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Abstract

This article assesses the changes over the past two decades in the occupational skill level of employment in Canada, with a focus on the role of immigration in the changing occupational structure. From 2001 to 2021, employment in jobs requiring professional and technical skills expanded the most. Canadian-born workers accounted for about half of this employment expansion, while immigrant workers and temporary foreign workers (TFWs) contributed to the other half. Over the same period, employment in lower-skilled occupations contracted by 500,000. As Canadian-born workers moved out of this skill level in a substantial way, immigrant workers and TFWs were increasingly employed in these lower-skilled jobs. Hence, to some extent, immigrant workers and TFWs backfilled Canadian-born workers as they moved away from lower-skilled jobs. A similar pattern was observed for labourers—the lowest skill-level group. The number of Canadian-born workers employed as labourers declined, while the corresponding number among immigrant workers and TFWs increased. Possible implications of these findings for the economic outcomes of immigrant workers are discussed.

Keywords: technological change, occupation skills, immigration, temporary foreign workers

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Introduction

The research literature generally supports the idea that technological change has favoured the demand for workers in occupations requiring higher levels of education and skills and negatively affected employment in occupations requiring lower skill levels (Brynjolfsson & McAfee, 2014; Gibbs & Bazylik, 2022). Most Western countries have experienced occupational employment patterns that are consistent with this notion of the effect of technological change on employment (e.g., Acemoglu & Autor, 2011; Hardy, Keister & Lewandowski, 2018). The educational attainment of the workforce can also influence the types of occupations produced by an economy. Beaudry and Green (2003) suggest that increasing educational attainment of the labour force generates increased demand for highly skilled labour and more jobs at the top end of the skill distribution.

In Canada, research has identified a gradual shift in the occupational structure from the mid-1980s to the mid-2010s. There was a notable increase in the proportion of workers in managerial, professional, technical and service occupations. Conversely, there was a corresponding decrease in the share of those employed in lower-skilled occupations, such as production, craft, repair and operative occupations and sales, clerical and administrative support jobs (Frank, Yang & Frenette, 2021). Furthermore, a similar shift in occupational distribution occurred at an accelerated pace from 2019 to 2022 (Frenette, 2023).

The objective of this article is to situate immigrant workers within the evolving occupational landscape of Canada. On average, immigrant workers possess significantly higher levels of education than Canadian-born workers, and they have played a substantial role in elevating the educational attainment of the entire labour force. However, immigrant workers frequently encounter challenges in fully leveraging their educational credentials, leading to a higher incidence of overeducation when compared with Canadian-born workers (Hou, Lu & Schimmele, 2021). This outcome is particularly evident among immigrant workers who acquired their university education in a developing country (Boyd & Tian, 2018; Picot & Hou, 2019). Furthermore, immigrant workers in the family class and refugees tend to have lower levels of education than economic immigrants. Many of these immigrant workers tend to be in low-skilled jobs (Picot, Hou & Crossman, 2023). Hence, it is unclear how immigration has contributed to occupational changes in Canada. It may have supported the expansion of higher-skilled occupations. Immigrant workers may also have replaced many Canadian-born workers in lower-skilled occupations. Information on the role of immigration in the evolving occupational structure would be useful in immigrant selection. This paper presents a new analysis using census data from 2001 to 2021.

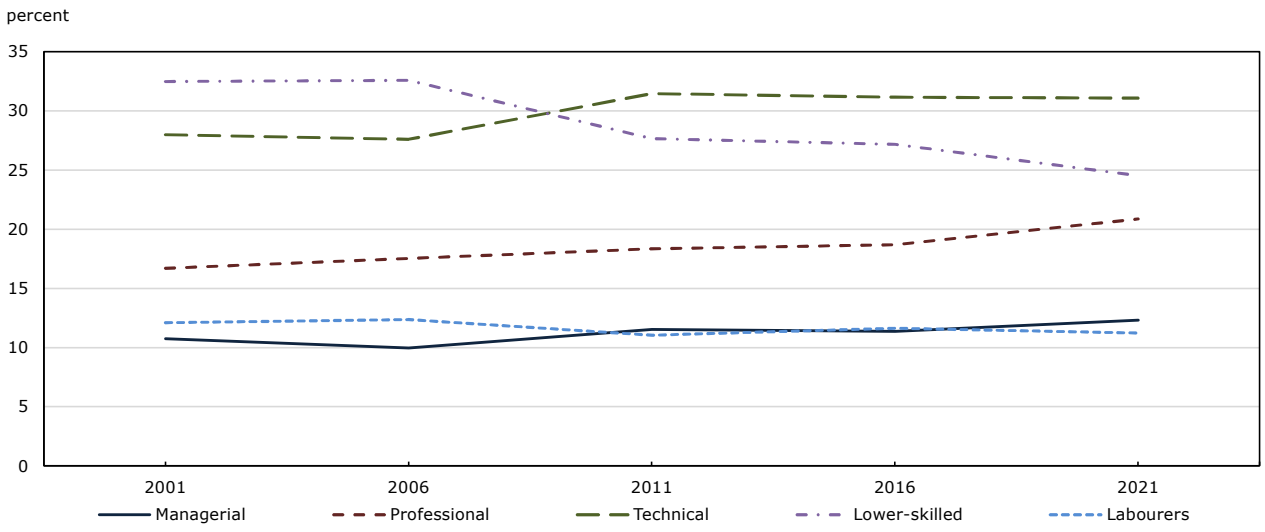
The changing occupational distribution in Canada, 2001 to 2021

This section provides an overview of the changes over the past two decades in the types of jobs—defined in terms of occupational skill level—generated by the Canadian economy. The data are from the five censuses between 2001 and 2021. The five skill levels established in the National Occupational Classification (NOC) are used in this analysis. These skill levels are determined by the education and training required for an occupation, as well as the tasks involved. The five skill levels in the 2016 NOC (0, A, B, C and D) are as follows (Statistics Canada, 2016):

- skill level 0—managerial jobs (management jobs, such as financial managers, engineering managers, and restaurant and food service managers)
- skill level A—professional jobs (professional jobs that usually require a bachelor's degree or higher)
- skill level B—technical jobs (technical jobs and skilled trades that usually require a postsecondary diploma below a bachelor's degree or training as an apprentice, such as technicians in health occupations, chefs and electricians)
- skill level C—lower-skilled jobs (intermediate jobs that usually require a high school education or job-specific training, such as nurse aides, transport truck drivers, food and beverage servers, and retail salespersons)
- skill level D—labourers (labour jobs that usually provide on-the-job training, such as fruit pickers, cleaning staff and automobile assemblers).

Over a 20-year period, Canada experienced a significant shift in employment by occupation towards professional occupations and away from lower-skilled occupations (Chart 1 and Table 1). In 2001, the lower-skilled group was the largest in the labour force, accounting for one-third of all workers. By 2021, the share had fallen to one-quarter. While the share in lower-skilled occupations fell 8 percentage points, the share in professional occupations increased 4 percentage points, from 16.7% to 20.9%. In 2001, there was a gap of 16 percentage points between employment shares in lower-skilled and professional occupations. By 2021, this had fallen to 4 percentage points. The share of employment in technical and managerial occupations also increased over the 20-year period. The proportion of employment in the lowest-skilled group, general labourers, changed relatively little over this period.

Chart 1
Percent distribution of employment by occupational skill level, 2001 to 2021



Sources: Statistics Canada, 2001, 2006, 2016 and 2021 censuses of population and 2011 National Household Survey.

Table 1
Distribution of occupational skills among employed workers by immigrant status, 2001 to 2021

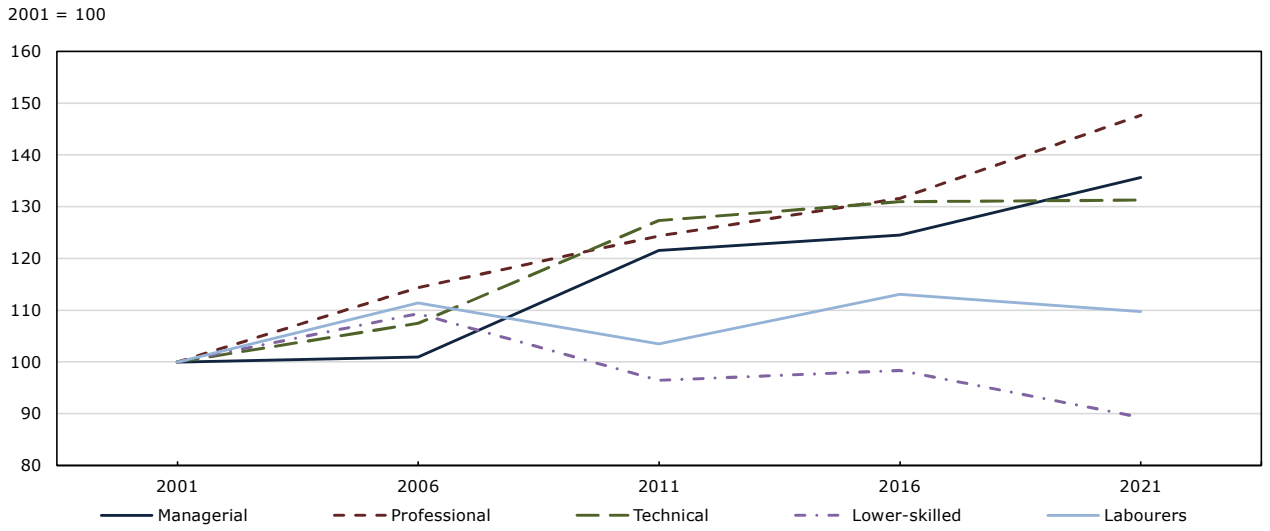
	2001	2006	2011	2016	2021	2001	2006	2011	2016	2021
	number					percent				
All workers										
Managerial	1,573,300	1,588,500	1,911,900	1,958,800	2,134,700	10.7	10.0	11.5	11.4	12.3
Professional	2,446,200	2,797,600	3,042,200	3,220,000	3,612,500	16.7	17.5	18.3	18.7	20.9
Technical	4,098,400	4,404,400	5,219,400	5,368,200	5,381,800	28.0	27.6	31.5	31.2	31.1
Lower-skilled	4,757,100	5,201,600	4,588,900	4,679,800	4,248,200	32.5	32.6	27.7	27.2	24.5
Labourers	1,771,500	1,973,500	1,832,600	2,003,300	1,944,600	12.1	12.4	11.0	11.6	11.2
Total	14,646,500	15,965,600	16,595,000	17,230,000	17,321,700	100	100	100	100	100
Canadian-born workers										
Managerial	1,225,900	1,230,600	1,491,700	1,499,600	1,580,500	10.5	9.9	11.7	11.6	12.8
Professional	1,885,000	2,105,900	2,238,300	2,317,600	2,456,500	16.2	16.9	17.5	18.0	19.9
Technical	3,346,000	3,562,600	4,150,000	4,161,200	4,016,200	28.7	28.6	32.5	32.3	32.5
Lower-skilled	3,795,900	4,049,700	3,503,600	3,444,200	2,933,400	32.5	32.5	27.4	26.7	23.8
Labourers	1,414,300	1,531,600	1,390,900	1,461,200	1,358,800	12.1	12.3	10.9	11.3	11.0
Total	11,667,100	12,480,400	12,774,500	12,883,700	12,345,400	100	100	100	100	100
Immigrant workers										
Managerial	340,400	348,900	405,700	439,800	515,800	11.7	10.3	11.1	10.7	11.7
Professional	543,800	660,700	759,800	846,500	1,046,200	18.7	19.6	20.8	20.6	23.7
Technical	740,300	823,400	1,027,400	1,145,700	1,214,700	25.4	24.4	28.2	27.9	27.5
Lower-skilled	940,000	1,116,200	1,034,700	1,169,700	1,153,900	32.3	33.0	28.4	28.5	26.1
Labourers	348,400	428,700	418,800	505,800	492,300	12.0	12.7	11.5	12.3	11.1
Total	2,912,900	3,377,900	3,646,300	4,107,500	4,422,900	100	100	100	100	100
Temporary foreign workers										
Managerial	7,000	9,000	14,500	19,400	38,400	10.6	8.4	8.3	8.1	6.9
Professional	17,400	31,000	44,100	55,900	109,700	26.1	28.9	25.3	23.4	19.8
Technical	12,100	18,400	42,100	61,300	150,900	18.2	17.1	24.2	25.7	27.3
Lower-skilled	21,200	35,700	50,600	65,900	160,900	31.9	33.3	29.1	27.6	29.1
Labourers	8,800	13,200	23,000	36,300	93,500	13.2	12.3	13.2	15.2	16.9
Total	66,600	107,300	174,200	238,800	553,400	100	100	100	100	100

Note: All counts are rounded to the nearest 100.

Sources: Statistics Canada, 2001, 2006, 2016 and 2021 censuses of population and 2011 National Household Survey.

Taking a closer look at employment growth since 2001 provides an alternative viewpoint (Chart 2). Over the 20-year period, total employment increased by 18%. Professional occupations expanded the fastest, with a 48% surge. Managerial jobs saw the second-highest growth rate (36%), followed by employment in technical occupations (31%). In contrast, employment in lower-skilled jobs fell 11%. This pattern is consistent with the results of a recent Canadian study based on the Labour Force Survey (Frenette, 2023) and results from other developed countries (Gibbs & Bazylik, 2022; Heath, 2020).

Chart 2
Growth in employment by occupational skill level, 2001 to 2021



Sources: Statistics Canada, 2001, 2006, 2016 and 2021 censuses of population and 2011 National Household Survey.

Changing occupational distribution of immigrant and Canadian-born workers

In 2021, compared with the Canadian-born population, immigrants[1] tended to be more concentrated in professional and lower-skilled occupations (Table 1). The skill levels that had higher shares of Canadian-born workers than immigrant workers included managerial and technical occupations. This was particularly true for the latter, which attracted one-third of Canadian-born workers (32.5%), compared with just over one-quarter of immigrant workers (27.2%). There was little difference between immigrant and Canadian-born workers in the proportion who were labourers (11%). Higher shares of temporary foreign workers (TFWs) worked in lower-skilled occupations and as labourers, compared with Canadian-born and immigrant workers.

In terms of the change in occupational distributions over time, the patterns differed by immigrant status. Over the 20-year period, the share of employment in professional jobs increased faster among immigrant than Canadian-born workers[2] (Table 1). However, for technical jobs, the share increased more among Canadian-born workers.[3] Thus, Canadian-born and immigrant workers responded to the expansion of professional jobs, but the increase in technical jobs was primarily registered among Canadian-born workers. Among TFWs, their shares in managerial and professional occupations decreased, but their shares increased considerably in technical occupations.

Lower-skilled jobs became less prominent over the study period for all three groups. The declining share in these jobs was greater among Canadian-born workers (8.7 percentage points) than among immigrant workers (6.2 percentage points) and TFWs (2.8 percentage points). The share of labourers declined slightly, by about 1 percentage point, among Canadian-born and immigrant workers but increased 3.7 percentage points among TFWs.

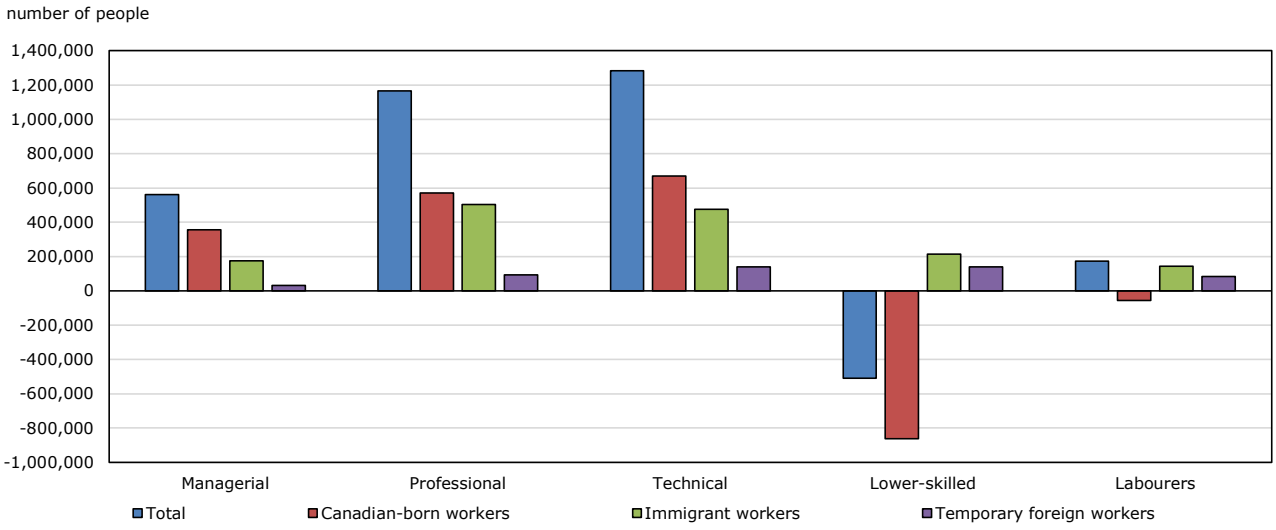
1. The term “immigrants” refers to people who are, or have ever been, landed immigrants or permanent residents.
2. The share of employment in professional jobs increased 5.0 percentage points among immigrant workers and 3.8 percentage points among Canadian-born workers.
3. The share increased 3.8 percentage points among Canadian-born workers and 2.1 percentage points among immigrant workers.

Overall, Canadian-born workers reduced their dependence on lower-skilled jobs to a greater extent than immigrant workers or TFWs. Immigrant and Canadian-born workers increased their likelihood of being in higher-skilled jobs, but with notable differences between the two groups. Immigrant workers moved primarily into more professional jobs, with little change in their tendency to be in managerial or technical jobs. Among Canadian-born workers, the employment share increased in all three job types—professional, managerial and technical. Among TFWs, their shares increased in technical occupations and as labourers, but decreased in managerial, professional and lower-skilled occupations.

The contribution of immigrant and Canadian-born workers to the expansion of low- and high-skilled jobs

This section considers the change in the absolute number of jobs at each skill level by immigrant status. There was significant variation by skill level in the expansion of employment over the last 20 years. While the highest growth rate in Canada from 2001 to 2021 was at the professional skill level, the largest number of jobs created was at the technical level, followed by the professional level. The number of lower-skilled jobs declined significantly, and there was only a small increase in the number of labourers (Chart 3).

Chart 3
Change in employment by skill level and immigrant status, Canada, 2001 to 2021



Sources: Statistics Canada, 2001, 2006, 2016 and 2021 censuses of population and 2011 National Household Survey.

At the professional skill level, about half of the employment expansion was from Canadian-born workers (49%), and the other half was from immigrant workers (43%) and TFWs (8%) taken together (Chart 3). The story was similar at the technical skill level. Together, immigrant workers (37%) and TFWs (11%) filled about half of the created jobs.

The story for lower-skilled occupations was very different. The number of jobs at this skill level declined by 500,000, at least in part because of the effect of technological change. In this case, Canadian-born workers moved away from jobs at this skill level in a major way; their employment declined by 860,000. To some extent, immigrant workers and TFWs backfilled Canadian-born workers at this skill level.

Although overall employment at this level fell, employment at this level increased by 213,000 for immigrant workers and 139,000 for TFWs. The story was similar for labourers—the lowest skill level. While the overall number of labourers increased marginally (173,000), again Canadian-born workers tended to exit these jobs, with their employment at this skill level declining by 55,000. Immigrant workers and TFWs, on the other hand, increased their contribution to the number of labourers, with employment increasing by 143,000 and 84,000 workers, respectively.

The above analysis applies to all employment—part-time and full-time. Almost one-third (31%) of the employment expansion from 2001 to 2021 in Canada was in part-time employment. The growth in part-time jobs was particularly evident among labourers, where 86% of the small expansion consisted of part-time jobs. Furthermore, 83% of the expansion in part-time employment was met by immigrant workers (54%) and TFWs (29%). Canadian-born workers played little role in filling these part-time jobs.

Part-time employment also constituted a significant part of the contribution of immigrant workers at the lower-skilled level. While full-time lower-skilled employment declined substantially (544,000 jobs), part-time employment increased marginally (35,000). Employers largely turned away from full-time lower-skilled employment. However, part-time employment did not decline. In this environment, Canadian-born workers moved away from filling part-time jobs at this level. While part-time employment levels increased by 113,000 for immigrant workers and 49,000 for TFWs, part-time employment levels declined by 126,000 for Canadian-born workers. Collectively, immigrant workers and TFWs more than offset Canadian-born workers' movement away from part-time lower-skilled employment.

Conclusion and discussion

This article examined changes in occupational skill levels in Canada from 2001 to 2021 and the role immigration played in these changes. Occupations at the professional skill level showed the fastest employment growth in Canada, with occupations at the managerial and technical skill levels close behind. Employment in lower-skilled occupations that required only high school graduation or on-the-job training declined significantly, while jobs at the lowest skill level—labourers who require only some on-the-job training—increased marginally. These patterns are consistent with the effects of technological change and the employment trends observed in many other Western countries.

Immigrant and Canadian-born workers played different roles in the changing pattern of occupational skill levels. Over the 20-year period, Canadian-born workers moved out of lower-skilled jobs in a significant way, while immigrant workers' dependency on lower-skilled jobs decreased by a much lesser extent. Immigrant workers were more likely than Canadian-born workers to move into professional jobs. However, their tendency to be in managerial or technical jobs was little changed, unlike the tendency for workers born in Canada.

The absolute change in employment provides an alternative perspective. From 2001 to 2021, employment expanded the most in jobs requiring professional and technical skill levels. Canadian-born workers accounted for about half of this employment expansion. The other half was from immigrant workers (who accounted for 43% of the expansion in professional occupations and 37% of that in technical occupations) and TFWs (who accounted for 8% and 11%, respectively). Thus, together, immigrant workers and TFWs played a roughly equal role as Canadian-born workers in filling the new higher skill-level jobs created by technological change and other socioeconomic forces. To put these results in context, over the 20-year period, immigrant workers accounted for 57% of the total employment growth, and TFWs accounted for 18%. Therefore, immigrant workers and TFWs contributed relatively less to the growth in professional and technical jobs than to the growth in total employment.

The story was quite different at the lower skill levels. From 2001 to 2021, employment in lower-skilled occupations contracted by 500,000. As Canadian-born workers moved out of this skill level in a substantial way, reducing their employment by 860,000, together, immigrant workers and TFWs increased their employment in these lower-skilled jobs by 360,000. Hence, to some extent, immigrant workers and TFWs backfilled Canadian-born workers as they moved away from lower-skilled jobs. This pattern was similar for labourers—the lowest skill-level group. The number of Canadian-born labourers declined, while the employment contribution by immigrant labourers and TFWs increased.

Overall, the results of this study indicate that the role of immigrant workers in low-skilled occupations has increased. Together with TFWs, they filled some of the low-skilled jobs that previously would have been occupied by Canadian-born workers. Whether employers of low-skilled jobs would have turned to technological solutions to an even greater extent had fewer immigrant workers and TFWs been available is unknown. Interestingly, similar results were found in the United States. Basso, Pen and Rahma (2020) show that computerization in the United States was associated with increased immigrant employment in manual and service occupations, while the native-born population experienced a decline in routine jobs and an increase in higher-skilled jobs.

If immigrant workers continue to be employed in large and increasing numbers in lower-skilled (and lower-wage) occupations that are experiencing declining employment levels, their future economic prospects may be negatively affected as such jobs continue to disappear. If this trend continues, it will also affect immigrant workers' contribution to economic growth. According to the research literature, it is the expansion of sectors with predominantly high-skilled occupations, and not the expansion of sectors consisting predominantly of low-skilled occupations, that results in increased gross domestic product (GDP) per capita (Buera, Kaboski, & Rogerson, 2015). Increasing the employment share of immigrant workers in lower-skilled sectors and occupations would reduce their contribution to GDP per capita.

This study also found that the role of TFWs was not insignificant and has been growing. Their occupational distribution showed a decrease in managerial and professional occupations and an increase in technical jobs. However, their contributions to employment growth tended to be largest in lower-skilled occupations and as labourers.

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