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Distinguished Fellow of the Economic Society of Australia, 2008: Alan Woodland

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Abstract

This citation acknowledges Professor Alan Woodland as an eminent Australian economist and surveys his exceptional international record of scholarship and research with a selection of his insightful contributions to the understanding of the complex issues of international trade, taxation and welfare. These issues are at the forefront of our nation's economic priorities and it is appropriate that we formally recognise his outstanding contributions to the discipline study of economics with the award of Distinguished Fellow of the Economic Society of Australia.

Keywords

society, australia, alan, fellow, woodland, economic, 2008, distinguished, ERA2015

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Distinguished Fellow of the Economic Society of Australia, 2008:
Alan Woodland

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This citation acknowledges Professor Alan Woodland as an eminent Australian economist and surveys his exceptional international record of scholarship and research with a selection of his insightful contributions to the understanding of the complex issues of international trade, taxation and welfare. These issues are at the forefront of our nation's economic priorities and it is appropriate that we formally recognise his outstanding contributions to the discipline study of economics with the award of Distinguished Fellow of the Economic Society of Australia.

I   Introduction

Professor Alan Woodland started his distinguished academic career at the University of New England.[2] He graduated with a Bachelor of Arts with Honours in 1965 and lectured there until the completion of his PhD in 1969. Alan then moved to the University of British Columbia in Canada starting as an Assistant Professor in 1969 and progressing quickly to Associate Professor and then Professor of Economics in 1978. In 1982 he returned to Australia, taking the position at the University of Sydney of Professor of Economic Statistics and then Professor of Econometrics in 1984. Alan's outstanding research was recognised by the Australian Research Council with the awarding of a prestigious Australian Professorial Fellowship in 2002, a position which he currently holds. Reflecting the progression of his research interests, Alan was recently appointed as a Scientia Professor by the University of New South Wales, which is one of the highest accolades awarded by the university.

Alan's main research interests can be grouped into three related fields. The first is applied econometrics and econometric modelling, including the analysis of household behaviour, the allocation of time and the effects of taxation and subsidies. The second field of research covers international trade theory and policy reforms in multilateral contexts, in particular, analysing possible Pareto improving changes to international transfers, tariffs, taxes and trade quotas under the redistributive effects of income transfers and commodity taxation. The third research field remains in this international trade and welfare context but provides a more explicit treatment of time with the theoretical modelling of endogenous strategic behaviour and intertemporal adjustments and policy considerations.[3] A selection of Alan's original contributions will now be considered in more detail.

II   Selected Key Research Publications

Alan Woodland has published five research monographs and more than sixty journal papers. These publications include top tier journals such as *Econometrica*, *American Journal*

of Agricultural Economics, Review of Economic Studies, *Journal of International Economics*, *Canadian Journal of Economics*, *Journal of Econometrics*, *Journal of Environmental Economics and Management*, *Economics Letters*, *Applied Economics*, *Journal of Development Economics*, *Economica*, *The Economic Record*, *European Economic Review*, *Journal of Public Economics*, *Oxford Economic Papers* and *International Economic Review*. All of these journals are ranked in the top twenty percent of journals and the great majority included here are ranked in the top five percent.[4] It is also interesting to observe that around eighty percent of all of Alan's publications are in economics journals.

The overriding characteristic of this research is the critical analysis of major economic issues by conceptualising the problem in a relevant theoretical framework and analysing the issue to provide insights into suitable policy prescriptions which have important economic, social and political implications. This research methodology, soundly ground in theory, compares with the frequently observed mechanical exploitation of known theory and estimation techniques to one more application. Alan's research does not merely apply existing techniques, rather it has contributed significantly to our understanding of important issues.

Given the relatively large number of technical articles, which cover a range of related issues, a survey will effectively only provide an overview of these contributions. Rather, it is sensible to review a selection of key journal publications to make clear the chronological development and the overriding theme of the three related fields of research.[5] But before we start, let us separately consider the seminal article:
Diewert and Woodland (1977), 'Frank Night's Theorem in Linear Programming Revisited', *Econometrica*.

This paper provides a relatively simple algorithm to compute the complex equilibrium outputs and domestic resource prices for a representative country, subject to domestic resource constraints and given exogenous international prices. It generalises Samuelson's extension of Knight to allow for a general technology, including joint and intermediate products and a number of industries with multiple inputs and outputs.

Written over three decades ago, this is a remarkable paper because it simplifies the problem through the use of duality theory to reduce the dimensionality of the profit maximisation problem.[6] This provides tractable analysis of complicated comparative statics, which are shown to generalise important theorems of international trade theory. The elegant analysis significantly develops existing theory and provides important policy insights.

It also provides the framework for the three fields of Alan's research which will be used as the basis of the review. The first field relates to the analysis of labour supplies and consumer demands using applied econometric modelling, published in the late 1970s and early 1980s. The article also allows simulations of the production sector of a small open economy subject to changes in tariffs, world prices or endowments. This also sets the stage for the subsequent second field of research interest on the comparative static analysis of international trade theory and policy, published from the late 1980s. Another important contribution of this article is the alternate modelling of a multiplant located firm where the domestic resource prices can be interpreted as profit maximising transfer prices which may not have competitive market prices. The social price interpretation relates to the later research reported in the 2000s. Each of these fields will now be surveyed.

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[4] According to the Australian Business Deans Committee (ABDC) ranking for economics journals in the *A** and *A* categories.

[5] The articles were selected with the helpful advise of Dr Mark Melatos from those articles identified in Alan Woodland's Fellow profile on the Academy of Social Sciences in Australia site: <www.assa.edu.au/fellows>.

[6] The simplification is due to the industry unit profit functions already embodying the results of industry profit maximization (cost minimisation) which does not require additional equations in the maximisation problem.

(i)   *Applied Econometric Modelling*

The optimum allocation of labour resources is analysed in the article: Wales and Woodland (1977), 'Estimation of the Allocation of Time for Work, Leisure and Housework', *Econometrica*. Whilst existing studies included utility maximisation in the theoretical derivation of the labour supply curves, many did not carry this through with *ad-hoc* empirical estimation. Of the studies that estimated an explicitly derived labour supply curve from utility maximisation, they did not distinguish housework from leisure. The contribution of the article is the formulation of a model where a household allocates time between job-work, housework and leisure. The stochastic specification of the model is estimated using US panel income data and the results show that ignoring housework considerably affects the estimates of the labour supply responses. Endogenising the hours used for housework shows that housework between husband and wife is responsive to their relative wages. For families without children, housework is negatively related to income whilst it is not for families with children.

The second paper considers in more detail the consequences of a progressive income tax. A model of labour supply based on utility maximization subject to a budget constraint is given in: Wales and Woodland (1979), 'Labour Supply and Progressive Taxes', *Review of Economic Studies*. The presence of a progressive income tax implies the after-tax wage rate will be endogenous. This is because the household's utility maximisation allocation of work determines the tax bracket and, therefore the marginal tax rate.[7] Other studies approximate the piecewise linear budget constraint as a straight line through the individual's observed leisure and consumption choice, such that the observed marginal wage rate is the opportunity cost of leisure. However in the presence of stochastic disturbances there will also be mispecification. The suggested full information estimation method which incorporates the piecewise linear budget constraint overcomes these problems. US panel income data is used to show the specification error associated with the linear approximation model gives substantially biased parameter estimates compared to the full information method.

The article addresses an important issue by developing a new estimation method which can be used to benchmark the estimation bias in other studies. The policy implications are obvious and interestingly the technique has other applications. For example it can be used to model labour supply of individuals who can work at different wage rates. A piecewise budget constraint is also applicable for demands for utilities like electricity and water where the price depends upon the quantity purchased. Importantly the literature on estimation of electricity demand did not adequately cater for the specification problems associated with endogenous block pricing. The procedure presented here is an appropriate estimating procedure for these types of cases.

The analysis of consumer demand is considered in the paper when the survey data of household expenditures contains a relatively high proportion of observations where consumption is zero: Wales and Woodland (1983), 'Estimation of Consumer Demand Systems with Binding Non-negativity Constraints', *Journal of Econometrics*. In this case the usual estimation of consumer demand systems is inappropriate because these procedures assume that expenditures follow a joint normal distribution which does not allow for a positive probability of zero expenditures. The parameter estimates will be inconsistent and the common practice of excluding these observations will not only reduce the sample size but provide biased and inconsistent estimates.

This problem stems from the previous experience of using the US household income data to estimate labour supply. The maximisation of utility with consumption and work for

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7   This is assumed away in the preceding article because it used United States tax data which is characterised by relatively wide tax brackets.

husbands and wives had the associated problem of an observed significant proportion of wives not working.

The article develops a model based on the Kuhn-Tucker conditions for utility maximisation subject to the budget and non-negative constraints. This does not require the arbitrary assumption used in empirical estimation of allowing for zero expenditures in the form of the truncated distribution of random disturbances. This is an important and non-trivial extension of existing procedures. It is shown that the maximization of the likelihood function for the model yields consistent and asymptotically efficient parameter estimates, which are normally distributed.

(ii)   *Comparative Static Analysis of Multilateral Trade and Policy Reforms*

Whilst the analysis in this section is characterised as piecemeal, it is argued that it presents a realistic policy environment. Governments are unable, or unwilling, to make large discrete policy changes required to achieve first-best welfare outcomes and therefore prefer piecemeal trade policy reforms. The first paper investigates the issue of tariff reform in a small open economy: Diewert, Turunen-Red and Woodland (1989), 'Productivity- and Pareto-improving Changes in Taxes and Tariffs', *Review of Economic Studies*. It is assumed for the multi-household economy that the government can only rely on tariffs and domestic commodity taxes as policy instruments. The reason for this assumption is that commodity taxes are politically feasible whilst lump sum transfer instruments are seldom used in practice.

The general equilibrium model with government is solved to derive the possible gains from trade which arise from the restructuring of the production sector. This convenient concept of a productivity improving tariffs and taxes is used to establish the relatively mild conditions for the existence of Pareto improving tariffs and domestic taxes. Conditions are established for particular tariff reforms, such as proportional reductions and reductions of extreme rates, to yield Pareto improvements in welfare.

Extensions of the gains from trade in a multilateral setting are considered in the following two papers. The first paper develops a general model which allows the identification of the conditions which lead to Pareto improving multilateral trade reform-policy: Turunen-Red and Woodland (1991), 'Strict Pareto-improving Multilateral Reforms of Tariffs', *Econometrica*. The other paper considers this in terms of quantity restrictions on trade: Turunen-Red and Woodland (2000), 'Multilateral Policy Reforms and Quantity Restrictions on Trade', *Journal of International Economics*.

Both papers develop a model of a multiple number of nations involved in international trade in a number of commodities. The first paper derives necessary and sufficient conditions for multilateral tariff reforms, with international transfers of income, which obtain Pareto improvement in welfare. The analysis is then applied to specific trade policies such as a proportional reduction in tariffs. The importance of this paper is that it extends the generality of previously obtained results in the literature and proposes some new tariff reforms.

The second paper extends this multiple nations and commodities trade analysis to consider the role of quotas. Conditions for the existence of Pareto improving multilateral reforms of quotas are identified. The analysis is extended to determine the required reforms to tariffs which achieve the required redistributions without lump sum compensations.

Whilst the multiple country and commodities general equilibrium model has been used to analyse multilateral tariff reforms, non-preferential trading arrangements by a group of countries is considered by: Raimondos-Møller and Woodland (2006), 'Non-preferential Trading Clubs', *Journal of International Economics*. This article provides a theoretical basis for the 'open regionalism' debate, which compares with the preferential trading arrangements literature. The contribution establishes the necessary and sufficient conditions for a Pareto improvement in the member group countries. The non-discriminatory tariffs of members are

coordinated with income transfers in order to reduce the trade distortions of members. Importantly, these actions are designed to improve resource allocation within the club whilst not affecting world prices and trade between the club and non-members.

(iii)   *Intertemporal Analysis and Strategic Endogenous Behaviour*

The third research field continues in the international trade and welfare context but provides a more explicit treatment of time with the theoretical modelling of endogenous strategic behaviour, intertemporal adjustments and policy considerations. Given the observed increasing preference for preferential trading arrangements, the first article uses cooperative game theory to investigate how coalitions may form endogenously: Melatos and Woodland (2007), 'Endogenous Trade Block Formation in an Asymmetric World', *European Economic Review*. The paper provides additional insights into the popularity of free trade areas compared to custom unions. The model simulations show free trade will occur when all countries have similar endowments and preferences. However custom unions tend to form between countries when preferences or endowments diverge internationally. Nevertheless, the blocking of free trade gives way to free trade areas if the asymmetry further increases. This clearly demonstrates for the first time that free trade areas may Pareto dominate custom unions in a perfectly competitive environment.

The choice of trade taxes and income transfers (in the form of aid) are also examined in a game theoretic model with non-cooperative strategic behaviour by participants: Lahiri, Raimondos-Møller, Wong and Woodland (2002), 'Optimal Foreign Aid and Tariffs', *Journal of Development Economics*. The analysis demonstrates the timing of the actions of foreign aid transfers and tariff setting are important and in the case where aid is given first then the recipient country will subsequently reduce the optimal trade tax. If a donor country ties the aid to a reduction in the recipient county's tariffs then the optimum aid transfers are determined which provide a Pareto efficient outcome for both countries, without the need for multilateral trade liberalisation.

The third paper further considers a country's strategy to tie aid to another important and topical policy issue, namely the reduction of pollution: Schweinberger and Woodland (2006), 'The Short and Long Run Effects of Tied Foreign Aid on Pollution Abatement, Pollution and Employment', *Journal of Environmental Economics and Management*. In contrast to the prevailing view in the literature, the analysis shows that aid tied to pollution abatement will actually increase pollution. This view is important because of the observed preference of donor countries to tie foreign aid to identified conditions including emissions. Time is again important in the analysis in that there will be crowding out of private sector pollution abatement in the short run. In the long run, in the absence of private pollution abatement policies, aid will endogenously increase labour employment and production in the cross border recipient country, which will in turn increase pollution. The model is very relevant to the study of Western European countries policies to tie aid to emissions reductions and the employment effects on Eastern European countries.

The possible endogenous response of labour is continued in the following novel analysis of illegal cross border migration: Woodland and Yoshida (2006), 'Risk Preference, Immigration Policy and Illegal Immigration', *Journal of Development Economics*. The unique contribution of this paper is the explicit modelling of attitudes to risk in the prospective illegal immigrant workers. In contrast to the existing literature, which assumes risk neutrality, allowing for varying risk preferences in light of possible detection and punishment derives possible multiple and unstable equilibria. The two-country model of risky illegal immigration with a probability of detection, solves for expected utility to derive the wage differential between the labour scarce home country and the foreign country. Unlike the risk neutral case, there may be more than one equilibrium and time therefore becomes important. Assuming dynamic continuous adjustment of wages with relatively slowly

adjusting immigration allows possible instability. Interestingly, this is a function of attitudes towards risk (not necessarily risk loving behaviour) and the probability of being caught. Subsets of the extended model conform with the findings of empirical studies.

This completes the circle by bringing us back to the focus of labour supply in the first field of research. Despite the wide coverage of a range of important, related issues, there is a continuing theme throughout this review. It is Alan's considerable ability to identify new important issues, to succinctly present new ideas by developing models and research practices, which have important consequences for policy formulation. This research contributes to our knowledge by providing research frameworks which provide relevant, original and effective policy prescriptions to the major issues.

III   Acknowledgement, Professional Activities and Awards

The response to Alan's impressive research record is indicated by high citation and download rates according to the Social Science Citation Index. This is also true for Alan's advanced textbook: Woodland (1982), *International Trade and Resource Allocation*, *Advanced Textbooks in Economics*, Vol. 19, North-Holland. The review by Svensson (1984), claims the book "... is a thorough, comprehensive and elegant presentation of modern trade theory" (p.383) and "... the overall impression the book makes is extremely good. It is indeed an excellent presentation of modern competitive trade theory, and it should become an indispensable advanced reference and textbook for the student, teacher, and researcher in the field of international trade" (p.386).[8] Although published in 1982 it is still relevant for today and has been used as a major reference over recent years in a number of universities.[9]

Another measure of recognition includes the many prestigious competitive research grants, totalling more than $4.5m that Alan has successfully applied for. He has received research funds from the *Social Sciences and Humanities Research Council of Canada* (1978, 1981 and 1984), the *Bureau of Labour Market Research* (1984), the *Australian Research Council* (*ARC*) (1984-1988, 1990-1992, 1994-1996[10]), *ARC Small Grants* (1994-1995, 1998-1999, 2000), *ARC Discovery Project Grants* (2002-2004[11], 2002-2006, *ARC Linkage Project Grants* (2002-2004[12], 2007-2010[13]), *ARC* and *NHMRC Strategic Awards Initiatives* (2007-2011[14]), and an *ARC Discovery Project* Grant (2008-2012).

Alan Woodland has also given significant professional service to the economics and econometrics disciplines. He has been Editor of *The Economic Record*, is currently Associate Editor of the *Review of International Economics*, and is a member of the editorial boards of *The Economic Record*, The *BE Journals of Economic Analysis and Policy, Empirical Economics*, and the *International Journal of Economic Theory*. He has been a member of the editorial board for *Economic Analysis and Policy*, *International Tax and Public Finance* and the *Journal of Applied Econometrics*.

In terms of the learned societies, Alan has been Chair and member of the Australasian Standing Committee of the Econometric Society (the international organisation) for over twenty years, until recently, and has served as a member of the Council of the Econometric Society for several terms. He has served two terms on the Executive of the International

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[8] Svensson, L.E.O. (1984), 'Book Reviews', *Journal of International Economics*, 17, 383-386.
[9] For example the University of Minnesota.
[10] With R. Bartels and D. Fiebig.
[11] With E. Appelbaum.
[12] Including one APAI Award, with G. Barrett, J. Piggott and industry partner, Commonwealth Department of Family & Community Services.
[13] Including two APAI Awards with G. Barrett, R. Gregory, J. Piggott and Industry Partner, Commonwealth Department of Families, Community Services and Indigenous Affairs.
[14] With J. Piggott, P. Bohle, P. McDonald and C. Choi.

Economics Association in the 1990s and has been a member of the Central Council of the Economic Society of Australia from 1980 to 1992. Other associations include member of the Scientific Committee of the European Trade Study Group, Board Member of the Asia Pacific Trade Seminars, and Academic Council Member of the DEGIT Research Centre.

Alan has received recognition of his outstanding research with the appointment of Professorial Associate at the Centre for Pensions and Superannuation, University of New South Wales since 2002. He was a Member of the Australian Research Council's College of Experts for the Social, Behavioural and Economic Sciences, 2004-2006 and was appointed in 2007 by the Minister for Education, Science and Training to the Economics, Commerce and Management panel for the Research Quality Framework (RQF) assessment program of the Department of Education Science and Training.

Alan has recently been appointed as a Scientia Professor at the University of New South Wales which is one of the highest accolades awarded by the university. The Dean of the Australian School of Business claims "Professor Woodland's appointment as a Scientia Professor recognises his exceptional scholarly contributions over many years and his prestigious international standing. It also recognises the distinction of his ongoing research program."[15] Indeed, it is his more recent focus on tariffs and custom unions affects on dynamic trade and growth and the sustainability of changes to superannuation in an aging society which we can look forward to.

Alan Woodland has received many national and international awards and distinctions, including a Canada Council Leave Fellowship in 1974-75 and a Reserve Bank Fellowship in Economic Policy in 1981. He held a Senior Fulbright Fellowship in 1993, has been a Fellow of the Academy of the Social Sciences of Australia since 1985 and was appointed a Fellow of the Econometric Society in 1988. He has also been awarded with the prestigious Australian Professorial Fellowship (APF) for the periods 2002-2006 and 2008-2012.

IV   Conclusion

This citation acknowledges Professor Alan Woodland as an eminent Australian economist with an exceptional international record of scholarship and research. The survey demonstrates he has made an outstanding contribution to the understanding of complex issues which are at the forefront of our nation's economic priorities, including international trade, taxation and welfare.

Alan has also given significant service to the economics profession in the form of leadership of professional bodies and editorial responsibilities over a sustained period of time. Alan is one of only four living Australians who are both Fellows of the Econometric Society and the Academy of Social Sciences of Australia.

It is appropriate that we formally recognise in Australia, Professor Alan Woodland's eminent contribution to the discipline study of economics. Alan rightly deserves the award of Distinguished Fellow of the Economic Society of Australia.

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[15]   Professor Alex Cameron, Dean of the Australian School of Business, University of New South Wales, <www.fce.unsw.edu.au/LatestNews_ProfAlanWoodlandappointedScientiaProf>.

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