Comparison of ADAM's Apr04, Apr08 and Dec09 model versions: first year effect

Resumé:

In this paper we compare the first year effects of a multiplier experiment in different model versions of ADAM. Most of the differences can be attributed to the difference in the level of service imports and relation for car consumption.
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Key word: multiplier experiment, first year effect

1. Introduction

The paper JNR241110 compares the multiplier effects of a public purchase experiment in the model versions – Apr08 and Dec09. It has been demonstrated that the crowding-out time in Dec09 model is longer than it is in Apr08 model. By swapping the central equations - wage, housing and macro-consumption - between the two model versions, the paper explains the difference in the crowding out time to a great extent. The paper, in general, focuses on medium to long term effects.

From a fiscal policy perspective, it is also interesting to compare the first (and maybe second to fifth) year(s) reactions of the different model versions to a certain policy intervention. Such a comparison requires looking beyond the differences in price elasticities in the different models, as prices hardly move in the immediate term. Quantity elasticities in contrast can be relevant. Here, the central equations will not be as important as they are in explaining the crowding-out time. In this paper, we try to compare the first year effect in the model versions Apr04, Apr08 and Dec09 through public purchase and interest rate experiment.

2. Multiplier experiment

Table 1 below reports the effects of two multiplier experiments on GDP at fixed price. The public purchase experiment increases public expenditure by 0.01% of GDP in current prices, and the interest rate experiment reduces all exogenous interest rates by 1%.[1]

Table 1. Multiplier effect on GDP, real growth in pct.

	Public purchase experiment			Interest rate experiment		
year	Apr04	Apr08	Dec09	Apr04	Apr08	Dec09
1	0.125	0.107	0.104	0.172	0.195	0.118
2	0.129	0.131	0.116	0.907	1.281	0.712
3	0.093	0.133	0.108	1.271	1.761	1.119
4	0.047	0.129	0.102	1.485	1.969	1.380
5	0.009	0.123	0.097	1.557	1.977	1.553

It is easy to see why both experiments boost GDP. In general, the effect is stronger in the earlier model versions (Apr04 and Apr08).

3. Explaining the difference

In reconciling the differences between the different model versions we consider Apr04 and Dec09, a similar analysis can be applied to Apr08 and Dec09.

The components of GDP at the aggregate level are an obvious point for starting investigation. Table 2 reports the effect of a public purchase experiment on GDP components and sub-components with significant difference in the two

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[1] The first period for all experiments is 2011

model versions. We can see that the effect on total supply, *fYst*, is approximately the same in the two models, but the effect is distributed differently between domestic production, *fY*, and imports, *fM*. The decomposition of imports shows that most of the difference is reflected on service imports. In 2005 imports and exports of services have been revised significantly, the grossfication in the national accounts. The public purchase experiment does not affect exports in the short term as export prices do not change. Imports, however, follow domestic activity and are increased in the short term.

Private consumption is the other component of GDP where we can see a significant difference, mostly coming from a difference in car consumption. The relation for car consumption in Dec09 does not exhibit much volatility compared to the relation in Apr04. In Apr04 model, Two-third of the change in private consumption comes from changes in car consumption, of which 50% is import of cars. In Dec09 model, the effect on car consumption and imports of cars is negligible. This implies almost all the effect on private consumption will be reflected on domestic production.

Table 2. Public purchase experiment, effect in real difference

year	fYst*	fY	fM	fCp	fMs	fCb	fM7b
			Apr04				
1	2466.5	1648.5	818.13	140.31	103.41	95.938	48.56
2	2715.0	1721.7	993.38	174.25	123.18	-6.855	21.08
			Dec09				
1	2486.75	1490.00	1035.75	68.38	359.70	17.36	17.80
2	2891.50	1697.13	1247.31	382.44	394.11	88.13	49.80

* fYst = (fY*py.1+fM*pm.1)/pyst.1

Whether the differences in car consumption and service imports matter or not can be explained by redoing both experiments with a small modification. This is done in two steps: first the multiplier experiments are carried out in the two models and the difference in the multipliers for the different import components and car consumption are calculated, second the j-parts for import components and car consumption in Dec09 are updated by the calculation from step one, and the multiplier experiments are re-run. The effect on GDP has increased from 0.104% to 0.118% in public purchase experiment and from 0.118% to 0.166% in interest rate experiment, see table 3. About 67% in public expenditure experiment and 90% in interest rate experiment is explained by the difference in imports and car consumption.

Table 3. Multiplier effect on GDP, real growth in pct.

	Public Purchase Experiment		Interest rate experiment	
year	Apr04	Dec09*	Apr04	Dec09*
1	0.125	0.118	0.172	0.166
2	0.129	0.129	0.907	0.721
3	0.093	0.122	1.271	1.124
4	0.047	0.116	1.485	1.386
5	0.009	0.111	1.557	1.560

*Dec09 model after updating imports and car consumption

4. Conclusion

Although we have been able to explain a significant amount of the difference, it does not mean this are the only differences. For example, the financial crisis of 2007 has altered the composition of production in favor of public production and consumption. Reduced share of private consumption and production in Dec09 will mean reduced swing in production and employment to a shock in public purchase or interest rate. A small difference in machinery and building investment is also observed.