

Referee's Report on

**Research into the Impact of Pigmeat imports on the
Australian Industry**

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B. The Impact of Pigmeat Imports on Australian Pigmeat Prices

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This study is a levels VAR analysis focusing on the effect of imports on domestic prices of pigmeat at various parts of the supply chain. The system includes retail prices of other meats, as well as feed grain price and exchange rates as exogenous factors.

1. Overview

The study appears to be quite well done, with a good application of the VAR methodology to specify and identify the model. I am not sure if the eight-variable model (plus three exogenous variables) comprises the set I would have used – for example, using three variables for prices of pigmeat products seems a bit unnecessary. In addition, including two bilateral exchange rates is not ideal either – some kind of import price might be more appropriate. But none of these concerns are likely to make much difference to the results.

2. Granger Causality

The comments above about Granger Causality apply here as well; the causality analysis fails to account for indirect causality, so we will not discuss these results further.

3. Impulse Response Functions

My major concern is with the use of impulse responses, which is the main tool used to describe the estimated impacts of various variables on others. The shock of interest is an increase in the volume of imports. Impulse response analysis allows us to consider the impact of a 1% increase in imports on domestic production and prices in particular. There is no problem with the application of this tool. The authors rightly acknowledge that it depends on ordering of the variables, and they try different choices for this; results are not sensitive to the ordering. The main problem appears to be a misunderstanding of how to interpret impulse responses. Figure 1 shows the results, which indicate that an increase in imports increases production in the short run (the authors seem to suggest a decrease, but an increase is clear from Figure 1), with no impact in the long run (after about 8 months). Likewise, prices drop initially, then return to their original levels after several months (8-12 months). Table 2 then shows “accumulated impulse responses” to this increase in imports. The authors interpret these to suggest that, for example, the “long run” impulse response of pork price is a 0.26% drop in pork price after a 1% increase in imports.

What is confusing here is that the impulse response (IRF) captures the effect of a one-off 1% shock to imports. Is this really what we want to consider? We do not know what this shock means in terms of long run effect on imports themselves. Does the impact of this shock die out immediately, meaning imports would return to their original (lower) level the next period? Probably not, but likewise, the shock is

unlikely have the “permanent” effect of lifting imports to a new, higher level which it maintains until the next shock. Most likely there will be some effect somewhere in between these two. It is the effect of this (unknown) adjustment in import levels which we are seeing in the graphs in Figure 1.

Let me illustrate with the two extreme cases, with a simple bivariate VAR.

Domestic price equation (eg):

$$Y_{1t} = \mu_1 + \alpha Y_{2t-1} + e_{1t}$$

Import equation:

$$Y_{2t} = \mu_2 + e_{2t}$$

The IRF measures the effect of e_{2t} taking a value equal to 1% of Y_{2t} on future values of Y_{1t} , assuming future values of $e_2 = 0$.

In this case, this means Y_{2t} will rise by 1%, and then Y_{2t+1} will return to the mean μ_2 . The IRF will show the effect of this temporary shock on Y_{1t} in subsequent periods.

Now suppose the imports equation is

$$Y_{2t} = \mu_2 + Y_{2t-1} + e_{2t}$$

Now when e_{2t} takes a non-zero value, Y_{2t} will be higher ($\mu_2 + e_{2t}$). In turn Y_{2t+1} will also equal $\mu_2 + e_{2t}$, as will all subsequent values. The IRF will show the effect of this permanent shock to Y_{2t} on Y_{1t} in subsequent periods.

The issue is that we do not know what a 1% shock means in terms of how much this means imports change by in subsequent periods, so we have no feel for how big its effect on domestic production on prices.

On a related issue, the accumulated effects are quite meaningless; they certainly do not tell us the “long run” effect of a one-off shock. That is given by the point to which the IRFs converge to, and this is typically close to zero (Figure 1).

One alternative approach might help deal with these issues. With the estimated model, we could run a simulation of the model with actual historical data on imports post-1999, and obtain fitted values of the prices and production. A simulation is then run with imports remaining at their low (say, 1999) levels, and the model’s fitted values for prices and production are obtained. The difference would be the model’s estimates of the effect of the actual historical growth in imports on these variables. Of course, variations with other levels of or movements in imports could be tried.

Despite the fact that we cannot draw any strong conclusions from the IRFs given in the paper, the results as they appear to show that shocks to imports do have some short run effects on prices (increased imports lower price) but these effects are not sustained – after 8-12 months there is no effect. Strangely, increased imports appear

to increase local production in the short run, with this effect also dying out after 8 months or so. If we believe imports crowd out local production, this effect is in the wrong direction. Perhaps instead the increase in both imports and in local production is in response to exogenous changes in demand which drive both variables up. Whatever the explanation, the effect also appears to die out quickly.

4. Cointegration

I will conclude with a brief remark about the cointegration analysis reported in Table A7. It is unusual to include a time trend in a cointegration equation, and it certainly makes it difficult to interpret the cointegrating relationship with the trend variable included. Furthermore, we do not actually see the estimated cointegrating vector: surely this is vital. If the two variables are cointegrated (subject to the comment about trend), then it makes a big difference whether they move in the same or opposite directions. Does increase in imports associated with increases in domestic production or decreases? From what we learned from the IRF above, I suspect the former, but cannot tell without the estimated vector.

5. Summary

It is difficult to draw any definitive conclusions from this study, because of the issues highlighted above. The results have potential to shed some interesting light on the questions of interest, but what is presented in the paper in its current version is ambiguous and not sufficiently informative. If a conclusion has to be drawn, it is that there are no long run effects of increasing imports on domestic production or prices. Short run effects are apparent, with increasing imports helping domestic production, and also leading to short run decreases in prices. However, I would prefer that the further analysis be undertaken before such conclusions were adopted with any great confidence.