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Estimating the Social Welfare Effects of New Zealand Apple Imports

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Abstract

This paper provides a demonstration of how a comprehensive economic framework, which takes into account both the gains from trade and the costs of invasive species outbreaks, can inform decision-makers when making quarantine decisions. Using the theoretical framework developed in Cook and Fraser (2008) an empirical estimation is made of the economic welfare consequences for Australia of allowing quarantine-restricted trade in New Zealand apples to take place. The results suggest the returns to Australian society from importing New Zealand apples are likely to be negative. The price differential between the landed product with SPS measures in place and the autarkic price is insufficient to outweigh the increase in expected damage resulting from increased fire blight risk. As a consequence, this empirical analysis suggests the net benefits created by opening up this trade are marginal.

Outline

In many ways, the use of economic models in the analysis of market access requests represents a new innovation in policy research. In Australia, these models have only been used in a handful of cases, all dealing with long-standing, high profile cases. This is perhaps due to the fact that until recently quarantine has been considered solely an area of scientific interest. In modern times, with the coming into being of the World Trade Organisation (WTO) and an ever-increasing emphasis being placed on quantitative and semi-quantitative risk assessments, economics is set to play a key role in quarantine policy formulation and justification as a supplement to scientific methodology. With this in mind, this paper attempts to promote a definitive role for economic analysis and apply it to the much-talked-about case study of apples imported to Australia from New Zealand (NZ) growers.

The methodological basis of the paper is the theoretical approach developed in Cook and Fraser (2008) which, in considering a proposal to allow imports of a product,

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reconciles the benefits of trade in this product with the potential costs of an outbreak of invasive species as a consequence of the trade in this product.

This reconciliation is significant because import risk analyses (IRA) typically exclude the benefits of trade in favour of either quantitative or qualitative assessments of possible invasive species impacts. This is the case in most WTO Member countries, including Australia. Article 5 of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures, commonly referred to as the SPS Agreement, identifies the factors considered paramount from a WTO perspective in assessing the extent of quarantine risks. But a conspicuous omission from this list of relevant factors is *consumer gains from trade*. This becomes highly important when attempting to use measures of societal welfare to examine the impact of market access requests because consumers constitute a large proportion of society.

In particular, if the economic benefits of importation can be clearly demonstrated to be above and beyond the quantifiable increase in pest damage risk, trade will result in a net gain to society. This being the case, the prohibition of these imports is effectively costing society. However, if the benefits of importing are insufficient to offset increased risk of pest damage, prohibition is justified on the grounds that it will prevent a net social welfare loss (Cook and Fraser 2008).

It should be recognised that the issue of importing New Zealand apples into Australia, and the analysis of this issue, has considerable history to it. Specifically, Hinchy and Low (1990) addressed a New Zealand request made in 1989 to import apples into Australia, where the major disease transference concern was (and remains) fire blight. Fire blight is a disease caused by the bacteria *Erwinia amylovora* that affects plants from the family *Rosaceae*, including apples and pears. Once established the bacteria can not be eliminated from an orchard, but costly measures such as an aggressive pruning regime can be taken to limit the extent of infection (Buckner 1995). The disease originated in the United States, but has spread to most apple growing areas of the world with the exception of Australia[1]. It was first discovered in New Zealand in 1919, and apples have been refused entry to Australia since 1921 (BA 2004).

Australia's detailed response to NZ's 1989 request, coordinated by the Australian Quarantine and Inspection Service (AQIS), was partly motivated by the so-called 'Lindsay Review' of Australian quarantine (DPIE 1988) that recommended moves away from 'zero risk' policies towards 'acceptable' quarantine risk. The economic component provided by Hinchy and Low (1990) was accompanied by a biological component, Roberts (1991)[2]. The former took the form of a benefit cost analysis comparing the expected consumer and producer surplus changes resulting from relaxing quarantine laws protecting the apple industry. In 1995 New Zealand made another request to access the Australian apple market. This time the economic analysis came in the form of Bhati and Rees (1996), which was quite different in approach to that of Hinchy and Low (1990). Expected consumer surplus change is not discussed. The analysis only considers possible producer surplus losses to pome

[1] The likelihood of fire blight establishment in Australia has recently been shown to be very high using self organising map (SOM) analysis, which is a type of artificial neural network. This technique uses worldwide species associations to determine which species have the highest likelihood of establishing (Worner and Gevrey 2006). A SOM analysis was performed on the worldwide distribution of 131 bacterial pathogens (CABI/EPPO 2003), of which 71 are currently absent from Australia. The analysis ranked fire blight 17th in this list (Paini et al. in press).

[2] A theoretical discussion of the techniques used in this analysis appears in Hinchy and Fisher (1991).

fruit growers if a fire blight outbreak were to occur[3]. Both import access requests were denied. Viljoen *et al.* (1997) presents evidence that the import ban was indeed justified given that the pear industry in Australia could collapse in the event of a fire blight outbreak.

NZ again submitted an application to Australia to access the apple market in 1999 in which it asked specifically for management procedures that might be applied in order to reduce the risk of biological contamination below Australia's Appropriate Level of Protection (ALOP). Following the release of a draft IRA in February 2004 which recommended that market access be granted subject to strict pre-entry quarantine measures, mistakes were identified in the spreadsheet models used to ascertain the risks associated with certain pests. When these mistakes were corrected and the final IRA released in late 2006 market access was still deemed to present a sub-ALOP level of risk, but only if an even more stringent set of SPS measures were applied. These restrictions were considered by NZ to be inconsistent with Australia's obligations under the SPS Agreement, and in early 2007 requested consultations with Australia using the WTO's Dispute Settlement Process (DSP). Subsequently, the European Union, United States requested to join the consultations. Despite the DSP initially targeting a completion date of June 2009, at the time of writing the dispute remains unresolved.

Given this controversial background, this paper applies the methodology of Cook and Fraser (2008), which represents a coherent economic framework of analysis of such trade decisions, to the empirical context of importing New Zealand apples with the aim of evaluating the social welfare consequences of allowing this trade.

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[3] Like Hinchy and Low (1990), Bhati and Rees (1996) base their assumptions about the impact of the fire blight disease on the information contained in Roberts (1991).

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