Canadian Labour Market and Skills Researcher Network

Working Paper No. 36

Inter-temporal and Inter-Industry Effects of Population Ageing: A General Equilibrium Assessment for Canada

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July 2009

CLSRN is supported by Human Resources and Skills Development Canada (HRSDC) and the Social Sciences and Humanities Research Council of Canada (SSHRC). All opinions are those of the authors and do not reflect the views of HRSDC or the SSHRC.

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Abstract. The objective of this paper is to examine the inter-industry and labour market occupational effects of population ageing in Canada, using a computable general equilibrium overlapping-generations model. The model is calibrated along a balanced-growth path, taking into account labour-augmenting (Harrod-neutral) technical progress. It also accounts for heterogeneity at the household level, using 25 occupation-specific earnings profiles. In addition to the impact of slower labour force growth, the model captures the shift in sectoral composition of final demand. The latter is due to different consumption preferences of older individuals. Moreover, a wage curve is introduced to explore the impact of population ageing on the unemployment rate. The simulation results indicate that the growth in real GDP per capita could decline by nearly one percentage point between 2006 and 2050. Besides, the production of services, in percent of total GDP, is projected to increase in the long-run, although the analysis shows more modest changes in production shares than in previous studies. The results also suggest that the equilibrium unemployment rate is likely to decline by more than 2 percentage points in the long run. The impact also varies quite significantly at the occupational level.

JEL Classification: D58, J11, O40, O51
Keywords: Population ageing, growth, general equilibrium model, overlapping generations, Canada.

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Executive summary

The objective of this study is to assess the inter-industry and labour market occupational effects of population ageing in Canada, using economic simulations performed with a computable overlapping-generations model. In the model, the population ageing shock replicates both a rise in the old-age dependency ratio and a decline in population growth rate. The old-age dependency ratio (i.e., the ratio of population aged 65+ relative to the working-age population) is expected to double over the next 40 years, rising from a current level of 20% to 40% in 2050. Also, the population growth rate is projected to decline from 1% to 0.3% in 2050. These changes are projected to slow the growth in the labour force and to raise pressures in labour markets. In addition, the model captures the shift in the sectoral composition of final demand (e.g., towards Health or Accommodation and Leisure) that will be induced by population ageing. For instance, older workers consume more health services than young workers. In general, these are more labour-intensive sectors. Moreover, we allow for the presence of unemployment in the labour market. This is achieved by the inclusion of an empirical wage curve which depicts a negative relation between the unemployment rate and the real wage rate: wages in labour markets with lower unemployment rate tend to be higher than wages in markets with higher unemployment rates. Consequently, a future decline in unemployment would lead to an upward pressure on wages.

The simulation results indicate that growth in real GDP per capita could decline by nearly one percentage point in the long run. As labour force growth is projected to slow very significantly, the unemployment rate would decrease by 2.7 percentage points in the long run, leading to increased pressure on wages (+12 percent on average). At the sectoral level, production costs would increase more in labour-intensive sectors. Hence, production would expand more in sectors with lower labour share in value-added. This is the case of Primary industries, and Finance, Insurance and Real Estate. Moreover, the demand effect, which is represented by the change in consumption preferences of older workers as well as the simulated shift in government consumption in favour of the health sector, would mitigate some of the long-run negative effects on labour-intensive service industries such as Health, Accommodation and Leisure, Other Services and Transport and Storage industries. On the other hand, real wage pressures would rise across all occupational groups. Wage pressures in Management occupations, Business, Finance and Administration, Health, Social Science and Education as well as occupations in Primary industries would be well above average. In contrast, wage pressures in Processing, Manufacturing, Sales and Trades could be well below average.

Finally, we conclude that there are three important structural implications of population ageing for the labour market: 1) the contribution of labour supply (quantity) to economic growth would decline leading to a more important role for physical capital and investment in knowledge in fostering labour productivity

(quality); 2) the equilibrium unemployment rate would fall significantly and likely achieve an unprecedented low level; 3) significant distributional effects are expected, and will be caused by rising disparity in occupational unemployment and wage rates. This implies that the distributional impact of population ageing is a very important element to consider in future research.