

Editor's Overview

THIS ISSUE OF THE *International Productivity Monitor* contains five articles: an introductory piece dissecting where Canada's productivity problem really lies; an investigation of the relationship between innovation and productivity in Canadian manufacturing establishments; an examination of the phenomenon of deindustrialization of the manufacturing sector in the context of Sweden; a detailed examination of the industry contributions to real GDP growth and labour productivity growth in Canada and the United States; and an overview of productivity trends in the Canadian agricultural sector over the last half century.

It is well known that Canada's productivity performance in recent years has been weak. But the causes of this situation are still poorly understood. In the first article, **Don Drummond** from Queen's University, and a former senior Finance Canada official as well as chief economist at a major bank, provides a fascinating and highly readable account of the evolution of his own views on this issue. Until very recently he had believed that inappropriate public policy was at the roots of the productivity problem. He points out that despite public policy becoming much more market-oriented in this country, productivity growth has actually fallen off since 2000. Drummond now believes that the private sector bears more responsibility for the situation than previously thought, given both the machinery and equipment investment and R&D gaps between the Canadian and U.S. business sectors. He also cogently argues that to improve Canada's productivity performance we need a better understanding of firm behavior and calls for a major research effort that would tackle the productivity conundrum from a micro-economic perspective.

Innovation is widely recognized as a major driver of productivity growth. But given the different types of innovative activity and measures of innovation, quantifying the exact relationship between innovation and productivity has proven challenging to researchers. In the second article,

Pierre Therrien from Industry Canada and **Petr Hanel** from the Université de Sherbrooke shed light on this issue through an econometric analysis linking innovation and productivity in Canadian manufacturing establishments. They find that greater innovation, defined as higher levels of innovation expenditures, leads to better innovation outcomes, as measured by greater sales of innovative products per employee. More innovative firms are found to have higher levels of labour productivity. Indeed, an increase of 1 per cent of innovation sales per employee is associated with an increase in labour productivity of 0.22 per cent. The authors conclude that a weak performance in selling innovative products seemed to have been an important barrier to better productivity performance in Canada.

Deindustrialization, defined as the decline in manufacturing's share of total employment, has taken place in all developed countries. In the third article, **Daniel Lind** from Unionen, Sweden's white collar trade union, analyzes the factors behind this development in the Swedish context. He identifies much more rapid productivity growth in manufacturing relative to the rest of the economy as the primary driver of the process. In addition to the decline in the relative employment share, this higher productivity growth leads to falling relative prices of manufactured goods and a fall in the nominal GDP share of manufacturing, but no necessary

decline in the real GDP share. Lind also finds that increased integration of production between manufacturing firms and firms in other sectors of the economy, especially knowledge-intensive services, has meant that some of the employment loss in the manufacturing sector has been offset by job gains elsewhere. This means that the overall decline in the number of persons employed to satisfy final demand for manufactured goods has not fallen as much as indicated by employment trends in the narrowly defined manufacturing sector.

The measurement of real GDP is sensitive to the formula used to combine the contribution of individual industries into an aggregate number. The weights used for this aggregation process are relative output prices, which vary significantly over time. In the fourth article, **Michael-John Almon** and **Jianmin Tang** from Industry Canada develop estimates of industry contributions to both real output and labour productivity growth in Canada and the United States from 1987 to 2008 using a decomposition technique consistent with a chain Fisher index. In contrast to the constant dollar estimates of real GDP based on fixed weights reflecting relative prices in a base period, chain dollar estimates use weights that vary to reflect current relative prices. The resulting chain dollar-based industry contributions can differ significantly from contributions derived from constant dollar estimates.

Almon and Tang find that the slowdown in labour productivity growth in Canada between the 1987-2000 and 2000-2008 period is completely explained by the fall-off in the contribution from manufacturing, due to both slower productivity growth in the sector and the falling relative prices of manufacturing goods. Despite a fall in labour productivity of around 4 per cent per year between 2000 and 2008, the mining and oil and gas sector actually contributed 0.64 percentage points per year of the 0.79 per cent increase in business sector labour productivity over the period. The rising prices of the sector's output explain this paradoxical development.

Despite the mediocre performance of aggregate productivity in Canada, some sectors have excelled. This is the case of agriculture, a productivity success story. In the fifth and final article of the issue **Ricardo de Avillez** from the Centre for the Study of Living Standards analyzes developments in agriculture in Canada over the last half century. Real GDP per hour in the sector has advanced at an amazing 3.8 per cent per year over the 1961-2007 period, in contrast to 2.1 per cent in the business sector. Unlike the business sector, agriculture has experienced no slowdown in productivity growth since 2000. De Avillez attributes agriculture's productivity success to the ability of the sector to substitute both capital goods and intermediate goods such as fertilizer for labour as well as rapid technological developments in the sector.