

Editor's Overview

THE 24TH ISSUE OF THE *International Productivity Monitor* (IPM) published by the Centre for the Study of Living Standards contains ten contributions. Topics covered include the World KLEMS initiative, the new concept of human capital productivity, a symposium on the measurement of multifactor productivity in Canada, the long-term outlook for productivity growth in Canada, methodologies for the estimation of industry contributions to aggregate labour productivity growth, and the political economy of economic and productivity growth.

Advances in our understanding of productivity trends require better data. A major initiative in this area is the World KLEMS project, which generates data sets for inputs of capital (K), labour (L), energy (E), materials (M) and services (S) at the industry level for countries around the world. In the lead article, **Dale W. Jorgenson** from Harvard University, author of many seminal papers on productivity topics and leader of the World KLEMS initiative, shows how these data sets provide a framework for productivity measurement and analysis at the industry level, filling a void in the system of national accounts. Using KLEMS data for the United States for the 1947-2010 period, he provides a detailed examination of the sources of economic growth, shedding light on the roles played by IT-producing, IT-using, and non-IT industries in the growth process.

The concept of human capital, defined as the discounted value of future earnings, has a long history in economics. But human capital has never been directly linked to productivity. In the second article, **Barbara Fraumeni** from the University of Southern Maine and the China Center for Human Capital and Labour Market Research, and an expert in the human capital field, makes a pioneering attempt to bring the concepts of human capital and labour productivity together by introducing a new term, human capital productivity, defined as the ratio between an index of discounted future output and an

index of human capital. While still in its very early stages of conceptual development and without empirical estimates, the concept of human capital productivity may contribute significantly to our understanding of the role human capital plays in potential output growth.

Official estimates of business sector multifactor productivity (MFP) growth in Canada paint a dismal picture. Statistics Canada reports that MFP advanced at a meager 0.28 per cent average annual rate over the 1961-2011 period and that the level of MFP was actually lower in 2011 than in 1977. MFP growth is often considered a proxy for the pace of innovation in an economy, or at least the rate of disembodied technical change. Given the major new technologies that have been introduced over the last one third of a century, many find it difficult to accept that MFP growth has been negative. To address the question of the accuracy of official MFP estimates, this issue of the IPM features a symposium on the measurement of MFP in Canada.

In the first article of the symposium, **Erwin Diewert** from the University of British Columbia and the University of New South Wales, a world expert in productivity measurement, and **Emily Yu** from the Department of Foreign Affairs and International Trade put forward new estimates of MFP growth for the Canadian business sector, finding that MFP actually grew at a 1.03 per cent average annual rate between 1961 and 2011. This 0.75 percentage point differen-

tial with the official MFP growth rate is accounted for by significantly lower capital services growth: 3.0 per cent versus 4.8 per cent. They make the case that the Statistics Canada capital services growth is implausibly high.

In the second article in the symposium, **Wulong Gu** from Statistics Canada responds to Diewert and Yu by identifying three methodological choices these authors made that account for the discrepancy in capital services growth: the use of a top-down approach to the aggregation of assets in contrast to the bottom up approach used by Statistics Canada; the assumption that the real rate of return is equalized across assets, in contrast to Statistics Canada's assumption that the nominal rate of return is equalized; and the use of a much smaller list of assets. Gu argues that Statistics Canada estimates follow international practices adopted by other statistical agencies in order to make MFP estimates internationally comparable.

In a rejoinder to Gu, **Erwin Diewert** agrees that his use of the top-down approach involves some aggregation bias that the bottom-up approach avoids and notes that he would have preferred to have used this latter approach if more detailed data had been publically available. The ability of outside researchers to replicate Statistics Canada's MFP estimates should be encouraged as this can serve as a check on the reliability of the official estimates. Diewert also shows that Statistics Canada's assumption that expected capital gains equal ex post capital gains can lead to negative user costs of capital, which are not plausible.

The symposium contains two additional contributions to the debate. In the first, **Paul Schreyer** from the OECD notes that there is no single method for the calculation of the user cost of capital, and hence capital services, that constitutes an international standard. He argues that it is worth pursuing this objective and states that the OECD is willing to contribute. He also

makes a useful distinction between effective productivity growth and underlying productivity growth. The former adds up industry productivity growth while the latter includes the reallocation effects related to a departure from the assumption of efficient input markets, that is inputs growing more rapidly in those industries that pay relatively higher prices for those inputs than other industries. Schreyer points out that the large reallocation effects found for Canada by Gu suggest significant productivity gains could be realized through more efficient resources reallocation.

In the second, **Michael Harper**, formerly with the U.S. Bureau of Labor Statistics (BLS), and **Alice Nakamura** and **Lu Zhang** from the University of Alberta discuss the BLS approach to MFP measurement, and compare this approach to that taken by Statistics Canada. They note that transparency has been a key hallmark of the BLS approach and that the agency has worked closely and shared data with other government departments and academic economists interested in MFP and that this interaction with data users has proven very beneficial to everyone involved. They also note that the BLS uses a pragmatic mixture of exogenous and endogenous rates of return in its estimation of the user cost of capital. This means that the MFP estimates produced by Statistics Canada and the BLS are not strictly speaking comparable given that Statistics Canada uses endogenous rates of return.

The articles in the symposium greatly advance our understanding of the measurement of multi-factor productivity in Canada. The symposium highlights the sensitivity of capital services estimates and hence MFP estimates, to the assumptions related to the user cost of capital, particularly the treatment of the rate of return. The importance of transparency in the construction of MFP estimates is also a key theme of the symposium. Everyone benefits from

researchers outside Statistics Canada having access to data that allow them to replicate the official estimates. Stronger measured MFP growth arising from slower capital services growth means that capital intensity growth is weaker. This changes the relative importance of the two main sources of labour productivity growth (MFP and capital deepening). There is no effect on labour productivity growth.

Labour productivity growth in Canada has averaged well less than 1 per cent since 2000. Whether this pace continues, or whether productivity growth returns to the faster pace of the pre-2000 period, will be crucial for the economic destiny of the country. In the eighth article, **Peter Jarrett** from the OECD provides a relatively optimistic long-term outlook for productivity in Canada based on an OECD modeling exercise. While admitting that the factors that explain the poor productivity performance of the 2000s are poorly understood, he sees output per worker growth averaging 1.7 per cent per year over the next half century, nearly double the rate for the 2000s, as the Canadian economy returns to its long-term labour productivity growth path.

Productivity analysis normally includes the estimation of sectoral contributions to aggregate labour productivity growth. Unfortunately,

there is no unique way to decompose productivity growth into its sectoral or industry components. Results can vary significantly depending on the choice of decomposition formula. In the ninth article, **Ricardo de Avillez** from the Centre for the Study of Living Standards reviews three decomposition formulas, arguing that all three provide significant, and complementary, insights into the role industries play in adding to or subtracting from overall productivity growth. A particularly interesting finding refers to the oil and gas sector, which is found to have made a large positive contribution, or a negative contribution, to aggregate labour productivity growth depending on whether oil and gas prices increases are included, or excluded, from the decomposition formula.

One of the most influential books on economics published in 2012 has been *Why Nations Fail: The Origins of Power, Prosperity and Poverty* by Daron Acemoglu from MIT and James Robinson from Harvard University. The book argues that it is man-made economic and political institutions that underlie economic success, including productivity performance. In the summer of 2012, **Christopher Ragan** from McGill University interviewed both authors. The final article is an edited transcript of that interview.

