The Changing Pace of Labour Reallocation in Canada: Causes and Consequences

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- *The number of job gains and losses across firms in Canada each year is roughly one-fifth of the total number of jobs. The vast majority of this reallocation occurs* within *sectors (industries) rather than* across *sectors.*

- *The appreciation of the Canadian dollar and rising commodity prices led to above-average reallocation of labour across sectors over the 2005–08 period. The impact of this reallocation on productivity has been minor, however.*

- *Labour reallocation within sectors has been strongly related to productivity growth in Canada. Defining the key drivers of this type of reallocation remains an open question, one made more pertinent by the higher rates of reallocation and productivity growth in the United States than in Canada.*

Reallocation of resources is a widespread, constant phenomenon in a competitive economy characterized by substantial firm heterogeneity and buffeted by shocks at the firm, sector, and economy levels. To mention only two examples, soaring commodity prices and the sharp appreciation of the Canadian dollar caused labour to be reallocated during the 2002–08 period from most manufacturing industries to the extractive sector and to sectors producing non-tradables (Dupuis and Marcil 2008). The deregulation of the U.S. telecommunications sector triggered a marked increase in resource reallocation, with many new plants and firms entering this sector, inefficient ones exiting it, and market shares changing considerably (Bartelsman and Doms 2000).

Reallocation affects output and market shares as well as the various inputs in the production process—labour, capital, and materials. A key question for research has been whether, how, and to what extent labour reallocation has influenced the productivity performance of sectors and economies—in addition to the more direct impacts of capital deepening, innovation, and human capital development. With respect to output, Baldwin and Gu (2006) find that shifts in market shares across firms have contributed to about 70 per cent of the overall productivity growth in Canadian manufacturing over the 1979–99 period. With respect to capital, Cao (2008) estimates that an increased flow of productive capital across firms through changes in ownership could have significantly boosted aggregate U.S. labour productivity in the mid-1980s. With respect to materials, Bosworth and Triplett (2007) calculate that intermediate input reallocations across sectors (industries) would have raised aggregate productivity growth in the United States in the 2000–05 period after having depressed it considerably in the 1995–2000 period.

As for labour reallocation, it has received much more attention at the aggregate level (i.e., shifts across sectors) than at the sectoral level (i.e., shifts across firms or plants). Yet the latter has considerably more potential than the former to affect aggregate economic performance. Indeed, decompositions of the economy-wide growth of labour productivity into i) within-sector productivity gains, and ii) gains owing to the reallocation of labour to sectors with higher productivity levels or growth, show that the effect of labour reallocation across sectors is minor and that gains largely originate within sectors. To the extent that productivity gains arise from labour reallocation across highly heterogeneous firms, such reallocation would be a significant contributor to aggregate productivity growth. One aim of this article is to report on recent research that attempts to shed light on this issue for Canada. Another aim is to report on recent results concerning the drivers of labour reallocation at the firm or plant level. If reallocation across firms matters for aggregate productivity growth—considering that information on this reallocation is available only after long lags—knowing how the drivers of this reallocation have recently evolved would inform judgment on its potential contribution to recent aggregate productivity growth.

The article is organized as follows. It first compares the pace of labour reallocation in Canada in recent periods to that experienced in the past. It looks not only at reallocation across sectors, but also at reallocation across firms, which dwarfs the movements across sectors. Second, it discusses the factors that may cause changes in the amount of reallocation across sectors and firms, and assesses the role of fluctuations in commodity prices and the exchange rate in accounting for changes in the pace of labour reallocation in Canada. Finally, since it is possible that the pace of reallocation could influence the pace of efficiency gains, the last section discusses the relationship between reallocation and productivity and presents some new Canadian evidence on the magnitude of this relationship.

Employment Reallocation in Canada

Reallocation across sectors

This section documents the evolution of sectoral reallocation in Canada over the 1987–2008 period. One common measure of the amount of employment reallocation across sectors is Lilien's sectoral shift measure (1982). Lilien's measure is the weighted average of squared deviations of sectoral employment growth rates from the aggregate employment growth rate,

$$\sigma_t = \left[\sum_i^N \frac{E_{it}}{E_t} \left(\Delta \ln E_{it} - \Delta \ln E_t \right)^2 \right]^{0.5} , \quad (1)$$

where E_{it} is the employment level of industry i at time t, E_t is total employment in the economy at time t, and N is the number of industries. The measure sums to zero when all industries are growing at the same rate and gets larger as the employment growth rates of the industries become more varied. Alternatively, $\Delta \ln E_{it} - \Delta \ln E_t$ can be interpreted as the change in industry i's employment share, so that Lilien's measure increases when changes in the employment shares become more varied across industries.

Cao and Leung (2009) calculate this measure using sectoral employment from the Labour Force Survey (LFS) for the 18 sectors of the total economy over the 1987–2008 period.[1] They find that the pace of reallocation was above average for the years 2005–08 (Chart 1). Negative employment growth in manufacturing contributed significantly to the elevated level of reallocation in each of those years; on average, it accounted for 36 per cent of total reallocation. On the other hand, strong growth in construction accounted for 13 per cent of the total dispersion over the whole period; above-average growth in the extractive sector contributed in 2005 and 2006; and a pickup in employment growth in public administration played a major role in 2008. These findings are consistent with the notion that the appreciation of the Canadian dollar and the rise in commodity prices in the 2005–08 period increased foreign competition and costs for the manufacturing sector; led directly to large employment gains in the extractive sector; and fuelled an improvement in the terms of trade and real domestic income that caused employment in certain non-tradable sectors, such as construction, to surge.

As rapid as the pace of sectoral reallocation has been in recent years, there have been years in which it has been almost as high, or higher. Chart 1 identifies three such years in the past two decades: 1991, 1999, and

1 These sectors are agriculture, forestry, fishing, and hunting; mining, oil and gas extraction; utilities; construction; manufacturing; wholesale trade; retail trade; transportation and warehousing; information and culture; finance, insurance, and real estate; professional, scientific, and technical services; management of companies and enterprises, administrative and support, waste management and remediation services; educational services; health care and social assistance; arts, entertainment, and recreation; accommodation and food services; other services; and public administration.

2001.[2] Commodity prices likely played a role in the increased pace of reallocation in 1999, but not in 1991 or 2001. The negative employment growth in the extractive and agriculture, forestry, fishing and hunting sectors, which accounted for roughly one-third of the dispersion in employment growth in that year, may be linked to weak commodity prices. Most of the dispersion in 2001 can be traced to the large drop in employment in agriculture, forestry, and fishing, which is likely related to the Canada-wide drought in that year. The increase in reallocation in 1991 can be attributed to the recession and the sharp decline in employment in both manufacturing and construction. The high level of dispersion in employment growth in 1991 is a prime example of the sensitivity of Lilien's measure to fluctuations in the business cycle, first pointed out by Abraham and Katz (1986).[3]

Chart 1: Lilien's Measure of Employment Reallocation across Sectors in Canada, 1988–2008

— 1988–2008 average
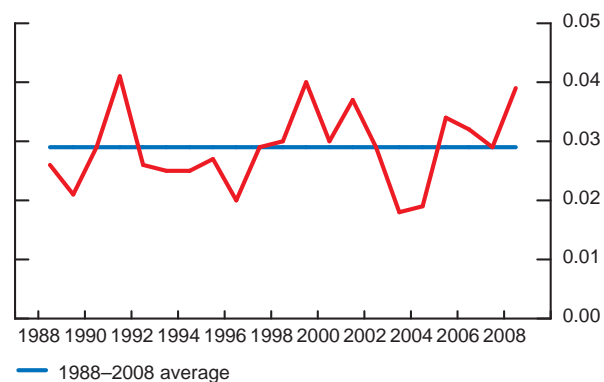
Source: Authors' calculations

Reallocation across firms

Firms vary greatly in their characteristics, even within a narrowly defined sector. Some firms—perhaps because of their size, the skill of their management, their production technology, the particular markets they serve, the reputation of their product, the special business relationships they have with suppliers and
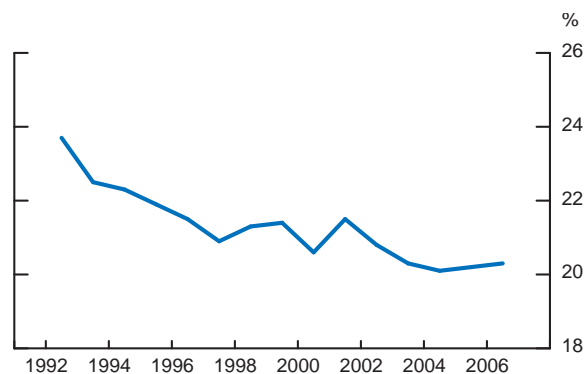
credit suppliers, or their financial position—can deal better than others with shocks, such as a rapid appreciation of the Canadian dollar vis-à-vis the U.S. dollar. Thus, while sectoral or aggregate employment may be falling, employment at a particular firm may be expanding. This section documents the amount of this reallocation of employment across firms.

The net change in total employment equals the sum of new employment created across all firms that had increasing employment minus the sum of employment destroyed in all firms that had decreasing employment. "Total job reallocation" (as it is termed in the literature) is the sum of new employment created in all firms that had increasing employment plus the sum of employment destroyed in all firms that had decreasing employment (see Box). The job reallocation rate is total job reallocation expressed as a fraction of the stock of employment.

Cao and Leung (2009) calculate job reallocation rates using Canadian administrative data for the years 1992–2006 on firms with employees in the business sector.[4] Compared with the measure of employment reallocation across sectors (Chart 1), the job reallocation rate does not exhibit much variability (Chart 2). It appears, however, to be declining slightly over time.[5] This suggests that the amount of reallocation across firms is less likely to be driven by movements in the exchange rate and commodity prices, and more likely to be the result of structural/institutional factors such as deregulation, trade liberalization, and population aging.

Chart 2: Job Reallocation Rate within the Business Sector, 1992–2006

Source: Authors' calculations

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2 Cao and Leung (2009) also use data from the Canadian Productivity Accounts to calculate a measure of the dispersion of growth rates of hours worked for 1962–2004 at a similar level of intersectoral disaggregation. They find that the peaks in intersectoral reallocation in the past two decades are comparable in size to those of the 1960s, 1970s, and 1980s, and that there is no long-term trend in the pace of intersectoral reallocation. However, using historical statistics, Sargent (2000) shows that there were much higher levels of reallocation in the 1921–60 period than in the post-1960 period.

3 The sensitivity of Lilien's measure to the business cycle diminishes its usefulness as a measure of permanent structural change because much of the decline in manufacturing and construction during a recession is often transitory and likely to reverse itself somewhat in subsequent years. Therefore, in this article, Lilien's measure is used in reference to the dispersion of employment growth or the pace of sectoral reallocation and not to the pace of structural change.

4 Cao and Leung (2009) use Statistics Canada's LEAP (Longitudinal Employment Analyses Program) data, which provide payroll and employment data for all firms with employees in the Canadian economy. The business sector is defined as all sectors less public administration, private households, and the public portions of education and health care.

5 Using firm-level data for the United States, Davis et al. (2008) show that, since the early 1990s, job reallocation rates have declined in the U.S. non-farm private sector.

Job Reallocation across Firms: Concepts and Definitions

The concept of job reallocation presented in this article is the same one used by the pioneers of the research in this area—Davis, Haltiwanger, and Schuh (1996). Let E_{ft} be the number of workers in firm f at time t and let $Z_t = 0.5(E_t + E_{t-1})$ be the two-year average of total employment. The *rate of job creation* is the sum of employment increases in all firms that had increasing employment divided by total employment:

$$c_t = \frac{\sum_{f \in S^+} \Delta E_{ft}}{Z_t}, \qquad (1)$$

where S^+ is the set of firms that had increasing employment. The *rate of job destruction* is the sum of employment decreases in firms that had decreased employment divided by total employment:

$$d_t = \frac{\sum_{f \in S^-} |\Delta E_{ft}|}{Z_t}, \qquad (2)$$

where S^- is the set of firms that had decreasing employment. Whereas the employment growth rate is $c_t - d_t$, the *job reallocation rate*, r_t, is $c_t + d_t$.

The job reallocation rate for a particular sector, r_{it}, is calculated in the same way, except that the sum includes only the firms in that sector. Furthermore, the weighted average of the sectoral job reallocation rates equals the aggregate job reallocation rate:

$$r_t = \sum_i \left(\frac{Z_{it}}{Z_t} \right) r_{it}, \qquad (3)$$

where Z_{it} is the 2-year average of industry i's employment.

The difference between the job reallocation rate and the employment growth rate is called the *excess job reallocation rate*, which is the amount of reallocation over and above the amount necessary to generate the net change in employment. For example, to have a net change of 1 in employment, all that is necessary is to have one firm creating one job, but that same net change in employment may have been the result of one firm creating 100 jobs and another firm destroying 99.

While there is not much variability in the job reallocation rates across time, there is substantial variability across sectors (industries) (Chart 3). Each bar in Chart 3 identifies the average job reallocation rate over the 1992–2006 period for the business sector and the 17 subsectors (based on the LEAP data). On average, the job reallocation rate for the business sector is 21 per cent—indicating that approximately one in five jobs in the economy is either created or destroyed each year. The rates for construction, agriculture (including forestry, fishing, and hunting), and professional services are much higher than the rate for the entire business sector. In these sectors, nearly one in three jobs is created or destroyed each year. At the other end of the spectrum is health care, where less than one job in ten is turned over each year.

The job reallocation rate for the business sector is 21 per cent—indicating that approximately one in five jobs in the economy is either created or destroyed each year.

Chart 3 also breaks down the job reallocation rate for each sector into two parts: the absolute value of the sectoral employment growth rate and the "excess" job reallocation rate, which is the part of the overall rate that is over and above the amount necessary to bring about the net changes in employment. According to Chart 3, net changes in employment account for only a small fraction of the job reallocation rate in each sector. This indicates that the net employment changes across sectors discussed in the previous section represent only a small fraction of the reallocation of labour in the economy.

Chart 3: Average Job Reallocation Rate, by Sector, 1992–2006
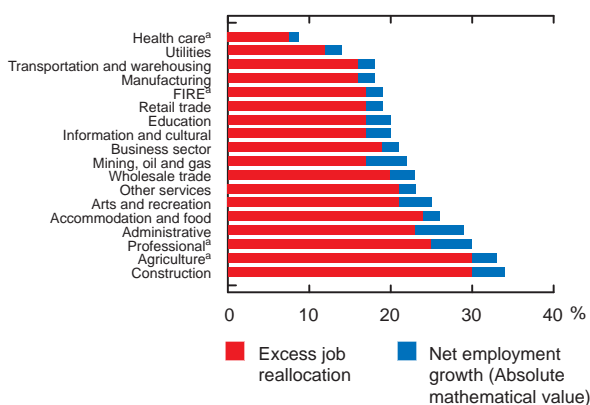
a. Health care includes social assistance; FIRE = finance, insurance, and real estate; Professional includes scientific and technical; Agriculture includes forestry, fishing and hunting.

Source: Authors' calculations

Drivers of Reallocation

The evidence presented in the previous section suggests that the surge in commodity prices and the appreciation of the Canadian dollar were major factors in the increased reallocation of labour across sectors over the 2005–08 period. In this section, econometric evidence shows that this is indeed the case. The section also discusses more generally the factors that may cause the amount of reallocation across sectors and within sectors (across firms) to change over time.

Sources of reallocation across sectors

Changes in demand for labour across sectors are fundamentally driven by changes in the demand for the goods and services that each sector produces and the production technology each sector employs. Thus, as income increases with economic growth, the demand for goods and services that are relatively income elastic will tend to rise relative to other goods

and services, and the share of employment in the sectors that produce them will increase. As well, the evolution of technology generally favours the goods-producing sectors over the services sectors over time; both labour productivity and multi-factor productivity have risen more quickly in goods than in services.[6] As a result, less labour is needed in the goods sector than in the services sector to produce the same quantity of output. The long-run decline of the employment shares of manufacturing and agriculture owes much to this biased technological change. Other factors affecting supply are more transitory but can nevertheless have an impact on measures of reallocation. The effect of the cross-Canada drought in 2001 is a case in point.

As noted earlier, shifts in the composition of demand across sectors can be related to the business cycle. Abraham and Katz (1986) noted that labour in certain goods-producing sectors, particularly manufacturing and construction, declines faster during a recession than in service-producing sectors. Shifts in the composition of demand could also be brought about by exogenous changes in relative prices faced by domestic consumers and producers. In Canada, such changes are often associated with movements in international commodity prices and the exchange rate.

Cao and Leung (2009) evaluate the impact of changes in the real exchange rate and commodity prices on sectoral employment growth. Given the sensitivity of Lilien's measure to the business cycle, Cao and Leung (2009) first obtain an estimate of the business cycle and the sensitivity of each sector's LFS employment share to the cycle, following an econometric technique used in Rissman (1997). The changes in the employment shares of each sector that are not related to the cycle can be used to calculate a cyclically adjusted Lilien measure. The change in each sector's cyclically adjusted employment share is then regressed on the growth in the aggregate real exchange rate, the growth in the energy and non-energy components of the commodity price index in real Canadian-dollar terms, a lagged dependent variable, and a constant term.[7] The employment shares predicted by the explanatory variables in each regression are then used to recalculate Lilien's measure of employment reallocation across sectors.

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6   The Canadian Productivity Accounts show that, between 1961 and 2007, multi-factor productivity grew 47 per cent in the goods sector and declined 1 per cent in the services sector. Over the same time period, growth in labour productivity increased by 232 per cent in goods, but by only 49 per cent in services.

7   The real exchange rate and real energy prices often move together. However, the correlation between the growth rates of the two series over the study period was 0.25. Thus, there should be enough variation in the data to distinguish separate effects.

The cyclically adjusted Lilien measure is similar to the measure based on the raw data (Charts 1 and 4), with the most notable exception being the absence of a peak in reallocation during the 1991 recession in the cyclically adjusted measure. The Lilien measure using the employment shares predicted by the regression model is generally below the cyclically adjusted measure because not all the variability in employment shares is the result of changes in the exchange rate or commodity prices. On average, the regressions can account for 75 per cent of the cyclically adjusted dispersion of employment growth.[8] As expected, just like the actual measure, the predicted measure of dispersion picks up after 2004. The appreciation of the dollar and the increase in commodity prices accounts for about half of the increase in the cyclically adjusted dispersion of employment growth since 2004.

Chart 4: Predicted and Cyclically Adjusted Measures of the Dispersion of Employment Growth

Predicted   Cyclically adjusted
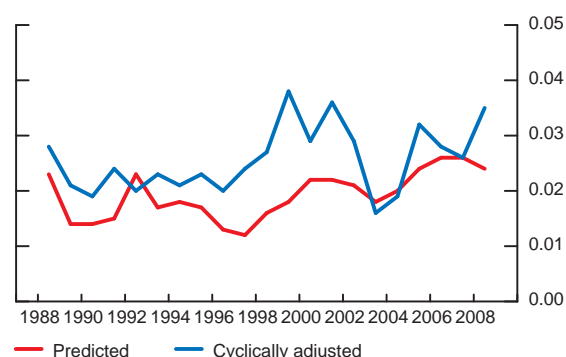
Source: Authors' calculations

Sources of reallocation across firms

Shocks to aggregate variables, such as exchange rates and commodity prices, can potentially cause reallocation across firms as well as sectors, since firms differ in their ability to adjust. Differences in managerial ability, size, financial health, relationship with credit suppliers, and markets served are among some of the factors that would affect how well a firm could adapt to shocks. Economic conditions are always in flux and thus would tend to continually drive reallocation across firms, but a larger effect would be expected when there are more rapid changes in economic conditions.

As mentioned in the first section, however, the job reallocation rate across firms appears to be smoother than the rate of sectoral dispersion of employment growth rates. This suggests that structural and institutional factors that change more slowly may be at work. Using data on U.S. manufacturing firms, Davis, Haltiwanger, and Schuh (1996) show that excess reallocation decreases with firm size, age, and average wage. They also suggest that reallocation rises with trade exposure, but do not find any supporting evidence. Smaller and younger firms are more likely to fail than older and larger ones, but at the same time their growth potential is also large. The dampening impact of high wages on reallocation occurs because higher wages reflect, in part, higher levels of human capital. In particular, they may reflect specific human capital, skills that are not easily transferable. Both workers and firms benefit from this specific capital, and so their relationship is likely more durable than in cases where skills are fully transferable. Finally, greater trade exposure implies that firms are faced with another set of potential shocks, which in turn, would lead to more variability in employment.

The job reallocation rate across firms appears to be smoother than the rate of sectoral dispersion of employment growth rates.

Cao and Leung (2009) examine the relationship among sectoral rates of excess job reallocation, the percentage of employees working in large firms in the sector, the level of human capital in the sector,[9] trade exposures at the sectoral level, the aggregate real exchange rate, and the energy and non-energy components of the commodity price index. They find that the level of human capital and the aggregate real exchange rate are not statistically significant.[10] Higher commodity prices are found to lower job reallocation rates. Perhaps increases in these prices raise the income of Canadians and reduce the profit pressures on firms enough to slow the rate at which less-profitable and productive firms are replaced by more-profitable and productive ones. The strong increase in commodity prices in recent years cannot account for

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8   The predicted change in sectoral employment shares when there are no changes in either the exchange rate or commodity prices (i.e., the constant terms in the regressions) yields a predicted dispersion measure of 0.011, or 43 per cent of the actual dispersion, on average. This could be interpreted as the effect of long-run trends in the employment shares. Fluctuations in the exchange rate and commodity prices account for the remaining 32 percentage points explained by the regression model.

9   The average age of employees and the percentage of employees with university degrees are used as proxies for the level of human capital.

10 The statistical insignificance of age also suggests that the decline in job reallocation is not related to population aging.

the decline in reallocation, however, because much of this decline occurred in the 1990s.

Cao and Leung (2009) also find, as predicted, that firm size and import competition are related to job reallocation rates, but that neither can account for the decline in the job reallocation rate over time. Import competition has been rising over time and, after a period of decline, the percentage of workers employed in firms with more than 500 employees has been stable since 1997.

> *Firm size and import competition are related to job reallocation rates, but neither can account for the decline in the job reallocation rate over time.*

In summary, while several factors that affect the job reallocation rate have been identified, no one factor can account for the decline in the rate. This fall may be associated with the "Great Moderation," the decline in the volatility of aggregate growth in gross domestic product (GDP) since the mid-1980s that has occurred in a number of OECD countries (Summers 2005).[11] However, the factors behind the Great Moderation are still being debated.

Implications for Aggregate Output and Productivity

Old plants and firms are continually being replaced by new ones that introduce updated products and production processes. An entire class of models (e.g., Aghion and Howitt 1992) uses this notion of creative destruction—the term coined by Schumpeter (1942)—and the reallocation of resources that goes with it, to explain economic growth. In this section, the efficiency of the labour reallocation process in Canada is first discussed. This is followed by a review of various studies examining the effects of labour reallocation.

Efficiency of the reallocation process

Caballero and Hammour (1998) characterize a poorly functioning process of labour reallocation as one that exhibits sclerosis and unbalanced restructuring. The first characteristic refers to the amount of reallocation;

the second, to timing. With respect to the amount of reallocation, Balakrishnan (2008) finds that Canada's rate of job reallocation was 2 percentage points (roughly 10 per cent) lower than that in the United States over the 1993–2004 period. Although not highlighted by Balakrishnan, it is perhaps even more disconcerting to note that the correlation he finds between job creation and job destruction is positive (0.49) for the United States, but negative (0.57) for Canada (see also Chart 5). When shocks cause job destruction to increase in the United States, the pace at which workers are absorbed by expanding firms and sectors also increases, albeit at a slower pace. In contrast, when job destruction increases in Canada, job creation also becomes more sluggish, thereby slowing the needed redeployment.

Chart 5: Rates of Job Creation and Job Destruction in Canada, 1992–2006
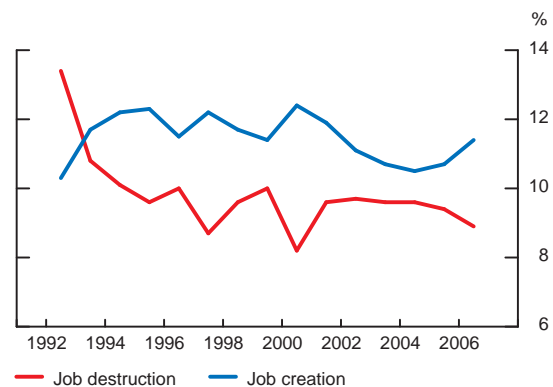
Source: Authors' calculations

More rigidities in the labour market in Canada than in the United States may be one reason behind the Canada–U.S. differences in labour adjustment. The supporting evidence for this argument is far from compelling, however. Grady and Macmillan (2007), for example, review the literature on interprovincial labour mobility in Canada and conclude that substantial barriers do not exist. Furthermore, while employment protection legislation in Canada is more stringent than in the United States (OECD 2004), Kuhn (2000) argues that the difference is negligible.

> *A slower pace of labour adjustment in Canada may also reflect more product market rigidities or greater difficulties in obtaining small business financing.*

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11 The Great Moderation in the United States is also associated with declining rates of job reallocation. See Davis et al. (2006), and Balakrishnan (2008).

A slower pace of labour adjustment in Canada may also reflect more product market rigidities or greater difficulties in obtaining small business financing. Indeed, the finding that the difference in Canada–U.S. job reallocation rates is the result of fewer reallocations associated with the birth and death of firms in Canada leads Balakrishnan (2008) to suggest that differences in product market rigidities play an important role. In this regard, there is evidence that anti-competitive product market regulation is somewhat more prevalent in Canada than in the United States (Conway et al. 2006). The slower rate of firm turnover and, by implication, labour adjustment could also be the result of greater difficulties in obtaining small business financing in Canada. Leung, Meh, and Terajima (2008) find, for instance, that small and medium-sized firms in Canada rely less on loans from financial institutions than their counterparts in the United States. However, this could indicate either less need for, or less availability of, credit in Canada. As a general conclusion, the sources of slower labour adjustment in Canada need to be investigated further.

Impact of the labour reallocation process

The models of creative destruction suggest that the effect of labour reallocation on output and productivity must be positive, but this is not necessarily the case. In the short run, the adjustment costs of redeploying workers from declining sectors and firms to expanding sectors and firms could impede output and productivity growth. Since sector- or firm-specific skills might not be transferable, workers new to the firm or sector need training. To quantify the effect of adjustment costs on aggregate output, Tapp (2007) builds a multi-sector model where firms can incur training costs to increase the skill of their workers. This match-specific skill is lost, however, if the worker leaves the firm. Tapp (2007) finds that, when calibrated to Canadian data, the cost of reallocating labour across sectors following a shock that mimics the one experienced by Canada in recent years is 3 per cent of aggregate output in the first year following the shock. The full adjustment takes five years.

As pointed out by Haltiwanger (2002), even over longer time periods, it is incorrect to assume that jobs are always reallocated from less-productive firms or sectors to more-productive ones. For example, in their analysis of the impact of trade liberalization on the manufacturing sector in Canada, Baldwin and Gu (2004) find that firms that became exporters achieved higher rates of labour productivity growth by increasing their product specialization and exploiting the benefits of longer production runs, while at the same time

decreasing their labour inputs. This suggests that the impact of labour reallocation on output and productivity is an empirical question in the sense that it is conditioned by measures taken by firms.

Many studies use accounting approaches to determine the impact of labour reallocation on aggregate labour productivity. In these accounting decompositions, shifts in labour increase aggregate productivity if labour is reallocated to firms or sectors with higher-than-average levels of productivity or growth. The effects of adjustment costs are not explicitly considered. To the extent that adjustment costs affect the growth of labour productivity in the short run, accounting exercises that decompose a change in aggregate productivity over a short period would be more likely to show that the effect of reallocation is negative. This is because the rates of labour productivity growth of sectors with rapidly expanding employment are likely being adversely affected by adjustment costs. Decompositions over a longer period are more likely to abstract from adjustment costs.

Using an accounting approach, Dupuis and Marcil (2008) show that the purely accounting effect of the recent labour reallocation across sectors has been positive, but small, accounting for approximately 7 per cent of labour productivity growth in the business sector over the 2003–07 period.[12] In contrast, Baldwin and Gu (2006) show that labour reallocation across firms accounted for roughly 35 per cent of labour productivity in manufacturing in Canada in the 1989–99 period.[13]

Analysis similar to that of Baldwin and Gu (2006) cannot be carried out for a larger segment of the Canadian economy because the necessary firm-level data are not readily available. To obtain an estimate of the impact of labour reallocation across firms on the aggregate economy, Cao and Leung (2009) regress sectoral labour productivity (LP) growth rates for the 17 sectors shown in Chart 3 on each sector's excess job reallocation rates. In addition to the reallocation rate, each sector is allowed to have a different average growth rate and a different sensitivity to the economic

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[12] Sharpe, Arsenault, and Ershov (2007) use an accounting methodology to examine the impact of interprovincial migration on labour productivity growth and find that it accounted for 4 per cent of trend growth in 2006.

[13] Baldwin and Gu (2006) also show that the importance of reallocation is increased if output is considered, rather than labour reallocation. They argue that the rise and decline of firms that underlies the reallocation of labour across firms is associated with competition in the product market, not the labour market. So, to isolate the effect of the competitive process, it is more appropriate to focus on changing output shares than on labour shares.

cycle, where the cycle is proxied by the change in the aggregate unemployment rate (UE):

$$\Delta \ln(LP_{it}) = \sum_i \alpha_{0i} + \alpha_1 \left(r_{it} - |c_{it} - d_{it}| \right) + \quad (2)$$
$$\sum_i \alpha_{2i} \Delta UE_t + e_{it}.$$

They find that the coefficient on excess job reallocation is 0.14 and statistically significant. This implies that the difference of two percentage points between excess job reallocation rates in Canada and the United States accounts for 0.3 percentage points of the Canada–U.S. difference in labour productivity growth rates.[14] This is significant, considering that the growth of U.S. labour productivity was, on average, 0.7 percentage points higher than Canada's over the 1993–2004 period studied by Balakrishnan (2008). In interpreting the relationship uncovered by the above regression, it is important to keep two points in mind. First, it can be argued that faster technological progress can lead to more reallocation within a sector because firms vary in their ability to adapt to changes in their environment. Thus, one reason why such a strong relationship is found is that causality is running in both directions. Second, the finding by no means implies that reallocation, in and of itself, is a source of productivity growth for firms. New and surviving firms must be taking actions to increase their productivity performance, such as adopting new technologies and increasing capital intensity, in order for their performance to be better than that of the firms they are replacing. Reallocation across firms is a process that promotes productivity gains at the sectoral and aggregate levels, but not at the firm level.

Conclusion

The reallocation of labour across sectors has picked up in recent years. A large part of this pickup can be traced to the appreciation of the Canadian dollar and rising commodity prices. The impact of this intersectoral reallocation on labour productivity is minor, however. In contrast, the most recent data show a slowing or stabilization of labour reallocation across firms. This seems to be at variance with the sharp movement in relative prices since 2003, which would be expected to intensify the amount of reallocation, not decrease it. The gradual nature of the decline suggests that structural and/or institutional factors may be at work, but that these factors have not been identified. With regard to the impact of labour reallocation across firms, it is found that it generates substantial labour productivity gains in manufacturing and the business sector as a whole.

Overall, the response of the Canadian labour market to the appreciation of the dollar and the sharp increase in commodity prices showed that Canada does have relatively flexible labour and product markets. There is still room for improvement, however. Further research must be undertaken to understand the differences in the pace of job reallocation between Canada and the United States and the negative correlation between job creation and destruction in Canada. Developing a greater understanding of these areas is important because of the role that reallocation of resources across firms plays in the productivity performance of the country.

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14 As mentioned above, Balakrishnan (2008) finds that the U.S. job reallocation rate is 2 percentage points higher than the Canadian rate over the 1993–2004 period. A portion of this U.S.–Canada difference can be accounted for by Balakrishnan's inclusion of data from the public administration sector in the Canadian data, although it is excluded from the U.S. data. Cao and Leung (2009) show that removing public administration cuts the U.S.–Canada difference in job reallocation rates by 0.25 to 1.5 percentage points. However, net employment growth was stronger in Canada than in the United States; the U.S.-Canada difference in net employment growth was roughly -0.5 percentage points. Since excess job reallocation is job reallocation minus net employment growth, the U.S.–Canada difference in excess job reallocation is approximately 2 percentage points.

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