Structural change in the Australian economy, 2011 to 2023: An Historical CGE analysis

We run a CGE simulation of the period 2011 to 2023 to elucidate recent changes in technologies and tastes that have taken place in the Australian economy with special emphasis on employment classified by occupation and educational attainment. We use VUEF, a recursive dynamic CGE model of the Australian economy calibrated to include employment by occupation at the ANZSCO Minor Group level, a classification that identifies 97 occupations.

Results from the historical simulation are used in a forecast simulation for the Australian economy, again with particular focus on employment classified by occupation and educational attainment, but the focus of this paper is structural change observed over the historical period.

Over the historical period (2011 to 2023), the Australian economy grew by 33 per cent, with household demand accounting for a declining share with growth of 27 per cent, and government final consumption growing by 63 per cent. Growth in aggregate investment was relatively weak at 19 per cent and the trade balance moved toward surplus. Employment (hours) grew by 15 per cent.

While output per hour of employment grew over the historical period, assuming a fixed rate of return on capital the macroeconomic results points towards a low contribution from multifactor productivity, with real wage growth over the period (10 per cent) instead driven by capital deepening. This is evident because a strong increase in the terms of trade (31 per cent) meant that although wage growth was reasonable relative to the CPI, labour costs grew very little relative to the price of GDP (32 per cent).

At a more detailed level, observations for the ratio of output to labour are imposed by industry, along with employment by industry, meaning that output by industry is tied down. This indicates both structural change in demand, and technical change by industry. An interesting result here is that manufacturing, contrary to conventional wisdom, appears to be growing more labour-intensive rather than less. A possible explanation for this is that the most automatable types of manufacturing, such as light manufactures, were already heavily automated in Australia or replaced by imports before the beginning of the study period in 2011. Manufacturing activity that remains in Australia may be more highly-skilled and labour intensive.

Observations for imports and exports of manufactured goods are also imposed. Along with the observations of industry output, these results indicate structural change in household tastes, foreign demand, and import penetration, including:

- strong general domestic preference shifts towards imported textiles, clothing and footwear, printed products, petroleum products and motor vehicles
- household preference shifts towards construction services, wine, and “other” education (non-school or university), and against printed products (indicating a double negative for domestic printing, as there is also a shift towards imported printed products)
- strong growth in demand for exports of meat products and mining products.

Further, observations of employment by occupation are imposed, implying structural change in employment at the occupational level. Here we find that occupations to grow more than would be expected based on industry growth are mainly professional and management occupations, including

Information and Organisation Professionals, ICT Professionals and Database Administrators, Business Administration Managers, and Media Professionals. In the lower-wage occupations, we observe a strong shift towards Delivery Drivers. Growth in the caring occupations (such as aged and disabled carers, and education aides) is strong, but no stronger than would be expected given the growth in the social assistance industries.

Another interesting feature of the occupational results is the shift in roles within the clerical occupations. Here we find stronger-than-expected growth in General Clerks, offset by relatively weak growth in more specific roles including Personal Assistants and Secretaries, Keyboard Operators, Receptionists and Accounting Clerks and Bookkeepers.

Overall we conclude that the period 2011 to 2023 is characterised by low overall productivity growth, with low growth in domestic household and investment expenditure. However, the economy was by no means stagnant, with taste and technological changes, particularly in manufacturing and the occupational composition of employment.