The Impact of Pigmeat Imports on Australian Pigmeat Prices: A report prepared for
Australian Pork Limited, by S. Mounter and A. Wijeweera
(University of New England, February 2008)

<u>Referee's Report by Kalvinder Shields</u>
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This research report aims to investigate the impact of pigmeat imports on domestic prices of pig and pigmeat. The analysis is conducted within the Vector Autoregressive (VAR) framework, for the period 1990 to 2007, and uses appropriate econometric tools such as Granger causality tests, impulse response functions and variance decompositions to provide insights into predictability and the dynamic response of key variables to shocks over time. The key finding in this report is that an increase in the volume of pigmeat imports impacts negatively and significantly on both the contract and Sydney wholesale baconer price, as well as the domestic production of pigmeat.

There are a few comments that can be made with regard to the estimation methodology, strategy, approach and the interpretation of the results. These are as follows.

The VAR is an appropriate framework to investigate this question since the framework is general enough to accommodate a number of relationships between the variables which are driven by economic theory. The authors have been careful in constructing the VAR model, choosing an appropriate specification, conducting the analysis and interpreting the results.

The authors choose to model the variables in their (ln) levels form so that the specification of the cointegrating relationships can be embedded within the VAR model – and this is consistent with some of the econometric literature. However, in response to an earlier referee's comments, the authors have also tested for cointegration – and this is useful, since these relationships provide an insight into how

variables move together in the long run and hence provide information on the long run impact of one variable on another. Further, prior economic reasoning can be applied, and this will not only reduce uncertainty in the model specification, but will allow economically meaningful structure to be imposed on the atheoretic VAR.

However, the cointegration analysis seems to be incorrect. Cointegration cannot exist *between* any stationary variables, and neither can it exist between one stationary variable and one non-stationary variable. In the simplest case, for example, two series each of which are integrated of order 1 (i.e. non-stationary) are cointegrated if a linear combination of the series gives a stationary series (i.e. so that it is integrated of order zero). Hence, in terms of the results in section 9 of the paper, the data series LNBACON, LSBACON and LIMPO are stationary – and so it *does not* imply that a long run relationship exists between them. Further, the paper reports pigmeat imports to be stationary and the Australian production of pigmeat to be non-stationary. Again, cointegration cannot exist by definition between them. The finding from the Johansen tests implying that the null of no cointegration should be rejected suggests that both the cointegration tests or the ADF tests need to be checked again and for instance, other tests such as the Philip-Hansen tests for unit roots should also be used. (It is worth noting that the Johansen tests also have poor properties in small samples – and should be treated with caution in any case.)

In terms of implications for the overall results, the impulse response functions from the VAR analysis are still correct for the (unrestricted) model estimated. However, a little more care needs to be taken in interpreting the long run relationships between the variables, and distinguishing between the effects of shocks on stationary variables (on which the shocks have no long run impact) and the effects of shocks on non-stationary variables (on which shocks do have a long run impact).

Finally, a minor point to be made is that generalised impulse response functions could be used instead – but this is not a major concern and the authors have carried out sensitivity tests to the ordering of the variables in the VAR.