https://doi.org/10.17868/72629

Resilience in a Behavioural/Keynesian Regional Model Annex: Additional Variables and Sensitivity Analysis

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Tuesday 9th June, 2020

A.1 Additional Variables

Figures A.1.1 and A.1.2 give the time paths for employment and household income for simulations with the perfect, myopic and imperfect foresight investment functions. Note that these charts are qualitatively similar to those for the GDP results in the main body of paper.

For these two endogenous variables, the perfect foresight simulations exhibit the smallest variation, have a broadly symmetric time path and both the employment and household income figures are above their initial values in period 6; that is, immediately after the temporary negative export shock is removed. The myopic simulations again show reductions whose absolute size increases for the whole period over which the shock operates. The subsequent recovery is much slower and is not complete until period 22. The imperfect foresight case has the most pronounced fall in employment and household income over periods 1 to 5. Subsequently the recovery is faster than for the myopic simulations and there is subsequent overshooting and damped oscillations as the variables return to their original values.

The short-run, period-1, proportionate reduction in employment is always greater than the corresponding change in GDP. This is because in this period capital stock is fixed so that changes in employment are the only source of changes in GDP. However, by period 3 the fall in GDP is proportionately larger, as against the base year value, than employment as the capital stock downwardly adjusts following significant reductions in investment. In period 6 there is a large percentage increase in employment, as against the period-5 value, in the imperfect foresight, but particularly the myopic cases.

Figure A.1.1: Period-by-period adjustment in employment: percentage deviation from the initial value

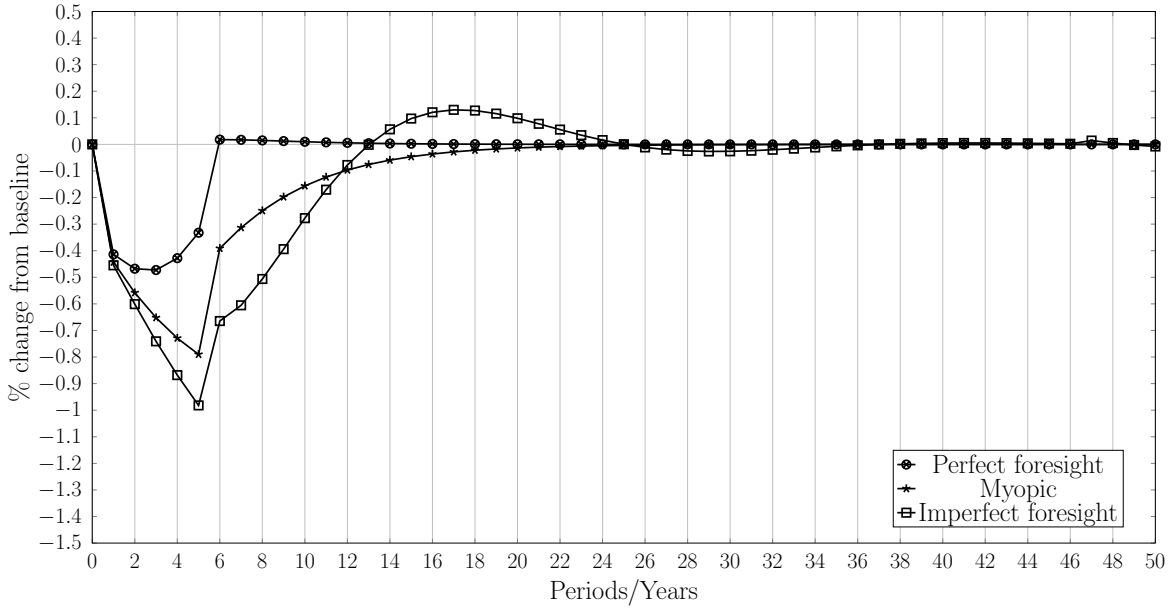
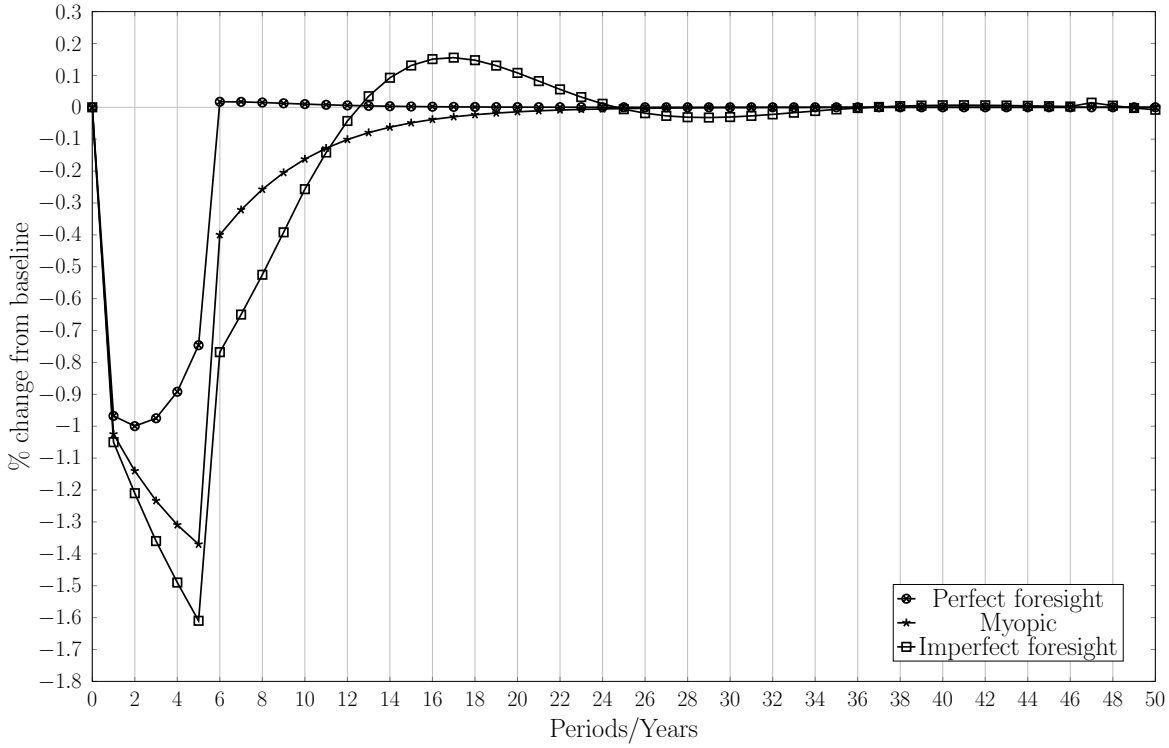


Figure A.1.2: Period-by-period adjustment in household income: percentage deviation from the initial value



A.2 Sensitivity Analysis

Figures A.2.1 to A.2.6 show the sensitivity of the path of the changes in GDP to variations in the nature of the exogenous demand shock. Figures A.2.7 to A.2.9 indicate the sensitivity of the GDP results to variations in the nature of the labour market. In all these cases the sensitivity is shown for each of the three investment functions.

Figures A.2.1 to A.2.3 concern the size of the reduction in export demand around the value of 5% used in the main body of the text. In each Figure results are shown for reductions of 4% and 6% as well as the default reduction of 5%. Figures A.2.1, A.2.2 and A.2.3 are for the perfect foresight, myopic expectations and imperfect foresight investment functions respectively. As can be seen, these variations have only quantitative, not qualitative, impacts on the GDP changes.

Figure A.2.1: Perfect foresight: Period-by-period adjustment in GDP (size sensitivity)

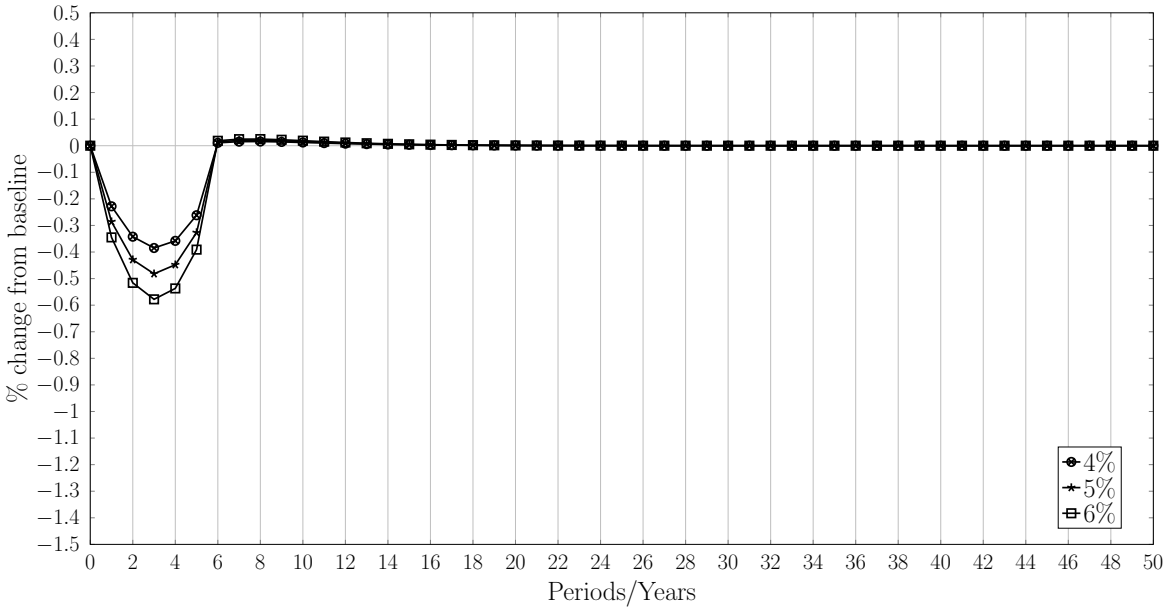


Figure A.2.2: Myopic: Period-by-period adjustment in GDP (size sensitivity)

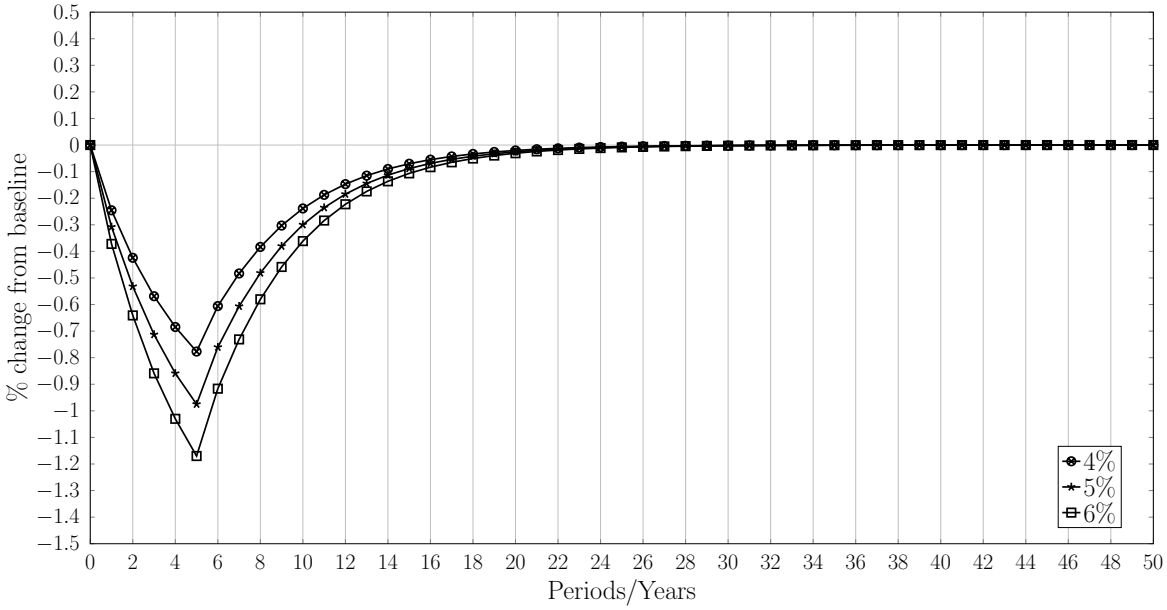
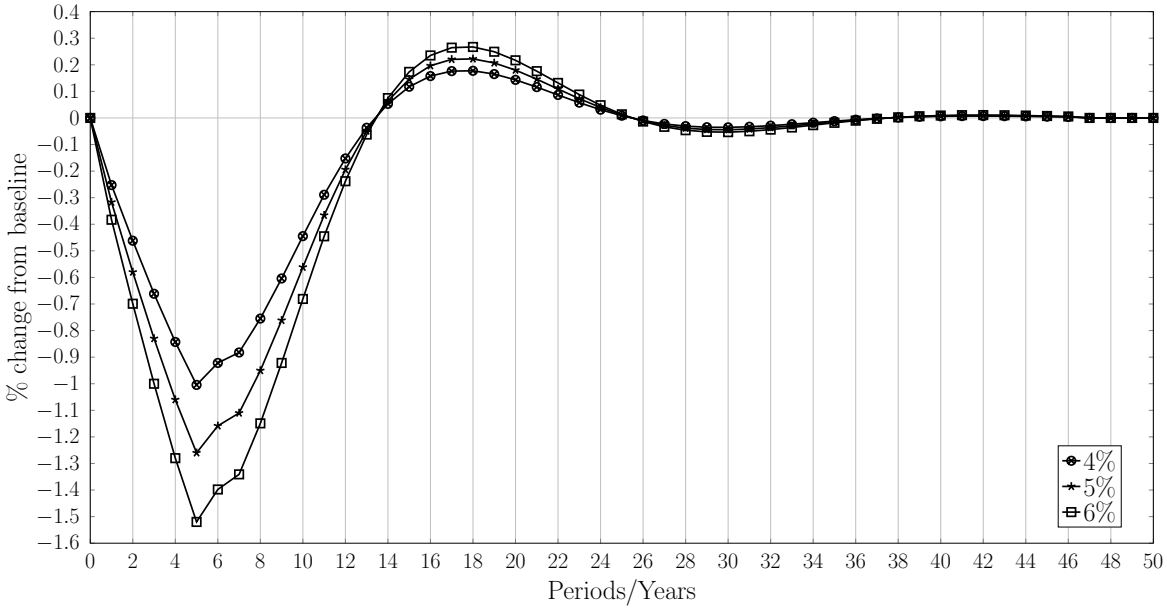


Figure A.2.3: Imperfect foresight: Period-by-period adjustment in GDP (size sensitivity)



Following an identical pattern, Figures A.2.4 to A.2.6 give the impact of varying the length of the time period over which the negative export demand shock applies. The figures show the results for time periods of lengths 4 and 6 years, together with the default value of 5 years used in the main body of the text. Varying the time period implies simultaneously increasing the maximum negative impact of the demand reduction and also changing the period over which the GDP adjustments occur. For the myopic and imperfect foresight investment cases, shown in Figures A.2.5 and A.2.6, there are no significant qualitative differences in the time path of adjustment as the length of the shock is increased. However, with the perfect foresight case reported in Figure A.2.4, for the 4 year shock the initial overshooting once the shock is withdrawn is much more pronounced than with the default case and, with the 6 year shock, the overshooting is completely eliminated.

Figure A.2.4: Perfect foresight: Period-by-period adjustment in GDP (duration sensitivity)

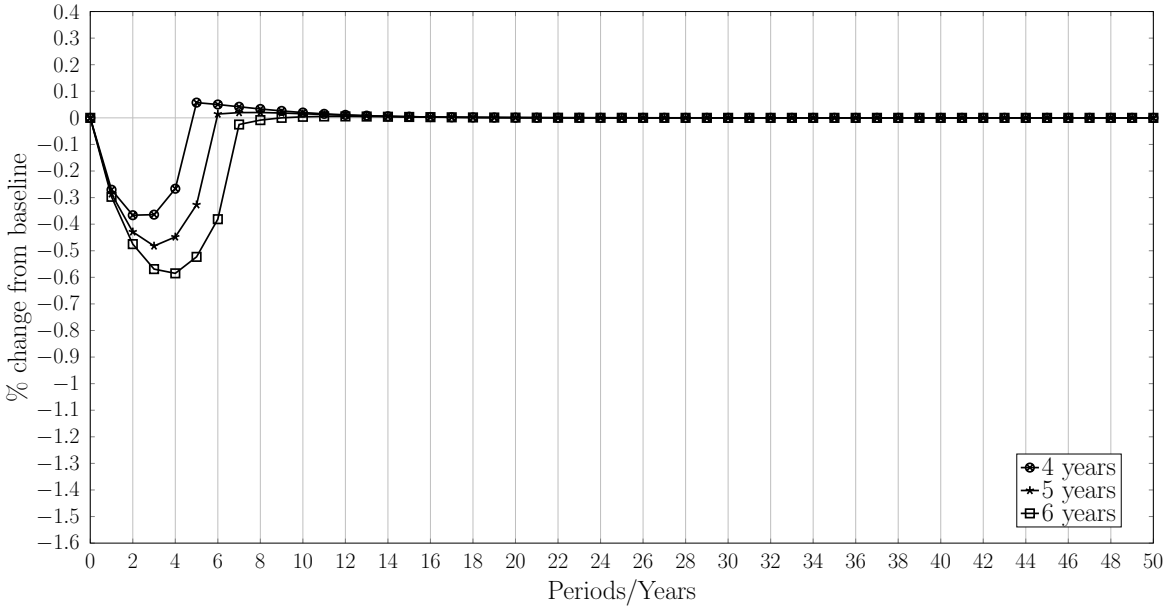


Figure A.2.5: Myopic: Period-by-period adjustment in GDP (duration sensitivity)

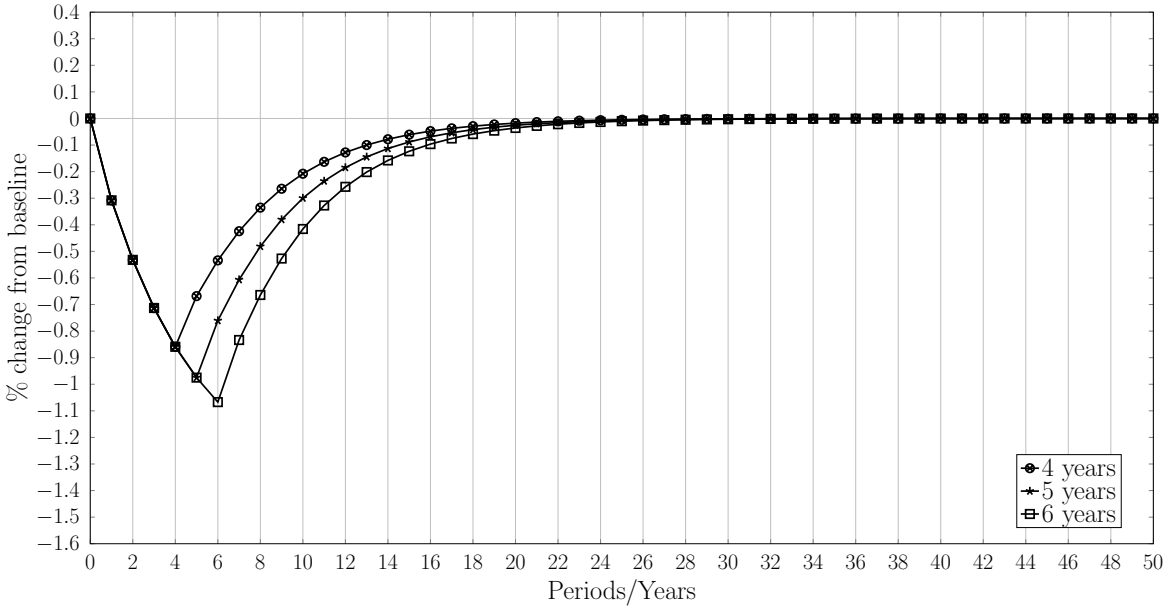
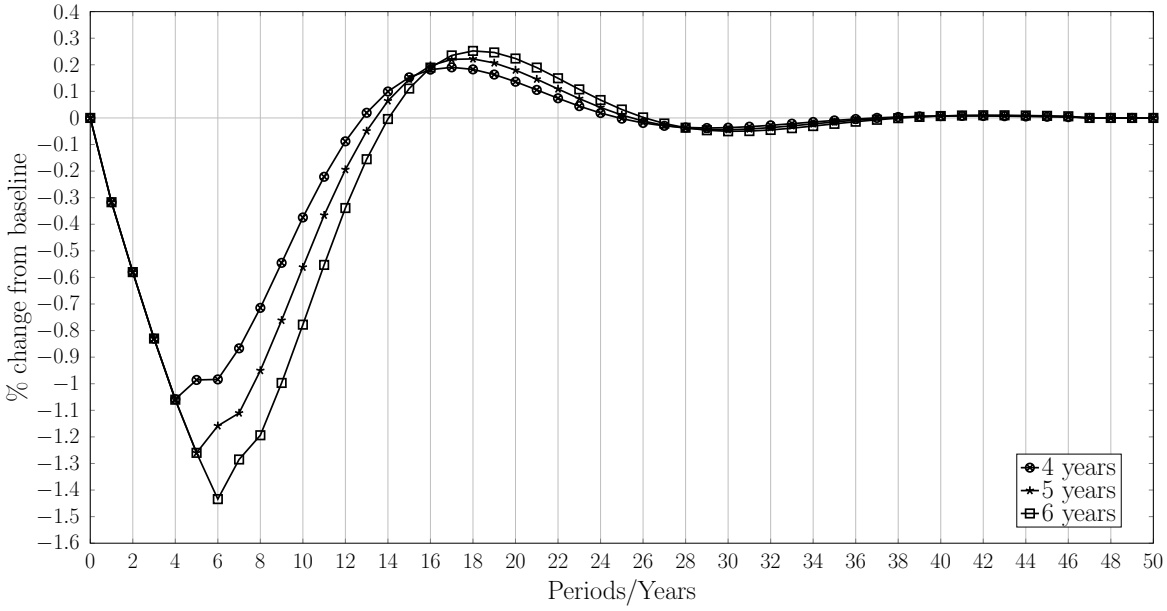


Figure A.2.6: Imperfect foresight: Period-by-period adjustment in GDP (duration sensitivity)



Finally, the results reported in Figures A.2.7 to A.2.9 follow a similar pattern, but in this case for variations in the nature of the labour market, with the wage curve (WC) as the default used in the main body of the text. The alternatives are the fixed employment (FE) and the fixed nominal wage (FNW) labour market closures. The FE labour market is characterised by a fixed labour supply, no unemployment and a flexible wage that adjusts to equate demand and supply of labour. In the FNW the nominal wage is fixed and the unemployment rate adjusts to equate labour demand and supply. In each figure the broad qualitative characteristics of the GDP time path are retained through all the labour market options shown, but there are big differences in the scale of impacts. Also both the FE and FNW labour markets generate time paths for the myopic and imperfect foresight investment functions that are closer than with the wage curve labour market closure.

Figure A.2.7: Perfect foresight: Period-by-period adjustment in GDP (labour market sensitivity)

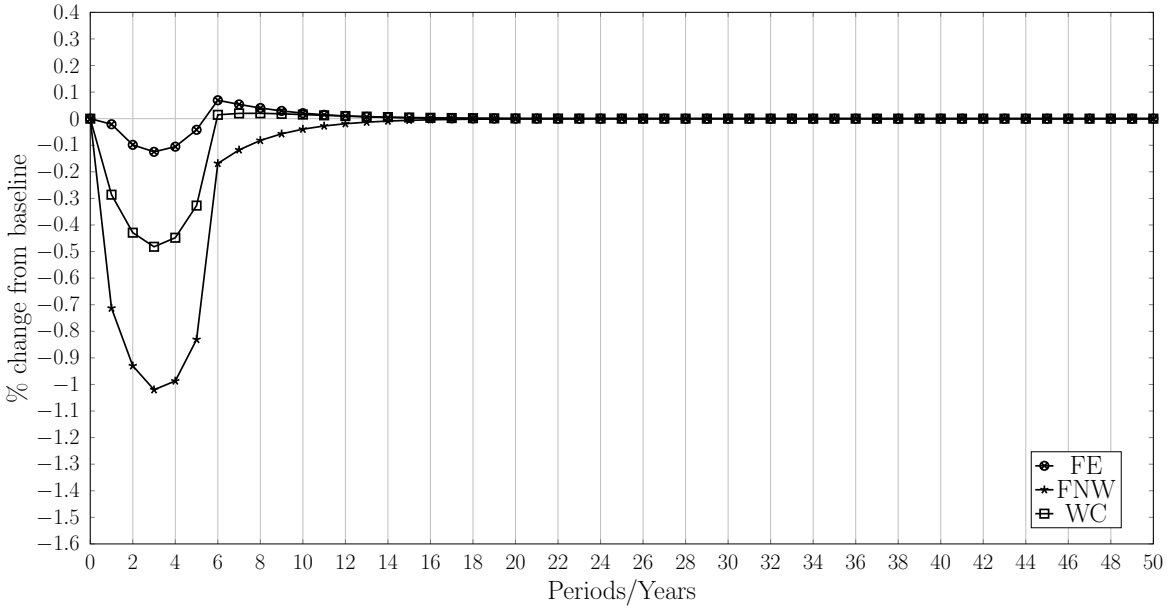


Figure A.2.8: Myopic: Period-by-period adjustment in GDP (labour market sensitivity)

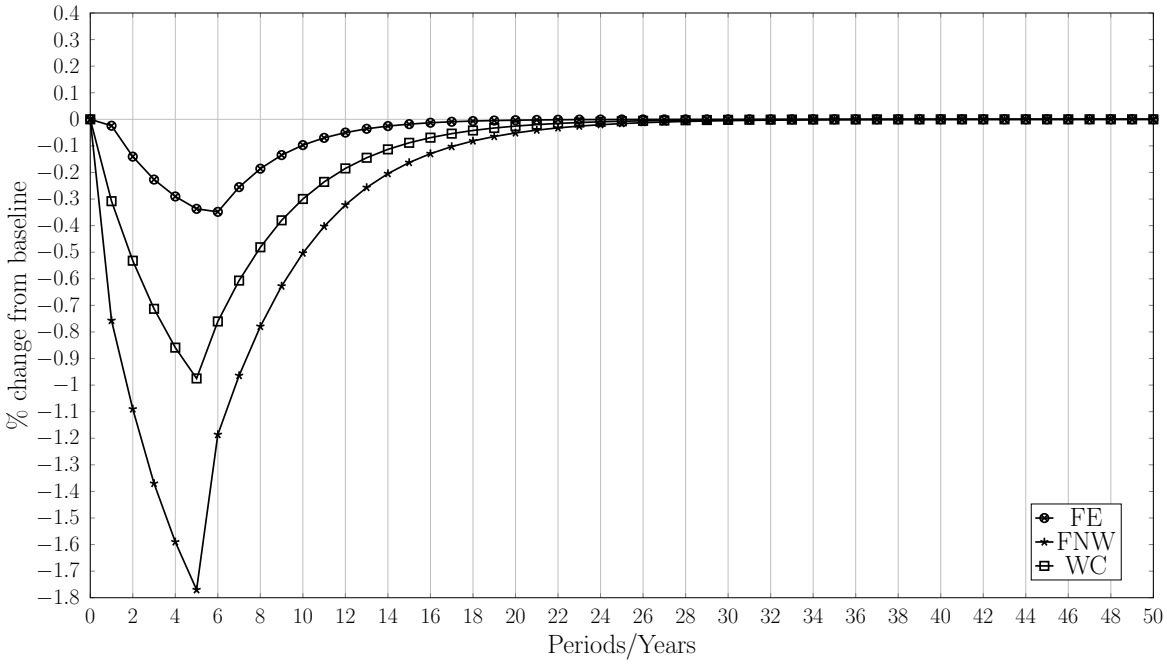


Figure A.2.9: Imperfect foresight: Period-by-period adjustment in GDP (labour market sensitivity)