Editor's Overview

THE 31ST ISSUE OF THE *International Productivity Monitor* contains articles on the following topics: the productivity paradox in the New Digital Economy; the industry origins of Canada's weaker productivity growth; the factors behind the gap between productivity and median wage growth in Canada; a review of Robert J. Gordon's new book, *The Rise and Fall of American Growth*, with a response by the author; and a symposium on issues related to total factor productivity growth, including its sources, industry decompositions, and relationship to partial productivity measures.

The rise of the New Digital Economy is unquestionably altering the dynamics of economic growth. Yet despite the productivity-enhancing potential of many of these new technologies, productivity growth throughout the world has slowed down since the mid-2000s. In the lead article in this issue, **Bart van Ark** from The Conference Board and the University of Groningen addresses this paradoxical situation. He makes the case that we are currently in an installation phase where the effects of the new digital economy are under the radar screen of aggregate productivity growth and are manifesting themselves in rapidly falling prices of ICT assets, increased spending on ICT services, and greater use of intangible assets. Once digital technologies are widely diffused, the deployment phase will see stronger productivity growth.

Labour productivity growth in Canada has fallen off considerably since 2000. In the second article, **John R. Baldwin and Michael Willox** from Statistics Canada examine the origins of this slower growth. They develop a methodology that decomposes labour productivity growth at the aggregate and industry level into within-industry effects and reallocation effects. They find that of the 0.81 percentage point fall-off in business sector output per hour growth in Canada between 1989-2000 and 2000-2014, 1.05 percentage points was due to direct or within-industry productivity effects. Favourable reallocation effects in labour input added to aggregate productivity growth after 2000 and reduced the slowdown between periods by 0.23 points. From an industry perspective, three industries - manufacturing, mining, oil and gas, and finance, insurance and real estate - accounted for all of the post-2000 productivity slowdown.

Many Canadians feel they are not sharing in the income gains from productivity growth. In the third article, **James Uguccioni** from the University of Toronto shows that this perception is based in reality. Between 1976 and 2014 median hourly real wages in Canada grew at a meagre 0.1 per cent per year, while output per hour advanced at a 1.1 per cent average annual rate. The author decomposes this 1.0 percentage point gap and finds that rising earnings inequality accounts for about one half, with labour's falling share of national income responsible for one third. Real wage growth has been fastest at the top and bottom of the earnings distribution, suggesting a hollowing out of the middle class.

One of the most important publishing events in 2016 for economists has been the release of *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War* by Northwestern University economist **Robert J. Gordon**. The fourth article in this issue features of review of the book by **Daniel E. Sichel** of Wellesley College, with a response by the author himself.

Sichel points out that Gordon has actually written two books, the first on the dramatic change in U.S. living standards since 1870 and the second on the post-1970 period and the future where the drivers of strong productivity growth up to 1970 cannot be repeated. Sichel has high praise for the first book, calling it truly extraordinary in coverage and creativity. He is less enthusiastic about the second book. He finds it more speculative, downplaying the factors such as digital technologies that point to an improved productivity performance going forward.

Gordon takes issue with Sichel's optimism and points out that the United States has already experienced slower productivity growth for 35 out of 45 years since 1970 (the 1995-2004 period is the exception). He believes that the digital revolution will not alter economic life as profoundly, or along as many dimensions, as earlier great inventions, especially electricity. In addition, a number of headwinds including a plateau in educational attainment, the growth of inequality, and sociological decay have negative implications for median income growth.

For many if not most economists, total factor productivity (TFP) is the most important and fundamental productivity concept or measure. The last three articles in this issue comprise a symposium on the topic of TFP.

The first article in the symposium by **Nicholas Oulton** from the London School of Economics and the National Institute of Economic and Social Research provides a thorough examination of the sources of TFP growth, based on an empirical analysis of TFP trends in 15 EU countries, the United States, Japan and Australia over the 1970-2007 period. He finds that any attempt to eliminate TFP from the growth story and replace it with a wider or better measure of capital seems unlikely to succeed. He concludes that it is unfortunate that measurement error plays such a prominent role in the TFP discussion, and that until there is improved measurement, the mystery of TFP is likely to remain unresolved.

The second article in the symposium by **Matthew Calver** from Finance Canada and **Alexander Murray** from the Centre for the Study of Living Standards first discusses methodologies for the estimation of industry contributions to multifactor productivity growth. They then decompose MFP growth in Canada over the 1997-2014 period by industry and by province. Their results are methodology-dependent. The decomposition technique that includes relative price changes as contributing to aggregate MFP finds that the mining and oil and gas sector, and the provinces where this sector is concentrated, made by far the largest contribution to aggregate MFP growth because of the large increases in output prices over the period. In contrast, the technique that excludes relative price movements finds that manufacturing and Ontario (the province where manufacturing is concentrated) made the largest contribution.

The third article in the symposium by A**lexander Murray** from the Centre for the Study of Living Standards provides an assessment of the strengths and weakness of partial versus total factor productivity measures. He points out that partial productivity measures provide an incomplete picture of the efficiency with which all inputs are being employed. However, TFP suffers from a number of weaknesses, including burdensome data requirements, and complex methodological choices about which there is no expert consensus. This results in a lack of transparency and difficulty for non-experts to understand. He concludes that productivity analysts should adopt a balanced, context- appropriate approach that incorporates both types of productivity measure.