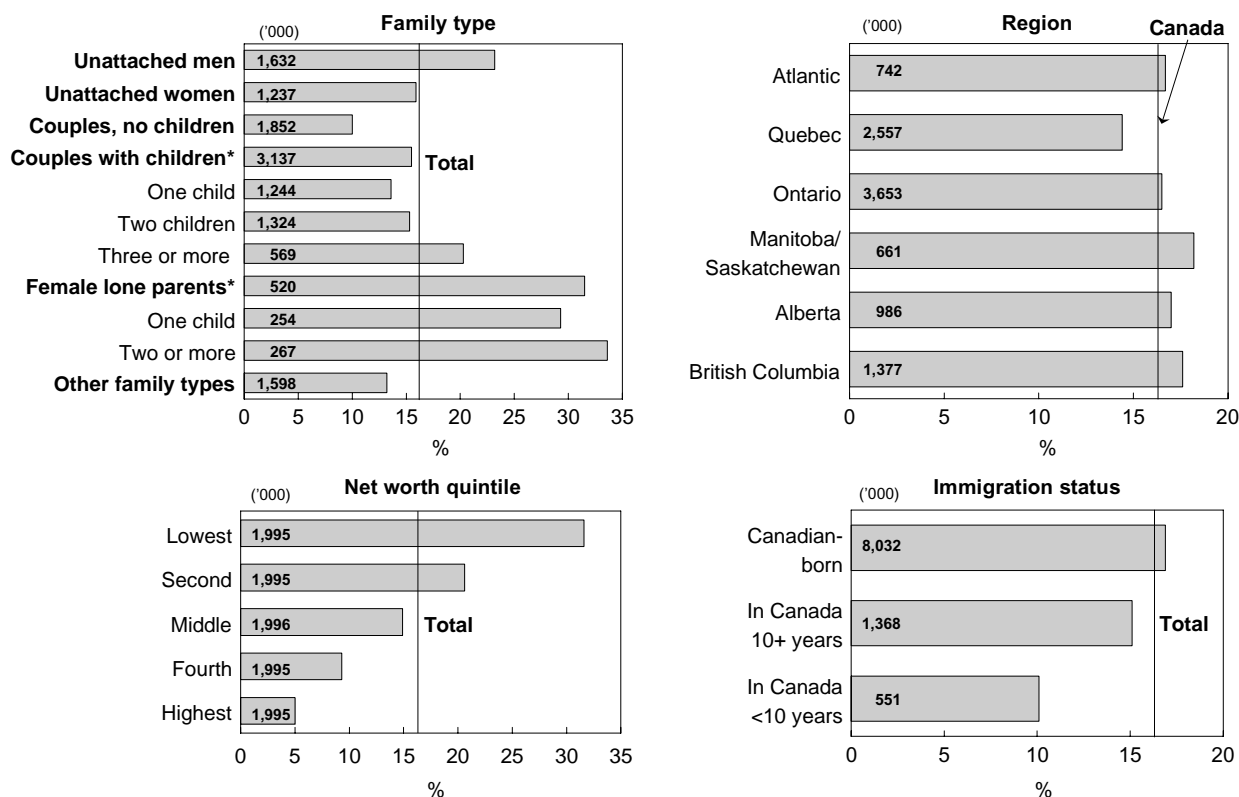
Although not strictly comparable, 1998 American data found that 8.1% of families with debt were 60 days or more behind in a payment at least once during the year (Kennickell, Starr-McCluer and Surette 2000). The incidence of falling behind ranged from 15.1% for the lowest income group to only 1.5% for the highest. Other important characteristics were age of the head of the family and net worth (see *American Survey of Consumer Finances*).

The American literature also deals with delinquency in credit card payment (Stavins 2000). The probability of being delinquent (behind in payments by two months or more) varies as a function of various individual and family characteristics. The strongest factors that increase the probability of delinquency are having filed for bankruptcy in the past and being unemployed at any point during the previous 12 months. Conversely, factors that reduce the probability of delinquency include being married and having health insurance, as well as having high income and net worth. Being older and having more education are also associated with lower probabilities.

One-third of female lone-parent families struggled in 1998

Even though 1998 was a good year economically, one in six families with a MIR aged less than 65 fell behind two months or more in a bill, loan, rent or mortgage payment (Chart A).¹ However, the incidence of falling behind showed considerable variation by family type. Less than 1 in 6 couples with children under 18 fell behind in a payment, compared with almost 1 in 3 female lone-parent families. For unattached men, the rate was almost 1 in 4, while unattached women had about the same rate as couples with children. Couples without children had the lowest incidence (10%). Not surprisingly, difficulty increased with the number of children under 18 living at home. For example, the rate varied from 14% for families with one child to

Chart A: The incidence of falling behind varied most by net worth and family type.



Source: Survey of Financial Security, 1999
 * Children under 18 living at home.

20% for those with three or more children. This pattern also held true for female lone-parent families, but the variation was not as pronounced.

The incidence of falling behind varied only slightly by province. Overall, Quebec had the lowest rate (14%) while British Columbia, and Manitoba and Saskatchewan had the highest (18%). The rate also varied depending on the immigration status of the MIR. Families in which the MIR immigrated to Canada less than 10 years ago were the least likely to fall behind (1 in 10), compared with roughly 1 in 6 Canadian-born and long-term immigrant families (in Canada for at least 10 years).

Since the SFS contains information on both assets and debts of families, net worth can be determined. When families are placed in quintiles based on their net worth, those in the bottom quintile (with negative or low net worth) show a six times higher incidence of falling

behind than those at the top of the distribution. Somewhat surprisingly, 5% of families in the top of the distribution also fell behind.

Youth and the less educated more likely to fall behind

The incidence of missing payments dropped steadily as the age of the MIR increased (Table 1). One-quarter of young families (MIR less than 25) fell behind, compared with only 7% of older families (MIR aged 55 to 64). A similar pattern was observed for each family type, with the youngest families being roughly three times more likely to have fallen behind than the oldest in all cases. Variation existed within each age group. For example, among young families, couples without children had the lowest rate at only 18%, compared with over one-half of female lone-parent families.

Table 1: Incidence of falling behind, by family type and selected characteristics, 1998

	All family types	Unattached men	Unattached women	Couples without children	Couples with children*	Female lone parents*	Other family type
	%						
Total	16.3	23.2	15.9	10.0	15.5	31.5	13.2
Age of MIR							
Under 25	25.0	30.2 ^E	F	18.3 ^E	31.4 ^E	53.0	23.1 ^E
25 to 34	21.9	28.3	22.0 ^E	14.3	20.3	33.2	18.6 ^E
35 to 44	17.3	22.7	16.0 ^E	14.2	14.5	31.1	16.0
45 to 54	12.3	17.2	14.4 ^E	7.3 ^E	11.7	F	12.8
55 to 64	7.1	9.3 ^E	9.8 ^E	5.9	F	F	5.5 ^E
Education of MIR							
Less than high school	20.4	28.7	21.3 ^E	8.9	23.1	35.6	14.2
Graduated high school	18.6	26.1	19.4 ^E	12.4	17.3	29.4	15.1
Non-university certificate	16.8	23.3	15.1	11.3	16.6	31.7	14.0
University degree or certificate	9.4	14.3 ^E	F	6.9 ^E	7.4	26.1 ^E	8.8 ^E
Home ownership status							
Own mortgage-free	5.7	F	F	3.3 ^E	5.7	F	5.9 ^E
Own with mortgage	13.6	14.7 ^E	F	9.4	13.5	20.9 ^E	16.0
Do not own	24.0	26.8	17.7	18.1	27.8	35.8	20.5

Source: Survey of Financial Security, 1999

* Children under 18 living at home.

Rates varied substantially with the MIR's education level. Families in which the MIR had not graduated from high school had a rate of 20%, more than double that of families in which the MIR was a university graduate (9%). For couples with children, less than high-school graduation resulted in a rate three times higher than that of families with a university graduate as the MIR. At each education level, female lone-parent families showed substantially higher rates, reaching some 36% of those with less than high school graduation. On the other hand, couples without children had consistently lower rates, indicating that the presence of children may strain resources. These couples may also be older (without children under 18 living at home), so the lower rates could also be related to age.

One in 4 families who did not own their home fell behind in 1998. Owners without a mortgage had a significantly lower rate—less than 6%. This compares with almost 14% for owners with a mortgage. This pattern existed across all family types, with couples without children generally having the lowest rates. Mortgage-free owners have proportionally lower housing expenditures than do owners with mortgages or renters (Lefebvre 2002). This potentially increases the amount of disposable income available to pay other bills.

Previous financial trouble, future financial trouble

Bankruptcy is a strong indicator of financial trouble. The SFS asks if anyone in the family has ever declared bankruptcy.² For most family types, the rate of falling behind for those who had previously declared bankruptcy was roughly twice as high as for those who had not—30% compared with 15% (Chart B). For unattached women, the rate was 41%, almost three times as high. Although the rate for female lone-parent families was high at over 40%, the rate was high even for those who had never declared bankruptcy (31%).

Income and keeping on top of bill payments

How do the incomes of families who have fallen behind and those who have not compare? One would expect higher income to provide families with the monetary resources to stay on top of their bills. On the whole, the median income of those who made their payments on time was almost 50% higher than the income of those who did not—\$39,000 versus \$26,400 (Table 2). This difference is also apparent for unattached men but is much less pronounced for unattached women (only 19%). In all other types of families, those who did not fall behind had at least 25% higher median income than those who did.

Data source and definitions

The **Survey of Financial Security (SFS)**, which covered roughly 16,000 households, gathered information on the assets and debts of families and unattached individuals between May and July 1999. Information was collected on the value of all major financial and non-financial assets, as well as money owing on mortgages, vehicles, credit cards, student loans, and other debts. The SFS included a 'behaviours and attitudes' section, which questioned respondents about the way they managed their finances. Information from this section was used to determine if a family had fallen behind in a payment.

Family: An economic family or an unattached individual. An economic family is a group of two or more persons living in the same dwelling who are related to each other by blood, marriage, common law, or adoption. This study looked at families whose major income recipient (MIR) was aged less than 65, since older families have very little debt compared with the non-elderly.

Unattached individuals: Persons living alone or with unrelated individuals, such as roommates or lodgers.

Couples without children: Couples (legally married, common-law, or same-sex) with no other relatives present.

Couples with children: Couples with at least one child under 18. Children may be by birth, adopted, step or foster. Other relatives may also be present.

Female lone parent: A mother living with at least one child under age 18.

Other family types: This includes couples living with children 18 or older, male lone-parent families, and other related persons living together (such as siblings).

The **major income recipient (MIR)** is the person in the family with the highest income before tax.

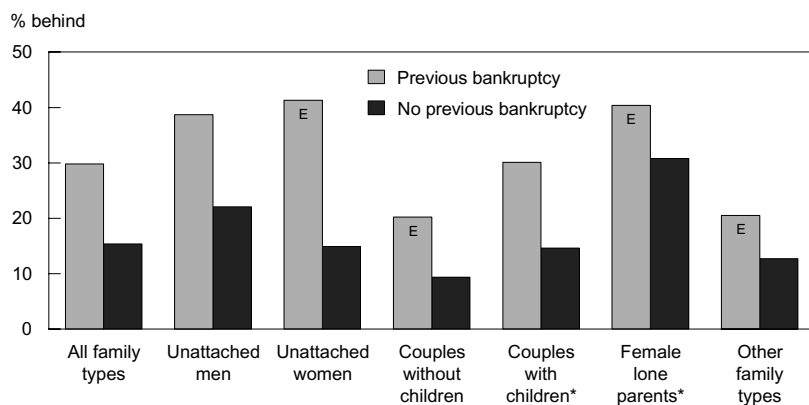
Fallen behind: Being two or more months behind in a bill, loan, rent or mortgage payment. In this article, 'payment' refers to any of these types of payments. The question used to determine if a family had fallen behind was:

In 1998, were (any of) you ever behind two months or more in a bill, loan, rent or mortgage payment?

Respondents were not asked the reason for falling behind. Missing a payment because of being out of town on holidays is quite different from missing a payment for lack of funds. As well, the question does not distinguish between the *types* of payments, the consequences of which can vary widely. For example, falling behind in a mortgage payment may lead to foreclosure, resulting in the loss of a house and the equity a family may have built up. However, falling behind in a telephone bill may lead to interest charges and eventually the disruption of service—a far less serious result.

Net worth: The dollar value difference between total assets and total debts in 1999 dollars—reflecting the value at the time of the survey. Income, however, is reported for the 1998 calendar year in 1998 dollars.

Chart B: Previous bankrupts were more likely to fall behind in payments.



Source: Survey of Financial Security, 1999
* Children under 18 living at home.

However, income is related to many other family characteristics such as age and education, which may account for the differences.

What really matters?

Certain types of families clearly found it difficult to meet their financial obligations—possibly for one or both of two basic reasons. The first is the inability to meet expenditures—a family may simply not have enough income or assets to pay the bills. Periods of unemployment or the number of dependent children may make it difficult to make ends meet. The second reason involves financial management skills. However, many

Table 2: Median after-tax income, by family type, 1998

	Total	Fallen behind (A)	Not fallen behind (B)	Relative difference (B-A)/A
		\$		%
All families	36,700	26,400	39,000	47.7
Unattached men	19,900	14,300	21,500	50.3
Unattached women	15,700	13,500	16,100	19.3
Couples without children	44,700	35,300	45,900	30.0
Couples with children*	48,100	38,800	49,700	28.1
Female lone parents*	20,900	17,500	22,700	29.7
Other family types	50,700	42,000	52,300	24.5

Source: Survey of Financial Security, 1999

* Children under 18 living at home.

characteristics are interrelated. For example, income may reflect the educational attainment in families; similarly, young families generally do not own their home mortgage-free. In order to get a clearer picture of the relative importance of various characteristics, a logistic regression was used (see *Logistic regression*). This allowed, for example, the relationship between income and falling behind to be examined, with all other specified characteristics held constant.

Older, more educated less likely to fall behind

Characteristics of the MIR that remained important after other characteristics such as family type, income and net worth were controlled for included age, education and unemployment. Relative to the reference group (MIR aged 25 to 34), older families (MIR 45 or over) and older unattached individuals (35 or older) were less likely to have difficulty making timely payments (Table 3). This may indicate that better money management skills come with age. Families in which the MIR had a university degree had a 40% lower probability of falling behind than those in which the highest level was high-

school graduation. Families of recent immigrants (those in which the MIR had immigrated within the past 10 years) were less likely to have fallen behind than Canadian-born families or immigrant families who had been in Canada for more than 10 years. Any period of unemployment³ of the MIR was related to higher probabilities of

falling behind, varying from 1.4 (for married couples) to 1.9 times (for unattached individuals) as likely as those with no unemployment spells. This difference is not surprising, since couples may be supplementing the income of the MIR with spousal income. Couples in which the spouse experienced unemployment were more likely to have fallen behind.

Number of children associated with falling behind

Larger families (three or more children) differed significantly from families with two children (1.2 times as likely to have fallen behind), even after key characteristics such as income and age were controlled for. Perhaps the time crunch some large families experience is important when it comes to paying bills on time. For couples, the absence of children was associated with a lower probability of falling behind (0.6 or 40% less than for families with two children).

American Survey of Consumer Finances

The **Survey of Consumer Finances** (SCF), conducted by the Federal Reserve Board in the United States, asks families about their income, assets and debts. It also has several questions related to falling behind. Respondents are asked if loan or mortgage payments were made as scheduled, and if they were ever behind in payments by two months or more.

Several important differences between the American SCF and the Canadian Survey of Financial Security (SFS) make direct comparison difficult. For example, the definition of a family is somewhat different. In the SFS, the unit of analysis is either an economic family or unattached individual (see *Data source and definitions*). In the American SCF, the unit of analysis is the 'primary economic unit' (PEU). The PEU consists of an 'economically dominant' single individual or couple in a household and all other individuals in the household who are financially dependent on that individual or couple. For more details on the American SCF, see *Codebook for 1998 Survey of Consumer Finances*, listed in the references.

Another difference is the question used to measure falling behind. The SFS asks if any family members were ever behind two months or more in a bill, loan, rent or mortgage payment. However, the American question restricts the payments to credit cards, mortgages on primary residences and vacation properties, and loans for purchasing all types of consumables such as vehicles, appliances, furniture, and those related to education. Bills such as hydro, cablevision, and insurance are not included. This may explain some of the difference between the American and Canadian results.

Table 3: Relative probability of falling behind in payments, 1998

	All families	Couples	Unattached individuals
MIR: Less than 25	0.8	n.s.	0.7*
25 to 34	1.0	n.s.	1.0
35 to 44	0.9	n.s.	0.8*
45 to 54	0.8*	n.s.	0.6*
55 to 64	0.5*	n.s.	0.4*
Less than high school	1.1	1.1	1.2
Graduated high school	1.0	1.0	1.0
Non-university certificate	0.9	1.1	0.8
University degree or certificate	0.6*	0.6*	0.6*
Canadian-born or immigrated 10 or more years ago	1.0	1.0	1.0
Immigrated less than 10 years ago	0.4*	0.3*	0.3
Unknown immigration status	1.2	1.5	0.9
Female	n.s.	n.s.	1.0
Male	n.s.	n.s.	1.2
No unemployment	1.0	1.0	1.0
Some unemployment	1.6*	1.4*	1.9*
Spouse: No unemployment	n.s.	1.0	...
Some unemployment	n.s.	1.5*	...
Unattached men	1.2	...	...
Unattached women	0.9	...	...
Couples without children	0.9	...	...
Couples with children**	1.0	...	...
Female lone parents**	1.3*	...	...
Other family types	1.3	...	...
No children	0.7	0.6*	...
One child	0.9	0.8	...
Two children	1.0	1.0	...
Three or more children	1.2*	1.3*	...
Outstanding student loans	1.4*	1.4*	1.4*
No outstanding student loans	1.0	1.0	1.0
Previous bankruptcy	1.6*	1.4*	2.1*
No previous bankruptcy	1.0	1.0	1.0
After-tax income: At 25 th percentile	1.1*	1.1*	n.s.
At median	1.0	1.0	n.s.
At 75 th percentile	0.8*	0.9*	n.s.
Net worth: At 25 th percentile	1.1*	1.1*	1.0*
At median	1.0	1.0	1.0
At 75 th percentile	0.9*	0.9*	0.8*
Homeowner, no mortgage	0.6*	0.5*	n.s.
Homeowner with mortgage	1.0	1.0	n.s.
Do not own	1.2*	1.5*	n.s.
Atlantic	0.8	0.9	n.s.
Quebec	0.7*	0.6*	n.s.
Ontario	1.0	1.0	n.s.
Manitoba/Saskatchewan	1.0	1.1	n.s.
Alberta	1.0	1.0	n.s.
British Columbia	1.0	1.0	n.s.

Source: Survey of Financial Security, 1999

Note: Probabilities are calculated at the mean values of the explanatory variables with the exception of after-tax income and net worth. For these variables, the median values are used. Probabilities are calculated relative to a reference group.

* Significantly different from the reference group at the 5% level.

** Children under 18 living at home.

n.s. No categories were statistically significant, so this variable was not included in the logistic regression.

Although differences appeared in the incidence of falling behind by family type (Chart A), most of these were eliminated when the characteristics of the families were controlled for. The one exception was female lone-parent families who were 1.3 times more likely than couples with children to have fallen behind.

Having outstanding student loans was also associated with a higher chance of falling behind. For each population, those with student loans were 1.4 times more likely than those without to have trouble making payments on time.

Previous bankruptcy a significant factor

As noted earlier, families who had experienced bankruptcy differed significantly from those who had not. After other characteristics were controlled for, families with a previous bankruptcy were 1.6 times more likely to have trouble keeping up with their payments. This is consistent with other findings (Stavins 2000). For unattached individuals, those who had declared bankruptcy were twice as likely to have fallen behind in payments, suggesting a lack of money management skills.

Income, net worth significant but with no large effects

After-tax income and net worth, while significant in most cases, were associated with only small differences in the probability of falling behind. The probability for families at the 25th percentile of the after-tax income distribution (\$21,100) or at the 75th percentile (\$55,700) was only slightly different than for median-income families. Similarly, families with a net worth at the 25th percentile (\$11,700) or at the 75th percentile (\$192,400) showed only a slight

Logistic regression

Logistic regression models are used to investigate the relationship between a discrete outcome (in this case, falling behind or not) and a set of explanatory variables. Coefficients from the model give the probability of falling behind for a selected level of an explanatory variable (compared with the reference group), when all other explanatory variables are held constant. The relative probability is then calculated, expressing the probability relative to the reference group. This article used bootstrap weights to estimate the standard errors to account for the complex sample design used in the SFS.

Three populations were examined. All non-elderly families were modelled, and then couples (with or without children) and unattached individuals were modelled separately. The population of lone-parent families was too small to examine separately and the population of 'other family types' was too diverse.

Extreme values exist in both income and net worth, and they can affect the results of the logistic regression. Because of this, the top and bottom 1% of families, based on after-tax income and net worth, were excluded.

difference relative to families at the median (\$36,700). Falling behind may be more a reflection of unmeasured characteristics such as attitude or management skills (time or money) than a symptom of lack of financial resources.

Summary

One in 6 Canadian families had difficulty making timely payments in 1998, with vast differences between family types. But, after various characteristics were controlled for, only female lone-parent families were significantly different from other families. These families were 1.3 times as likely as couples with children to have fallen behind. The number of children in the family also mattered, indicating that time resources may be stretched in these families. Families with an older MIR were less likely to have fallen behind, as were those in which the MIR was a university graduate.

Financial characteristics of families are also related to falling behind in payments. Families with a previous bankruptcy were 1.6 times more likely than other families to have fallen behind. Despite being significant, income and net worth had only small effects on the probability of falling behind after other family characteristics were controlled for.

Widespread concern that consumers may be pushing the limits in terms of debt level—due in part to the proliferation of credit cards—and that they may be unable to repay their debts continues to be raised. Understanding who is most at risk of financial difficulty may sharpen the focus of campaigns to improve financial management.

Perspectives

Notes

- 1 This rate is high relative to the American result of 8.1%, but important differences make direct comparison impossible (see *American Survey of Consumer Finances*).
- 2 This question does not ask how long ago the bankruptcy occurred.
- 3 'Unemployment' refers to time without a job or business but looking and available for work.

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Better jobs in the new economy?

Marie Drolet and René Morissette

TECHNOLOGICAL CHANGE has always had a substantial influence on the workplace, altering production processes and affecting the way jobs are done. The accelerated pace of change at the end of the twentieth century spurred interest in firms and workers directly involved in generating new technologies and products. Employees in these knowledge-based workplaces are generally seen as working long hours, under pressure to generate a new product in a very competitive environment. It is generally assumed that they are well paid, not only through direct wages, but also through stock options or other forms of remuneration.

This article explores these notions using the 1999 Workplace and Employee Survey. It compares jobs in knowledge-based industries with those in other sectors of the economy. The focus is on industries that conduct a higher-than-average level of research and development, and in which professionals such as scientists and engineers make up a substantial proportion of the workforce. These industries tend to be *producers* of knowledge-based technologies in information, communications and technology industries, and other science-based sectors such as pharmaceuticals (see *Data source and definitions*).

Knowledge-based firms employed about 7% of workers in 1999—3% of them in information and communication technology (ICT) industries (Table 1). Conversely, 1% were employed in ICT workplaces not belonging to knowledge-based industries.

In this article, industries are classified into five mutually exclusive groups: knowledge-based in the goods sector, knowledge-based in the service sector, other goods-producing, retail trade and consumer services, and professional and other services.⁴

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Do knowledge-based firms pay higher wages, offer better fringe benefits, or have more family-friendly practices than other workplaces? If so, do they require longer workweeks from their workers? How do job satisfaction and pay satisfaction compare with other workplaces? Are workers more likely or less likely to be unionized than those in other workplaces? Do knowledge-based workplaces tend more to adopt what is often viewed as high performance work practices (teamwork, job rotation, and formal grievance systems)?

Work schedules

In 1999, employees in knowledge-based workplaces worked an average of 43.4 hours per week—at least 4.0 hours more than workers in professional and other services, or in retail trade and consumer services (Table 2), but less than employees in other goods-producing industries (44.6).

Table 1: Employment and workplaces by industry, 1999

	Employment	Workplaces
		%
Knowledge-based	7.4	4.6
ICT	2.8	2.0
All other	4.6	2.6
Goods-producing	4.0	1.3
Service-producing	3.4	3.3
Other	92.6	95.4
ICT	1.1	0.9
All other	91.5	94.5
Goods-producing	20.2	16.6
Consumer services and retail trade	21.4	28.2
Professional and other services	51.0	50.6

Source: Workplace and Employee Survey

Data source and definitions

The **Workplace and Employee Survey (WES)** is a linked file consisting of both employer and employee components. Employers are sampled by physical location—the statistical unit that corresponds most closely to the concept of a workplace in which employer and employee activities can be linked. Employees are then sampled within each location from employer-provided lists.

The initial wave of WES was conducted during the summer and fall of 1999. Usable information was collected from 6,351 business locations and 24,597 employees, representing response rates of 94% and 83% respectively. This article used responses from 23,296 employees aged 18 to 64 in the private sector.

The survey covers a broad range of topics such as technology adoption, innovation, human resource practices, labour turnover and business strategies, among others.

Knowledge-based industries spend a relatively large amount of resources on research and development and a substantial proportion of their workforce is made up of

professionals, such as scientists and engineers (Lee and Has 1996).¹ The definition is restricted to industries that *produce* knowledge-based technologies, products and services. Industries that *use* such technologies are not classified as knowledge-based.²

The issue of classification requires three additional clarifications. First, knowledge-based industries are found in both the goods sector and the service sector. Second, they include most but not all industries in the information and communication technology (ICT) sector—for instance, telecommunications, data processing, computer systems design and related services, as well as the manufacture of computer and peripheral equipment, communications equipment, and semiconductor and other electronic components. Excluded are wholesaler-distributors of office and store machinery and equipment. Third, knowledge-based industries include many non-ICT industries, such as in pharmaceutical and chemical manufacturing (see Appendices A and B for detailed lists of knowledge-based and ICT industries).³

Since knowledge-based firms employ relatively few part-time workers (usual weekly hours less than 30), these numbers could overstate the differences in work-hours among full-time workers.⁵

This is indeed the case. With an average workweek of 44.0 hours, full-time workers in knowledge-based firms worked at least 1.1 hours more than those in professional and other services (42.9) or in retail trade and consumer services (41.8) (Table 2)—but once again, less than full-time employees in other goods-producing industries (45.2).

Differences in workhours varied by education level. University graduates employed full time in knowledge-based workplaces worked fully two hours more than those in professional and other services, or in retail trade and consumer services. However, full-time employees with some postsecondary education or less did not work longer hours, on average, than their counterparts in other industries.

University graduates employed full time in knowledge-based workplaces worked fairly long hours (46.6), but their average workweek was very similar to that of their counterparts in other goods-producing industries (46.7). Interestingly, those employed in goods-producing, knowledge-based workplaces worked two hours more of unpaid overtime (5.7) than those in other goods-producing industries (3.7). Thus, compared with their counterparts in the rest of the economy, university graduates in knowledge-based workplaces worked either longer hours or more hours of unpaid overtime.

Table 2: Work hours by industry and education, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Consumer	Professional
All employees	43.4	43.6	43.2	39.7	44.6	35.7	39.4
High school or less	42.1	43.0	40.4	39.6	44.3	34.9	40.0
Some postsecondary	41.9	42.4	41.3	38.9	44.6	35.2	38.2
University degree	46.4	46.9	46.1	41.8	46.3	40.5	41.3
Full-time employees	44.0	43.9	44.1	43.3	45.2	41.8	42.9
High school or less	42.8	43.4	41.8	43.3	44.9	41.7	43.0
Some postsecondary	42.7	42.7	42.6	42.7	45.2	41.3	42.1
University degree	46.6	46.9	46.4	44.7	46.7	44.4	44.3
Unpaid overtime							
University degree*	5.3	5.7	5.0	4.7	3.7	2.2	5.3

Source: Workplace and Employee Survey
* Full-time employees.

Hourly earnings

Employees in knowledge-based workplaces averaged \$24.09 per hour in 1999, 32% more than those in other industries (\$18.19) (Table 3). The wage gap between knowledge-based industries and other industries was smaller for university graduates (14%) than for workers with some postsecondary education (31%).

Several reasons can be advanced why workers in knowledge-based industries earn relatively high wages. First, they are generally better educated; roughly 40% of workers in knowledge-based services had a university degree compared with 25% in professional and other services, and 11% in retail trade and consumer services.⁶ Second, they tend to be employed in larger workplaces, which generally offer higher wages (Brown, Hamilton and Medoff 1990; Morissette 1993). Third, they may receive higher wages to defer the relatively high costs of living in larger areas, where knowledge-based workplaces tend to be located. Fourth, many are in high-paying professional occupations such as engineering and science. Finally, some—especially university graduates—could be receiving higher wages as compensation for their relatively long workhours.

After these five factors are controlled for, the wage gap between workers in knowledge-based workplaces and other workers drops to 8%.⁷ What could account for the remaining difference? Perhaps work effort is greater in knowledge-based workplaces. Or perhaps workers have more responsibility and perform a more diversified set of tasks.⁸ A third possibility is that knowledge-based workplaces have more market

Table 3: Hourly earnings by industry and education, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Consumer	Professional
	\$						
All employees	24.09	23.40	24.88	18.19	19.64	12.61	19.96
High school or less	18.96	18.23	20.26	15.09	17.11	11.11	16.71
Some post-secondary	22.54	22.43	22.70	17.18	19.96	12.68	17.93
University degree	29.22	29.96	28.73	25.73	26.92	17.67	26.95
Full-time employees	24.24	23.48	25.14	18.66	19.68	13.41	20.10
High school or less	18.97	18.21	20.38	15.57	17.07	11.37	16.93
Some post-secondary	22.70	22.53	22.96	17.67	20.02	13.70	18.03
University degree	29.31	29.97	28.86	25.77	27.05	18.08	26.84

Source: Workplace and Employee Survey

power than other workplaces and share part of their profits with their workers. It is therefore unclear whether the remaining wage difference reflects a wage premium or compensation for greater work effort or more responsibilities.

Fringe benefits

Employees in knowledge-based industries are not necessarily better covered by registered pension plans than other workers. Just 40% of employees in service-producing, knowledge-based workplaces had a pension plan, compared with 48% of their counterparts in professional and other services (Table 4). This does not necessarily imply that employees in knowledge-based firms have less generous compensation packages. Employees in service-producing, knowledge-based firms were five times more likely to receive stock options (31%) than employees in professional and other services (6%).⁹ They were also more likely to have group registered retirement savings plans.¹⁰

Fringe benefit packages contain more than just retirement plans. On average, employees in the knowledge-based sector were more likely than other workers to be covered by life/disability insurance, supplemental medical insurance, and dental plans.

Personal and family support programs

Media reports have suggested that high-tech workplaces offer fitness facilities to help employees cope with relatively long workhours. Indeed, roughly 25% of employees in knowledge-based workplaces had fitness and recreation services provided (on- or off-site). The corresponding numbers for other goods-producing industries, professional and other services, and retail trade and consumer services were 15%, 17% and 5% respectively. Knowledge-based firms also offered employee assistance programs (counselling, substance abuse control, financial assistance, legal aid) more often than those in other goods-producing industries, and retail trade and

Table 4: Workers receiving fringe benefits, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Con-sumer	Profes-sional
	%						
Registered pension plan	51.1	60.5	40.3	40.4	46.0	16.8	48.2
Group RRSP	31.8	34.8	28.3	17.4	23.1	10.2	18.1
Stock purchase plan	23.5	16.6	31.4	6.8	10.1	6.4	5.7
Life/disability insurance	78.8	84.3	72.5	57.2	67.8	34.3	62.6
Supplemental medical	74.2	78.1	69.8	53.6	64.3	32.3	58.3
Dental plan	76.7	82.1	70.6	52.3	62.5	32.3	56.5

Source: Workplace and Employee Survey

consumer services. However, similar to other industries, knowledge-based workplaces offered child care services (on- or off-site) rather infrequently (7%).

Overqualification

It is reasonable to assume that the quality of a match between a job and the employee is higher when the educational requirements of the job match the worker's education level. If so, workers in service-producing knowledge-based workplaces appeared to enjoy good matches more often than workers in other industries. Almost half (45%) were in jobs in which their education level equalled the minimum requirements. This proportion was higher than in professional and other services (36%), retail trade and consumer services (21%), and other goods-producing industries (27%). In contrast, workers in goods-producing, knowledge-based workplaces reported being undereducated more often than other workers.¹¹

Workers in retail trade and consumer services were more likely to report that their job had no

minimum educational requirement. If it did, they reported being overqualified much more often. This is not surprising given the relatively low skill levels associated with jobs in this sector.

Flexible work practices

Flexible work practices such as teamwork and job rotation are generally assumed to affect the way workers experience their work through a variety of psycho-social variables (Godard 2001). If work-

ers are allowed to perform a diversified set of tasks, morale may be increased through a greater sense of control. While teamwork is pleasant for workers who like more varied work, it may require greater effort from others, such as low-ability workers who must satisfy the norm regarding productivity.¹² Similarly, job rotation may be stressful for individuals who do not adapt easily to new tasks.

To what extent are employees in knowledge-based workplaces frequently involved in teamwork and job rotation? Workers in knowledge-based workplaces with more than 10 employees, like their counterparts in other industries, participated only rarely (6% to 7%)¹³ in job rotation programs (Table 7). However, they appeared to be involved in self-directed workgroups—the most intense form of teamwork—more often (52%) than workers in other industries (41%). This greater incidence of teamwork in knowledge-based workplaces is consistent with the notion that teams may be more valuable in technologically complex environments (Boning, Ichniowski and Shaw 2001).¹⁴

Table 5: Workers whose employer offered personal and family support programs, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Con-sumer	Profes-sional
	%						
Any family/personal support program	45.2	46.4	43.8	30.6	31.3	11.2	38.5
Employee assistance programs	40.2	43.1	37.0	27.2	28.5	7.9	34.8
Fitness	25.9	26.2	25.5	13.6	14.5	4.7	17.0
Childcare	7.2	7.5	6.8	6.1	3.8	1.3	9.0

Source: Workplace and Employee Survey

Table 6: Education and job match, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Consumer	Professional
	%						
No educational requirements in job	5.8	6.9	4.4	16.3	19.5	28.0	10.1
Over-educated	32.2	33.6	30.5	37.6	36.7	42.4	35.9
Under-educated	21.9	23.3	20.3	15.3	16.6	8.5	17.7
Education-job match	40.2	36.2	44.7	30.9	27.2	21.2	36.4

Source: Workplace and Employee Survey

Despite their relatively low unionization rate, workers in service-producing, knowledge-based workplaces reported the presence of a dispute, complaint or grievance system fairly frequently—42% compared with 61% in goods-producing, knowledge-based workplaces. However, the system may have been informal, with only management as the final authority to settle disputes. A more meaningful question would be whether service-producing, knowledge-based workplaces are less likely to

Performance appraisal

At least 65% of employees in knowledge-based workplaces had their job performance evaluated through a standard process, compared with only 45% to 58% in other industries (Table 8).¹⁵ Accordingly, employees in knowledge-based workplaces were almost twice as likely as other workers to find their pay or benefits directly affected by job evaluation results. While performance appraisal may represent a challenge or opportunity for some workers, it may be stressful for others.

Union status

Employees in knowledge-based workplaces were less likely to be unionized (20%) than those in professional and other services or in other goods-producing industries (33%). However, substantial differences existed within the knowledge-based sector. Goods-producing workplaces were almost twice as likely to be unionized (25%) as service-producing ones (14%). The unionization rate in service-producing, knowledge-based industries was very similar to that in retail trade and consumer services.

Table 7: Workers participating frequently/always in flexible work practices,* 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Consumer	Professional
	%						
Employee suggestion programs	31.1	34.2	26.9	29.1	26.2	24.5	32.0
Job rotation/cross-training	6.7	7.4	5.8	6.2	8.6	6.6	5.1
Task teams	16.1	19.6	11.3	15.4	16.4	14.9	15.1
Quality circles	28.0	29.2	26.4	23.1	26.3	21.0	22.6
Self-directed workgroups	52.4	53.5	50.7	41.2	41.9	33.4	43.8

Source: Workplace and Employee Survey

* Workplaces with more than 10 employees.

Table 8: Performance appraisal, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Consumer	Professional
	%						
By standard process	68.3	70.8	65.4	52.9	48.5	45.1	57.9
Influences pay or benefits	49.8	51.5	47.8	25.7	26.1	21.7	27.2

Source: Workplace and Employee Survey

Table 9: Union status and formal grievance systems, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Con-sumer	Profes-sional
	%						
Covered by a collective agreement	20.0	25.4	13.8	28.8	33.4	13.4	33.4
Dispute system at work	52.2	60.7	42.4	48.9	49.4	35.6	54.3
Formal grievance system at work and final decision with labour management committee/outside arbitrator*	32.7	45.9	17.5	33.4	37.6	13.4	40.7

Source: Workplace and Employee Survey
* Employee-weighted workplace response.

have a formal grievance system, where the final authority to settle disputes is held by either a labour-management committee or an outside arbitrator.

The answer is yes. Like their counterparts in retail trade and consumer services, less than 20% of employees in service-producing, knowledge-based workplaces had a formal grievance system. This proportion is much smaller than in goods-producing, knowledge-based workplaces (46%), professional and other services (41%), and other goods-producing industries (38%).

Job satisfaction

Workers in knowledge-based industries were very satisfied with their job more often than workers in other industries (41% and 34% respectively). However, those in service-producing, knowledge-based workplaces were not necessarily more satisfied with their pay. In contrast, 27% of workers in goods-producing, knowledge-based workplaces reported being very satisfied with their pay (simi-

lar to other goods-producing industries), compared with only 16% of workers in retail trade and consumer services.¹⁶ These differences in job satisfaction and satisfaction with pay must be interpreted with caution since they likely capture differences across individuals in intrinsic satisfaction levels as well as differences in job quality (Hamermesh 2001).

Wage trends in the CT sector

It is well known that employment fell in the computer and telecommunications (CT) sector in 2001 (Bowlby and Langlois 2002).¹⁷ Since ICT industries are an important component of knowledge-based industries and since roughly 88% of ICT employees work in the CT sector, it is worth investigating how wages in the CT sector evolved relative to the rest of the economy during the 1997-2002 period. Did workers who kept their jobs in the CT sector see their wages fall relative to other workers?

The answer is no. Hourly wages in the CT sector did not fall relative to the rest of the economy. In March 1997, workers in the CT sector received 22% higher wages than workers in other industries (Table 11). In March 2002, the proportion was 33%. A similar pattern was observed for workers with at least some postsecondary education. Thus, the raw data suggest, if anything, an improvement in the relative wages of CT workers.

Table 10: Job satisfaction, 1999

	Knowledge-based			Other			
	Total	Goods	Services	Total	Goods	Con-sumer	Profes-sional
	%						
Satisfaction with job							
Very satisfied	40.9	42.5	39.1	34.3	34.9	33.0	34.7
Satisfied	51.9	50.6	53.5	54.6	56.0	55.5	53.7
Dissatisfied/no opinion	7.2	6.9	7.4	11.1	9.1	11.5	11.6
Satisfaction with pay							
Very satisfied	23.6	26.7	19.9	18.7	23.9	16.3	17.7
Satisfied	58.1	55.9	60.6	54.7	54.6	57.6	53.6
Dissatisfied/no opinion	18.3	17.4	19.5	26.6	21.5	26.1	28.7

Source: Workplace and Employee Survey

Table 11: Hourly wages in the CT sector and other industries*

	CT sector	Non CT sector	CT advantage
	1999 \$		%
All workers			
1997	19.57	15.99	22.4
1998	19.81	15.96	24.1
1999	20.96	16.13	29.9
2000	20.83	16.12	29.2
2001	22.12	16.23	36.3
2002	21.95	16.53	32.8
Workers with high school or less			
1997	17.09	13.42	27.4
1998	16.31	13.35	22.2
1999	18.32	13.40	36.7
2000	16.44	13.61	20.8
2001	17.38	13.52	28.6
2002	17.34	13.51	28.3
Workers with some post-secondary education			
1997	18.58	15.67	18.6
1998	18.54	15.70	18.1
1999	19.49	15.88	22.7
2000	19.66	15.73	25.0
2001	20.63	15.84	30.2
2002	20.45	16.24	26.0
Workers with a university degree			
1997	23.38	21.97	6.4
1998	23.91	21.79	9.7
1999	24.50	22.06	11.1
2000	24.55	21.92	12.0
2001	26.07	21.94	18.9
2002	26.15	22.59	15.8

Source: Labour Force Survey

* Main job held in March by paid workers aged 18 to 64.

This apparent improvement may be misleading if CT establishments laid off mainly employees with relatively low levels of seniority during 2001.¹⁸ If so, two patterns would be observed. First, relative wages in the CT sector would have improved mainly because the remaining employees in CT industries would have seniority with their company. Second, relative wages in the CT sector would not change as much after controlling for differences in workers' seniority.

This is indeed the case. After controlling for seniority and occupation (among other factors), relative wages in the CT sector did *not* increase. Workers in the CT sector received 4% higher wages than those in other industries, both in March 1997 and in March 2002.¹⁹ Hence, both the raw data and the data adjusted for

seniority indicate that the decline in employment of the CT sector in 2001 was not associated with a decline in relative wages for employees who retained their jobs in this sector.

Summary

Are jobs in knowledge-based firms better jobs? The answer is "It depends." On the one hand, workers in these firms received high wages, had good fringe benefits, profited from fitness and recreation services as well as employee assistance programs and were often in jobs whose requirements matched their education level. On the other hand, some of them worked fairly long hours, and those in service-producing, knowledge-based workplaces were less likely to have a formal grievance system.

What is clear is that jobs in knowledge-based firms have several desirable characteristics. However, several other dimensions have not been analyzed—for instance, work intensity, the need to adapt to technological change, and level of stress. These factors could also explain why earnings were higher in service-producing, knowledge-based firms, and why workers in such workplaces were not more satisfied with their pay than workers in other goods-producing industries.

Perspectives

Notes

1 Lee and Has (1996) divide industries on the basis of three R&D measures: the R&D-to-sales ratios, the proportion of R&D personnel to total employment, and the proportion of professional R&D personnel to total employment; and three measures of human capital: the ratio of workers with postsecondary education to total employment, the ratio of knowledge workers (occupations in the natural sciences, engineering and mathematics, education, management and administration, social sciences, law and jurisprudence, medicine and health, and writing) to total employment, and the ratio of the number of employed scientists and engineers to total employment (Baldwin and Johnson 1999, 21). Knowledge-based industries are those that fall in the top third on the basis of two of the R&D measures *and* two of the human-capital indices.

2 Other definitions, which include workplaces that *use* knowledge-based technologies, would lead to greater estimates of the size of the knowledge-based economy.

3 A recent *Perspectives* article (Bowlby and Langlois 2002) showed that the ICT sector grew much faster than the whole economy from 1997 to 2000. As a result, the sector accounted

for 7% of Canada's GDP in 2000, up from 4% in 1996. However, the output of the ICT sector plummeted in 2001 because of a sharp decline in the manufacturing component of ICT.

4 Professional and other services comprise transportation, warehousing and wholesale trade; information and cultural industries; finance and insurance; real estate, rental and leasing operations; professional services such as legal, accounting, advertising and design; administration and waste management; educational services; health care and social assistance; and other services.

5 The proportion of part-time employees equals 1% and 4% for knowledge-based workplaces operating in the goods and service sector respectively, compared with 15% in professional and other services, 27% in retail trade and consumer services, and 2% in other goods-producing industries.

6 The same is true in the goods sector. The proportion of workers with a university degree in goods-producing, knowledge-based workplaces is about double that in other goods-producing industries (24% and 11% respectively).

7 This number comes from a regression of the natural logarithm of hourly wages on the following set of explanatory variables: a constant, full-time labour market experience and its squared term, seniority and its squared term, education (3 categories), occupation (47 categories), sex, region (6 categories), long work hours (4 categories), workplace size (4 categories), union status, an indicator for knowledge-based workplaces and interaction terms between this indicator and the education variable. Only the interaction term between postsecondary education and the knowledge-based indicator is statistically significant at the 5% level (two-tailed test). It suggests that the wage gap between knowledge-based workplaces and other workplaces is 12% for workers with some postsecondary education, that is, 4 percentage points higher than for people with other education levels.

8 Work effort may be greater in knowledge-based workplaces since employees in these workplaces are more likely to receive performance-based pay, a compensation scheme that may be associated with greater work effort. As well, workers in knowledge-based workplaces are more likely to participate in self-directed workgroups, a factor that is associated with higher wages after worker characteristics are controlled for.

9 Employees in service-producing, knowledge-based workplaces had lower pension coverage than their counterparts in goods-producing, knowledge-based workplaces, but were much more likely to have employee stock options.

10 Furthermore, 15% of knowledge-based workplaces had profit-sharing plans, compared with only 7% of workplaces in other industries.

11 Workers in the goods-producing, knowledge-based sector may be more likely to report being undereducated as concerns the complexity of the product, reading technical specifications, and interacting with professional team members.

12 It may also be difficult for introverted individuals to adapt to personal dynamics, which may have an impact on their productivity within the team environment.

13 Since job rotation is likely to be occasional, it is worth examining what percentage of workers participate at least occasionally (occasionally, frequently or always). When this is done, participation in job rotation programs equals 27% in other goods-producing industries, 22% in consumer services and retail trade, 18% in professional and other services, 24% in goods-producing, knowledge-based industries and 20% in service-producing, knowledge-based industries. Using this measure, participation in job rotation programs is not necessarily more frequent in knowledge-based industries than in other industries.

14 Caution must be exercised in interpreting these numbers since Leckie et al. (2001, 51) showed that most workers who reported being in teams or in job rotation were in workplaces *not* having teams or job rotation programs. For instance, only 21% of workplaces in knowledge-based industries reported having self-directed workgroups compared with 10% in other industries. One interpretation is that workers may report working in teams when the level of interaction in their job is higher than what they perceive to be normal, regardless of whether the job is associated with *formally* established programs. In contrast, employers may report having teams only if they have formally established teamwork.

15 Standard process means a written report, private meeting with the supervisor, or a standard report.

16 The question asked is: "Considering the duties and responsibilities of this job, how satisfied are you with the pay and benefits you receive? Would you say that you are: very satisfied, satisfied, dissatisfied, or very dissatisfied?"

17 The CT sector comprises 12 NAICS industries: commercial and service industry machinery (3333), computer and peripheral equipment (3341), communications equipment (3342), audio and video equipment (3343), semiconductor and other electronic components (3344), navigational, measuring, medical and control instruments (3345), computer and communications equipment and supplies wholesaler-distributors (4173), software publishers (5112), telecommunications (5133), data processing (5142), computer systems design and related services (5415), electronic and precision equipment repair and maintenance (8112).

18 The increase in average seniority in the CT sector from 73 to 87 months between March 2001 and March 2002 supports this contention.

19 The natural logarithm of hourly wages was regressed on the following set of explanatory variables: a constant, age and its squared term, seniority and its squared term, education (6 categories), occupation (47 categories), gender, part-time status, union status, province, and an indicator for the CT sector.

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Appendix A: Knowledge-based industries

- 221111 Hydro-electric power generation
- 221112 Fossil-fuel electric power generation
- 221113 Nuclear electric power generation
- 221119 Other electric power generation
- 221121 Electric bulk power transmission and control
- 221122 Electric power distribution

- 324110 Petroleum refineries
- 324121 Asphalt paving mixture and block manufacturing
- 324190 Other petroleum and coal products manufacturing
- 325110 Petrochemical manufacturing
- 325120 Industrial gas manufacturing
- 325130 Synthetic dye and pigment manufacturing
- 325181 Alkali and chlorine manufacturing
- 325189 All other basic inorganic chemical manufacturing
- 325190 Other basic organic chemical manufacturing
- 325210 Resin and synthetic rubber manufacturing
- 325313 Chemical fertilizer (except potash) manufacturing
- 325314 Mixed fertilizer manufacturing
- 325320 Pesticide and other agricultural chemical manufacturing
- 325410 Pharmaceutical and medicine manufacturing
- 325520 Adhesive manufacturing
- 325910 Printing ink manufacturing
- 325920 Explosives manufacturing
- 325991 Custom compounding of purchased resins
- 325999 All other miscellaneous chemical product manufacturing

- 332991 Ball and roller bearing manufacturing
- 333110 Agricultural implement manufacturing
- 333120 Construction machinery manufacturing
- 333130 Mining and oil and gas field machinery manufacturing
- 333210 Sawmill and woodworking machinery manufacturing
- 333220 Rubber and plastics industry machinery manufacturing
- 333291 Paper industry machinery manufacturing
- 333299 All other industrial machinery manufacturing
- 333310 Commercial and service industry machinery manufacturing
- 333413 Industrial and commercial fan and blower and air purification equipment manufacturing
- 333416 Heating equipment and commercial refrigeration equipment manufacturing
- 333611 Turbine and turbine generator set unit manufacturing
- 333619 Other engine and power transmission equipment manufacturing
- 333910 Pump and compressor manufacturing
- 333920 Material handling equipment manufacturing
- 333990 All other general-purpose machinery manufacturing
- 334110 Computer and peripheral equipment manufacturing
- 334210 Telephone apparatus manufacturing
- 334220 Radio and television broadcasting and wireless communications equipment manufacturing
- 334290 Other communications equipment manufacturing
- 334310 Audio and video equipment manufacturing
- 334410 Semiconductor and other electronic component manufacturing
- 334511 Navigational and guidance instruments manufacturing

- 334512 Measuring, medical and controlling devices manufacturing
- 335311 Power, distribution and specialty transformers manufacturing
- 335312 Motor and generator manufacturing
- 335315 Switchgear and switchboard, and relay and industrial control apparatus manufacturing
- 335920 Communication and energy wire and cable manufacturing
- 335990 All other electrical equipment and component manufacturing
- 336410 Aerospace product and parts manufacturing

- 486110 Pipeline transportation of crude oil
- 486210 Pipeline transportation of natural gas
- 486910 Pipeline transportation of refined petroleum products
- 486990 All other pipeline transportation

Appendix A: Knowledge-based industries (concluded)

511210 Software publishers
512110 Motion picture and video production
513220 Cable and other program distribution
513310 Wired telecommunications carriers
513320 Wireless telecommunications carriers (except satellite)
513330 Telecommunications resellers
513340 Satellite telecommunications
513390 Other telecommunications
514210 Data processing services

532420 Office machinery and equipment rental and leasing

541310 Architectural services
541320 Landscape architectural services
541330 Engineering services
541340 Drafting services
541360 Geophysical surveying and mapping services
541370 Surveying and mapping (except geophysical) services
541380 Testing laboratories
541510 Computer systems design and related services
541620 Environmental consulting services
541690 Other scientific and technical consulting services
541710 Research and development in the physical, engineering and life sciences

Appendix B: ICT industries

Manufacturing

33331 Commercial and service industry machinery
33411 Computer and peripheral equipment
33421 Telephone apparatus
33422 Radio and television broadcasting and wireless communications equipment
33431 Audio and video equipment
33441 Semiconductor and other electronic components
33451 Navigational, measuring, medical, and control instrumentation
33592 Communication and energy wire and cable

Services

51121 Software publishers
51322 Cable and other program distribution
5133 Telecommunication services
51419 Other information services
51421 Data processing services
54151 Computer systems design and related services
81121 Electronic and precision equipment repair and maintenance
41731 Computer, computer peripheral and prepackaged software wholesaling
41732 Electronic components, navigational and communications equipment and supplies wholesaling
41791 Office and store machinery and equipment wholesaling
53242 Office machinery and equipment rental and leasing
