

## IMMIGRATION AND TRADE: HOW IMPORTANT IS THE LINK? EVIDENCE FROM AUSTRALIA

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### 1. INTRODUCTION

Immigration can benefit a country in many ways. It can affect the demand side of an economy through multiplier effects resulting from the immigrant's own spending on food, housing, leisure activities, business investment, and through the expansion of government services such as health care, education and welfare. It also affects the supply side of the economy through labour, skills and money introduced into the home country; new businesses developed by the immigrants; immigrant contributions to technology; and adding productive diversity through knowledge of international business markets (DIMIA, 2001a).

Australia, with a substantial immigrant population, is a country in which immigration has the potential to influence trade. Between 1961 and 2001 Australia's exports increased from AUS\$1,937,686 to AUS\$119,559,378, and its imports from AUS\$2,175,154 to AUS\$118,257,352 (DFAT, various issues). At the same time Australia's trading partners were steadily diversifying. Until the 1950s Europe acted as Australia's most important trading partner, however, Europe's dominance gradually declined over the second half of the twentieth century while that of the dynamic Asia Pacific region increased dramatically.

Of all the economic benefits that may result from immigration, its impact on the host country's current account has drawn most attention from scholars and policymakers. Interestingly, immigration appears both as a "hero" and a "villain" in the literature: hero if its influence on exports is stronger than its influence on imports; villain if it creates more demand for imports than its contribution to the expansion of exports.

By application of a simple accounting framework earlier studies on the impact of immigration on Australia's trade portrayed immigration as a villain for contributing to deterioration of the current account through an increase in demand for imports, decrease in exports (via increase in domestic consumption of exportable products) and an increase in investment demand (Karmel 1953, Corden 1955, Kmenta 1966, Duloy 1967, Brain 1979, Dixon *et al.*, 1982, Lloyd 1982, Stammer 1982, Norman and Meikle 1985, Birrell 1987, Carmicheal and Dews 1987, Baker 1988, Bills 1988, CAAIP 1988, Joske 1989, Argy 1990).

Studies based on other techniques indicate that the net impact of immigration on the current account balance can be negative, positive or inconclusive. For example, Kmenta's (1966) analysis of the effect of immigration on the Australian economy over the period 1948 to 1961 led him to conclude that immigration leads to an increased demand for fixed capital equipment and imports, and that demand for imports outstrips the demand for fixed capital equipment. He therefore concluded that in Australia's case immigration had a subduing effect on the economy.

Brain's (1979) study on the effect of 100,000 newly arrived immigrants on the economy over two years, suggested that immigration has a greater impact on the level of imports than on exports, thus adversely contributing to the trade balance.

A study by the Centre for International Economics in 1990 observed that the short run economic effect of immigration was to increase labour supply, thereby lowering wages and production costs. This led to lower prices and consequently reduced imports and increased exports. These findings suggest that the medium term effect of the immigrant population is characterised by an increase in investment and worsening of the current account, although, in the long run it was predicted to drift back to equilibrium. Similarly, Wooden *et al.* (1990) argue that under fixed exchange rates, immigration causes the balance of payments to deteriorate. Conversely, under floating exchange rates, immigration leads to a depreciation of the exchange rate and therefore an increase in export levels and a decrease in import levels.

Foster's (1992) analysis of Australian immigration policy over the period of 1991/1992 to 1999/2000 found that a reduction in immigration would bring about a fall in both exports and imports - the fall in imports being less than the fall in exports - although exports were still growing at a faster rate overall. However, he concluded that the effects were small - the macroeconomic effects of such changes in immigration policy should not therefore be the focus of the policy. Junankar *et al.* (1994) used the Granger causality tests to investigate the trade and immigration links by considering 7 countries (France, Germany, Japan, New Zealand, South Korea, the UK and the US). They found that in the long run, net migration reduces exports, increases imports and either worsens the current account or leaves the balance unaffected. Gould (1994) employed the gravity model to study United States' bilateral trade with 47 countries and found a positive relationship between immigration and trade. However, he observes that in the case of the US, exports are more strongly influenced by immigration than imports. Gliberman (1995) questions the empirical strength of the relationship between immigration and trade and points out that Canada's trade shares failed to increase with its two principle sources of new immigrants - Hong Kong and India. Head and Ries (1998) also employed the gravity model for examining the link between trade and immigration using Canadian trade data with its 136 partners from 1980 to 1992. Their findings suggest that a 10% increase in immigrants is associated with a 1% increase in Canadian exports to the immigrants' home country and a 3% increase in imports. The findings of Dunlevy and Hutchinson (1999) also indicate pro-trade effects of immigration on US imports in the late nineteenth and early twentieth centuries.

The most recent literature on links between trade and immigration suggests that immigrants may serve to link their home and host countries in three main ways: by creating import markets for the finished and manufactured goods to satisfy their traditional taste; by disseminating information on the trade of products between the home and host countries based on cost differentials and product differentiations; and by reducing the transaction costs through the use of ethnic networks (Fawcett 1989, Rauch 1991, 1996, 1996a, Landa 1994, Dunlevy and Hutchinson 1996 and 1999, Girma and Zhihao 2000 and Hutchinson, 2001). A number of studies (Nelson 1959, Greenwood 1968, Dunlevy and Gemery 1977 and Massey 1993) also suggest that these three links parallel the links between earlier migration and later migration (known as "chain migration" or the "family and friend effect"). It is argued, "earlier settler immigrants simultaneously promote a greater flow of traded goods and a greater flow of new immigrants" (Dunlevy and Hutchinson, 1999, p1045). Moreover, subject to the availability of a minimum critical mass, immigrants tend to induce domestic production of goods that were previously being imported from their home country.

The main objective of this paper is to empirically examine the relationship between immigration and trade flows in Australia over the period 1961 to 2001 by employing a revised gravity model. The relationship between these two factors is attributed to immigrants'

better knowledge of their home markets, and having a preference for some goods produced in their home markets because of cultural or other reasons. The theoretical foundation and the empirical evidence of links between trade and immigration, changes in volume and direction of Australian trade and change in volume and sources of migration during the last 40 years of the twentieth century, motivated the author to take the initiative for this study.

The paper is divided into 5 main sections. The next section briefly examines the change in direction of Australian trade and its principal sources of immigrant population over the past four decades with a view to assessing the importance of various regions as both a source and destination of Australian trade and migration. Sections 3 and 4 deal respectively with the methodology employed in this study and the results achieved. As usual, the final section of the paper deals with conclusions.

## **2. THE DYNAMICS OF AUSTRALIAN TRADE AND IMMIGRATION**

### **2.1. CHANGES IN THE SOURCES OF AUSTRALIAN IMMIGRANT POPULATION**

Prior to Federation, the Australian states each had their own migration programmes, competing for the immigrants who came to Australia. However, post-Federation immigration was considered to be the responsibility of the Federal Government. Policy was directed mainly at attracting European settlers. The ‘White Australia Policy’ of 1901, which was widely accepted by the community, limited the influx of non-European settlers through such measures as a dictation test which could be in any European language, and not necessarily in a language that the immigrant was familiar with (DIMIA, 2000, p1). Another policy aimed at restricting the influx of non-European immigrants was the Naturalisation Act of 1903, under which persons from Asian, African and Pacific Island countries, excluding New Zealand, could not be naturalised in Australia (DIMIA, 2000, p1).

The establishment of the Department of Immigration in 1945 led to the development of the country’s first national migration programs<sup>1</sup>. These were targeted to increase Australia’s population by 1% per annum (DIMIA, 2000, p1). The first non-European immigration policy amendments were made in 1947 when non-Europeans who had entered for business reasons and had stayed for over 15 years were allowed to stay without reapplying for temporary permits. Between 1948 and 1952, the Displaced Persons Schemes brought in 170,000 people. The next policy move towards the acceptance of non-European immigrants was in 1952 with the entry of 800 non-European refugees and the Japanese wives of Australian servicemen (DIMIA, 2000, p5). By 1972 the ‘White Australia Policy’ was being dismantled, and the focus of immigration policy centered on its effect on the economy and employment and on social support instead of whether or not the applicant was European (DIMIA, 2000, p8). The effects of these policy changes are reflected in Table 1, where in proportion of immigration from major source countries over the last 40 years are shown. There has been a clear shift away from European countries towards countries in the South and Southeast Asia. In 1961 there were no Asia Pacific countries amongst Australia’s top sources of immigrants (excluding New Zealand); in 2001, four countries (Vietnam, China, the Philippines and India were 4<sup>th</sup>, 5<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> respectively). Countries in the Asia Pacific region are now among the top ten suppliers of Australia’s immigrants.

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<sup>1</sup> As is well known, the Australian colonies had their own programmes in the 19<sup>th</sup> century. In the 1920s there were also State Schemes such as those under the banner of Empire Settlement.

In addition to the shifts in policy relating to the sources of immigrants, the government also regulated numbers depending on priorities and needs of the country. The 1961 immigration intake to Australia of approximately 65,000 increased until 1969, the peak of Australia's migration, when the country admitted 185,000 persons. However, in 1971 the intake was reduced to 140,000 and levels planned for 1972 to 1973 reduced to 110,000 persons. This number fell to 80,000 in 1974 and 50,000 in 1975. Immigration quotas increased steadily after 1975 to 126,000 in 1990 and then decreased in 2001 to 80,000 places (DIMIA, 2001, pp1-16). Australia has accepted on average 90,000 immigrants a year for the last 50 years of the twentieth century (DIMIA, 2001b).

The traditional argument that immigration leads to an increase in economic growth has been one of the foremost reasons for the large increases in immigration to Australia after the Second World War (Wooden *et al.*, 1990, p110). The increase in international trade between 1961 and 2001 coincided with Australia's population almost doubling. Immigration was, and still is, a major contributor to Australia's population growth. The population of 7,000,000 after the Second World War (1945) comprised 10% of overseas-born persons. This proportion increased to 16% in 1961 and to 22% by 2001 (DIMIA, 2001a). Immigration levels per five-year period have ranged from 344,779 to 781,021 documented arrivals. In addition to 22% of Australia's population having been born overseas in 2001, 19% of the Australia-born population had at least one parent born overseas. These figures indicate that, as a proportion of its total population, Australia has the largest immigrant population of any Organisation for Economic Cooperation and Development (OECD) country (Hugo, 2001, p1).

## **2.2. CHANGES IN DIRECTION OF AUSTRALIAN TRADE**

Australia's post federation trade policy was dominated by protectionist views (mostly to benefit Australia's manufacturing industries) and imperial preference towards the United Kingdom. In the 1950s the United Kingdom was the destination for 36% of Australia's exports and the source of 45% of Australia's imports (Pomfret, 2000). The greatest perceived threat to Australia's trade policy after the Second World War was a change in the conditions surrounding Australia's substantial trade with the United Kingdom. It was surmised that the UK's increasing involvement with the European Community could disrupt those conditions. This threat was realised in the 1970's when the UK joined the European Community and preferential treatment of Australian agricultural exports, a major component of Australian exports, ceased (Pomfret, 2000). Combined with the emergence of the dynamic and rapidly growing East Asia region, there was a change in focus on the direction of Australia's trade in the 1960's and 1970's. The expectation of benefits from increased trade with the East Asia region strongly influenced the decision to break with protectionist ideals. While the Vernon Committee concluded in 1965 that "we have no doubt that the Tariff has played an important part in Australia's economic growth", this view was reversed in the 1970s and 1980s with tariff reduction perceived as the method through which greater growth could be best achieved (Snape *et al.*, 1998).

Australia's relationship with Asian neighbours has been strengthened by recent free trade agreements with Singapore, the US and Thailand. Australia is also currently negotiating with a number of countries within the Asia Pacific region, notably China, Japan, India, and Malaysia. Changes in trade flows can be clearly seen in Tables 2 and 3. Table 2 demonstrates the shift in Australia's export patterns from the more traditional destination of Europe, to the Asia Pacific region. In 1961 only three (Japan, China, Hong Kong - 2<sup>nd</sup>, 7<sup>th</sup> and 10<sup>th</sup>

respectively) of the top ten destination countries for Australian exports were in the Asia Pacific region, whereas in 2001 there were seven (Japan, Korea, China, Singapore, Taiwan, Hong Kong and Indonesia - respectively 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup>).

The source of Australia's imports has also undergone significant change during the last four decades which are congruent with changes in Australia's immigrant stock and export direction. The import-country base has broadened. In 1961 the top three importers provided almost 65% of Australia's imports, whereas in 2001 the top three importers accounted for just over 40%. The flow of imports into Australia has also changed, shifting from European nations towards the Asia Pacific region. In 1961, only Japan, Indonesia and India (4<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> respectively) featured in the list of top ten import sources. In 2001 six of these top ten nations were from the Asia Pacific region (Japan, China, Korea, Malaysia, Singapore and Taiwan - 2<sup>nd</sup>, 3<sup>rd</sup>, 6<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> respectively).

In 2000/2001 Australia's trade in cultural item exports was AUS \$478,100,000, or 0.4% of exports, and its trade in cultural imports was AUS \$3,130,700,000 or 2.6% of imports (Australia's Trade in Culture, 2003). Fifty six percent of these exports were cinematographic, photographic, radio and television related items, books, newspapers and other printed media, as well as musical instruments and audio and visual equipment. A component of this cultural trade would be affected by a change in the levels and dimensions of Australia's immigrant stock.

Today Australia's trade policy is centered on the Asia Pacific region, the major targets being Japan, China, the United States and Indonesia. Australia is also actively pursuing trade liberalisation on bilateral, regional and multilateral levels (DFAT, 2004 and Tables 2 and 3).

### 3. METHODOLOGY

#### 3.1 THE MODEL

A revised gravity model of trade<sup>2</sup> is used to examine the relationship between immigration and the volume of trade in Australia with 25 major trading partners during 1961-2001 at five-year intervals that is, for the years of 1961, 1966, 1971, 1976, 1981, 1986, 1991, 1996 and 2001. Following Dunlevy and Hutchinson (1999) the volume of imports of Australia from trading group *i* in a specific year *t* can be written as:

$$M_{it} = \alpha_0 + \alpha_1 MI_{it} + \alpha_2 PO_{it} + \alpha_3 RE_{it} + \alpha_4 DI_i + \alpha_5 EN_i + u_{it} \quad (1)$$

Where,

$MI_{it}$  = the value of imports from country *i* in year *t* to Australia;

$MI_{it}$  = immigrant Stock - the number of persons that were born in country *i* that immigrated to Australia in year *t*.

$PO_{it}$  = the size of the population of country *i* in year *t*.

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<sup>2</sup> See Bergstrand (1985) for more details about Gravity models.

$RE_{it}$  = relative Income - the relative difference between per capita incomes of Australia and country  $i$  in year  $t$ . It is calculated by dividing the country  $i$ 's per capita income for year  $t$  by Australia's per capita income to get a relative value. This variable, it should be emphasised is neither commodity nor trading partner specific.

$DI_i$  = Distance - measured in kilometers between the capital city in country  $i$  and the nearest Australian point of entry at Perth, Darwin or Melbourne.

$EN_i$  = English Language - a dummy variable equal to one if country  $i$  is predominantly English speaking or has one of its official languages recorded as English.

$u_{it}$  = error term satisfying the usual assumptions

Similarly, volume of exports from Australia to trading group  $i$  in year  $t$  ( $X_{it}$ ) is written as the following function:

$$X_{it} = \beta_1 MI_{it} + \beta_2 PO_{it} + \beta_3 RE_{it} + \beta_4 DI_i + \beta_5 EN_i + v_{it} \quad (2)$$

The *Immigrant Stock* is expected to be an important variable capturing the effect of the number of immigrants from a trading country. Similarly, an increase in population in Australia's trading partners is also expected to influence its exports to and imports from these countries. *Relative income* captures the Linder taste effects. This occurs when countries with similar per capita incomes manufacture products from a similar category but that are slightly differentiated (Linder, 1961). These types of commodities represent intra-industry trade between the countries. *Distance* between the trading country and Australia is included to account for the effect of transportation costs. A dummy variable for *EnglishLanguage* is used to account for the difference in transaction costs and information costs between English-speaking and non-English speaking traders.<sup>3</sup>

### 3.2. THE DATA

The study conducts a cross section analysis of 25 countries over the period 1961-2001 with data recorded every 5 years, coinciding with the Australian census reports. Data on immigrants were collected from Census reports published by the Australian Bureau of Statistics (ABS). Data on import and export deflators for Australia, relative income, and population of the countries under study were acquired from the World Bank Database (2003). Import and export data came from the Department of Foreign Affairs and Trade (DFAT) publications on trade and the ABS statistical yearbooks and is denominated in thousands of Australian dollars. The English dummy variable was obtained through the Central Intelligence Agency (CIA) *World Fact Book* and was recorded as one if English was one of the official languages for the country in question. The distance variable was obtained through using a website that calculated the distance between two locations as the crow flies (How Far Is It? 2003). The capital cities of each country were then taken and the distance between them

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<sup>3</sup> The English dummy variable was not included for the North American equation and was removed for the European equation due to near singularity of the matrix of exogenous variable. The effects are believed to be small due to the fact most of the countries in this Europe speak English as their second language.

and the nearest Australian city (Perth, Darwin or Melbourne) was measured. This value, in kilometers, was used as the distance variable.

### 3.3 THE ESTIMATION PROCESS

To estimate the value of the parameters of our equations, we use the Seemingly Unrelated Regression (SUR) estimation procedure introduced by (Zellner, 1962). There are two reasons why SUR is expected to give more efficient estimates of the parameters. First, since we are dealing with aggregated data from heterogenous countries, a heteroschedastic covariance matrix is expected. One could use OLS with White or Newey-West adjusted covariance matrix to obtain correct estimates, but this procedure is known to be less efficient than Generalised Least Squares (GLS). Second, the levels of Australia's trade with other countries might be influenced by a number of other variables that have been omitted from the equations in our model and are picked up by the residuals in each equation. Since the same model is estimated over a number of years, it is likely that the error terms in the different years are correlated. Hence, to the extent that such a correlation between error terms of the different equation exists, SUR will yield consistent and unbiased estimates that are more efficient than OLS and GLS. Furthermore, if such a correlation does not exist, SUR becomes equivalent to GLS which yield the most efficient estimates in the presence of heteroschedasticity

25 of Australia's major trading partners and important sources of immigrants were included in the study namely, Australia, Belgium and Luxembourg (combined) Canada, China, Egypt, Fiji, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Malaysia, Netherlands, New Zealand, Pakistan, Papua New Guinea, Philippines, Singapore, South Africa, Sri Lanka, Thailand, the United Kingdom and the United States. The countries selected account for the origin of approximately 76% of all overseas-born persons living in Australia in 1961. The figure declines slightly to around 65% in 2001. The countries selected also accounted for a significant portion of Australia's foreign trade during the last four decades, comprising between 80% to 85% of all recorded imports into Australia over the period 1961 to 2001, and between 68% to 88% of all recorded exports from Australia over the same period.

Initially, a regression was run on all the countries under consideration and then an attempt was made to capture the impact of immigration on Australian trade based on regional difference. All 25 countries were divided under two regional groups: 11 European and North American countries (including South Africa and New Zealand)<sup>4</sup> and 14 Asian, Middle Eastern and Pacific Island countries<sup>5</sup> The reasoning behind this is that the cultures of non-European countries differ more markedly than European countries and as such personal tastes relating to items purchased from their home countries by respective group of immigrants will vary. In order to investigate whether or not these different immigrant streams have different impacts on trade, a second set of regression was run on these two separate groups of countries. This could potentially explain any variation in the size of the effects of immigrants on Australia's trade over time. It is acknowledged that some efficiency in the estimates will be lost by splitting the countries into smaller groups, but this is offset to some extent by the

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<sup>4</sup> Belgium and Luxembourg (Combined) Canada, France, Germany, Ireland, Italy, Netherlands, New Zealand, South Africa, the United Kingdom and the United States of America.

<sup>5</sup> China, Egypt, Fiji, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, Papua New Guinea, Singapore, Sri Lanka, Thailand, and the Philippines.

additional inferences that we will be able to make on the relationship between immigration and trade in Australia during the period under investigation.

## **4. EMPIRICAL RESULTS**

### **4.1. IMPORT TRADE IN AUSTRALIA**

The results from the estimations focusing on imports during the period 1961 to 2001 are displayed in Table 4 (25 countries selected from the Asia Pacific region and Europe as single group), Table 5 (11 European and North American countries including South Africa and New Zealand as a sub group), and Table 6 (14 Asian, Middle Eastern and Pacific Island countries as the another sub group)<sup>6</sup>.

#### **4.1.1. IMMIGRANT STOCK**

The results from the regression show that amongst the total group of countries, the immigrant stock was only significant for the first three sets of 5 years (1961, 1966 and 1971). After this period, it failed to have any significant influence on the levels of imports into Australia. However the significance level for immigrant stock at these periods was at 1% and the coefficient for immigration and imports was positive, which indicates that increases in immigration would cause increases in imports. The magnitude of the relationship was fairly similar throughout 1961, 1966 and 1971 being approximately AUS\$105 import rise per 1,000 immigrants, AUS\$80 and AUS\$88 respectively.

This can be linked to the change in composition of the immigrant stock during this period. Since the abolition of the ‘White Australia Policy’ in the early 1970s there has been an increase in number of immigrants coming from areas outside Europe and Northern America. This has meant that as the proportion of the total immigrant stock from outside these regions grew (Table 1) the change in immigrant sources had an influence on the characteristics of the Australian immigrant stock. This is further reinforced when the regression results for the European and Asia Pacific regions are taken into account. It seems that initially the influx of immigrants from the Asia Pacific region had a negative, or at most, a mildly positive effect on imports, with an increasingly negative trend until 1991 when trend turned around and the relationship between immigrants from the Asia Pacific region and import demand began to be a positive and increasing relationship (Table 5). 1991 was the only year when there was no significant relationship between immigrant stock and imports. This is probably because during this transition period the effect of the migration was approaching equilibrium which is supported by the small value of the coefficient. It is also important to note that all the other coefficients were significant at the 1% level except for the years of 1961 and 1996, when they were at 5%. This could be explained by the transition past the equilibrium point in 1996, while in 1961 the immigrant stock of people from the Asia Pacific region was too small to have a stronger relationship with imports. Post 1991 the positive relationship between immigration and imports increased in size dramatically through 1996 and 2001.

This supports the theory that it takes a period of time for the stock of immigrants from a cultural base, in this case the Asia Pacific region countries, to become large enough to create a demand for culturally biased imported goods. Interestingly, the North American and European region countries (which by 1961 already had a well established immigrant

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<sup>6</sup> The coefficients for the variables can be read above the error terms, which are in brackets.



community in Australia compared with the Asia Pacific region nations), have had a continually positive and gradually increasing relationship with imports as shown in Table 6. The evidence from these regressions supports the hypothesis that a critical stock of immigrants is needed before immigrants can have a significant influence on the import trade into Australia.

#### **4.1.2. POPULATION**

Of the other coefficients, relative income and population were the only ones that demonstrated a significant relationship with imports into Australia in the ‘all countries’ scenario. The size of the populations of trading partners began to have an influence on Australia’s import trade in 1996 and 2001 with an approximate rise in import trade of AUS\$3.67 and AUS\$5.77 respectively per 1,000 persons increase in trading partners population. The larger was the trading partner in these periods, the more likely Australia was to import from the country when all the countries were considered together (Table 4). This is consistent with economic theory because larger countries generally produce more and therefore have more to export. In the Asia Pacific region the population coefficient was significant in 1996 (and positive) meaning that an increase in the population of Australia’s trading partner by 1,000 would translate into a AUS\$1.80 increase in imports (Table 5); a much smaller influence than the European and North American region whose consistently significant results can be seen in Table 6. However, the Asia Pacific results are congruent with the information obtained from the ‘all regions’ population results, where population was only significant in the last few years, possibly due to the effects of globalisation. It is also important to note that in all three categories population demonstrated an increasing trend in the coefficients, meaning that larger populations were possibly having larger effects on imports. However, these figures in a number of cases were not significant.

This increasing trend may be the result of Australia taking advantage of trading opportunities with high population countries that in a number of cases are developing nations with high fertility, which leads to high populations and large labour reserves. In these countries it is not unlikely that in low skilled industries labour costs will be low because of the large amount of low skilled labour available and therefore a number of the goods produced in these countries would be relatively cheap and therefore attractive for Australia to import. Therefore this exploitation of wage differentials is one explanation for the increasing import relationship Australia demonstrates with high population countries.

The population coefficient for the European and North American region also displays an increasing positive correlation with imports, as did the ‘all regions’. However, it was not just significant in the last few sets of years but through the entire study period.

#### **4.1.3. RELATIVE INCOME**

The relative income was significant over all the periods and held a largely positive value that demonstrated an increasing trend over the time period. The Asia Pacific region displayed a similar trend in its relative income results to that of the ‘all countries’ groupings. Relative income demonstrates an increasing trend from 1971 to 1996; from 1976 onwards the trend was positive. In the European & North American regions results there were consistently significant coefficients from 1971 to 1996 (Table 6).

#### **4.1.4. DISTANCE**

In the European and North American region, distance became a significant factor as well as being negative and increasing in value in 1986, 1991 and 1996. During 1986, a decrease of AUS\$77,240 in imports was associated with one extra kilometre distance, and the corresponding figures for 1991 and 1996 were respectively AUS\$135,690 and AUS\$258,431. Therefore the effects of distance can be seen to be approximately doubling after each period, showing an increasingly important trend for this variable in trade (Table 6). This is expected as larger distances create larger transportation costs for trade and therefore have a negative impact on imports into Australia. It can be attributed to the effects of globalisation and mobility of capital, meaning that the cost structures for production amongst different countries should theoretically be converging. However, certain costs are harder to eliminate than others, such as transport costs, which still are an important factor because of the difficulties in equalising the costs when there is difference in distances that the goods need to be traded over.

#### **4.1.5. LANGUAGE**

As expected, the English dummy had a negative effect on trade creation for the Asia Pacific region due to the barriers resulting from the lack of fluent communication. Influence of a common language has been increasing in importance, probably due to the reduction in production costs and trade barriers in other areas.

### **4.2. EXPORT TRADE IN AUSTRALIA**

The results from the estimations focusing on exports across the time period 1961 to 2001 are shown in Tables 7, 8 and 9. The coefficients for the variables can be read above the error terms (in brackets).

#### **4.2.1. IMMIGRANT STOCK**

The immigrant stock coefficient was again only significant for the periods of 1961 and 1966 when all the countries were included in the estimation. However, as expected for this period, the effect on exports was positive because of the immigrant stock utilising trade links. The effect of an extra 1,000 immigrants in these periods was approximately an increase in exports of AUS\$81 and AUS\$57, respectively. These effects were smaller in magnitude than the effects immigrant stock had on Australia's imports, indicating that on the whole immigrants worsen the balance of trade (Table 7).

The Asia Pacific region country group initially exhibited only a mild positive result in 1971 of AUS\$271 extra export per 1,000 immigrants. However, it demonstrated a negative result of AUS\$1263 per 1,000 immigrants in 1976 (Table 8). This is probably due to the removal of the 'White Australia Policy' allowing the entrance of more immigrants from the Asia Pacific region who would have consumed domestic goods that had export potential. This trend has changed recently and there are statistically significant large positive and increasing results in 1996 and 2001 meaning that an extra 1,000 immigrants would contribute AUS\$19,531 and AUS\$33,886 to exports respectively (Table 8). Although these may seem like large effects, it is important to note that the immigrants may have had indirect effects on native workers increasing their exports as well by opening up new markets. One possible explanation for the high levels of exports is the immigrant population's utilisation of the knowledge of their

home country and the trade linkages that they possess with their home country which are used to enhance the export volume of Australia. The negative period could be explained by the need for new immigrants to consume a large initial stock of capital to set up businesses aimed at certain cultural markets, and diverting local capital that could have been exported to fulfill these businesses needs. However, after this initial drafting period of high levels of capital, more capital needs would be supplied locally because of expanded production and lower capital needs for running the businesses (as opposed to start up). Higher levels of production resulting from these new enterprises also helped to buoy the export sector, the effects turning positive again as can be seen from the figures. These influences on exports are only significant for the most recent periods and as such it is indiscernible whether the trend of the relationship between immigrants and exports will be a smaller one than that on imports.

A significant increase in full fee paying overseas students due to export-oriented educational policy in Australia since the 1990s might have been one of the factors that contributed to the positive relationship between total immigration and Australia's export trade with the Asia-Pacific region. Australia attracts most of its overseas students from this region. It is therefore not surprising that the coefficients of the stock of immigrants for Asia-Pacific region are significant and quite high for the years of 1996 and 2001 (Table 8).

The European and North American country group (Table 9) also exhibited a statistically significant positive result throughout the entire period. However, these results, when compared to the effect of the immigrant stock on this region's imports, demonstrate a weaker effect on exports than what is experienced from the imports and therefore a worsening in the trade balance for all years except 1996. The gap between the effect on imports and exports diverged from 1961 until 1981 then converged until 2001 (Tables 6 and 9). It is also interesting to note that in 1996, the only year where the immigrant effect on imports was outweighed by the immigrant effect on exports in the region, was also the year when the immigrant export effects outweighed the immigrant-import effects in the Asia Pacific region (Tables 5 and 8).

For the 'all countries' grouping, the same observation can be made when the coefficients are statistically significant. The Asia Pacific region countries grouping's trend is less obvious. However, in 2001 the import effect outweighs the export effect quite substantially and the ambiguity in the general trend can perhaps be put down to lack of a significantly large enough immigrant population to have a steady effect on trade until the later years when the population had increased

#### **4.2.2. POPULATION**

The population variable is positive and significant for only 2001 for all regions. This would be expected because the larger a country's population is the more likely it is to require exports. A reason for its significance in 2001 can be attributed to Australia's increased trade with its largest Asia Pacific neighbors, which have relatively large populations. In this year, an increase of one thousand in the population in Australia's trading partners would result in an increase of AUS\$5 in exports (Table 7). The population variable is likely to stay significant in the years to come in relation to all regions.

In relation to the Asia Pacific region, while the population is only significant (at 1%) in the years 1961 and 1966, it had a positive effect of only \$AUS0.02 per extra 1,000 persons (Table 7). This is congruent with Australia's trade pattern of this time (Table 2) because

Japan and China were the biggest recipients of Australia's exports to the Asian region, and were the countries in this region that had some of the largest populations. However, beyond this period Australia diversified its trade in this region and the population variable lost its significance.

For the European and North American region the population coefficient is significant for all periods. This would be expected because Australia traded most heavily with countries in those regions with the highest populations and their greater populations also served as a larger market for Australian trade. This trend has persisted, demonstrated by the increasing coefficient values for the North American and European region populations (Table 9). Population can be seen to have a consistently more powerful effect on imports than exports in the North American and European region for the period.

#### **4.2.3. RELATIVE INCOME**

The relative income coefficient is positive, increasing in magnitude and significance for all years in every country grouping. This is to be expected because countries with larger incomes have a greater ability to purchase Australian exports and therefore are likely to be larger consumers of them. It is notable that the European and North American region demonstrated a larger export effect of relative income than an income effect until 1986 when the relative income effect on imports was larger in magnitude (Table 9).

Relative income in the Asia Pacific region was significant for a large number of the periods in both exports and imports. Although it demonstrated a positive and increasing result for both trade flows, the effect on exports was a bigger factor than its effect on imports (Tables 5 and 8). This gap between the two effects however narrowed from the export effect being over twice the size of the import effect in 1961 to it being almost the same size in 1986, thereafter it widened and then stayed at approximately the same level.

Relative income in the 'all countries' grouping also was shown to be important for all the years examined, and demonstrated a similar trend of the effect on exports being larger initially, then narrowing until 1986. However, even though the trend was similar it is important to note that the import effect of relative income was greater in 1981 and 1986 (Table 7).

#### **4.2.4. DISTANCE**

Distance becomes significant in the 'all countries' estimation, for the periods of 1991, 1996 and 2001 influencing exports, per kilometer, by approximately AUS\$161,000, AUS\$303,000 and AUS\$395,000 (table 7). It is, as would be expected, a negative value because of transport costs. In addition, Australia's export trade with its Asia Pacific region neighbors has increased over the years at the expense of its traditional trading partners in Europe and North America. It is also mildly significant, (at the 10% level) in 1961 meaning that an extra kilometer of distance affected Australian exports by AUS\$899. This may be attributable to the fact that the European and North American region accounted for so much of Australia's trade at this time that its transportation biases were influential on the entire sample. In the Asia Pacific region this variable is not significant, indicating that it is likely that other factors influence Australia's trade with these regions because the transport costs are likely to be fairly similar amongst the entire region. In the European and North American region distance is constantly a significant factor as would be expected by the large transport costs involved.

The increasingly negative relationship that distance, and as such transport costs, bears with exports can be seen to be manifested in Australia's increased trade recently with its closer neighbours in the Asia Pacific as opposed to Australia's traditional trading partners in Europe and North America (Tables 8 and 9).

In the European region where distance was significant throughout the period for both imports and exports, the negative effects of transportation costs were larger when considering Australia's exports. However, the gap between the two decreased until 1986, with distance always having a heavier influence on exports than imports, and then began to widen again after this period.

#### **4.2.5. LANGUAGE DUMMY**

The language dummy is negative in the Asia Pacific region, as would be expected, because a lack of easy communication is likely to hinder trade. It is only significant for one year for all exports, 1986, and only at the 10% level. This relates to the period when Australia began to trade more heavily with its Asian neighbours and as such, in this initial phase, it is likely that the language barriers effect on trade would be exacerbated due to the lack of experience with the problem. The English dummy coefficient rose in size from 1961 until 1981 for the Asia Pacific region before decreasing significantly in 1986 (Table 8). An explanation for this is that in the years prior to 1981 the migration programme had been suppressed to its lowest levels since the Second World War and as such there would be a smaller proportion of new immigrants in Australia from the Asia Pacific region, with a lower English language proficiency and as such the effect, although lagged somewhat, would be to reduce the size of the effect of the English dummy. However after this period migration levels increased up again resulting in increased levels of immigrants without lacking English competency and therefore a larger effect of the English dummy.

### **5. CONCLUSION**

The volume and direction of Australian trade significantly changed during the last half century. Side by side, the number of immigrants in Australia and their sources changed during the same period. The relationship between immigration and trade has recently been the subject of much research and there are varying conclusions on the matter. There is growing evidence that immigration, apart from its impact on the labour market in the host country, has significant effects on the increase of imports. This mainly results from immigrants' preference for their home-country products. Immigration also influences the export trade of the host country by developing new businesses, contributing to technological advancement, and adding productive diversity through knowledge of international business markets. This study is aimed at examining a specific period in Australia's history and with the aim of examining the effects immigration has had on Australia's trade. It empirically investigates the link between immigrants and Australia's imports and export trade for the period 1961-2001. A modified gravity model is employed to conduct the investigation. The empirical results demonstrate that the impact of immigration on Australian trade is quite significant. However, the impact is stronger on imports than it is on exports.

## **6. ACKNOWLEDGEMENTS**

Research for this paper has been funded by the UWA Research Grants Scheme. In preparing this paper, I am greatly indebted to Professors R T Appleyard, Antony Selvanathan, Kim Sawyer and Mr Mel Davies for their constructive comments on earlier versions. I also wish to thank Ben Dyer and Nathan Blight for research assistance.

**TABLE 1. TOP TEN COUNTRIES OF BIRTH OF IMMIGRANTS IN AUSTRALIA 1961-2001**

<b>1961</b>	<b>(%)</b>	<b>1981</b>	<b>(%)</b>	<b>2001</b>	<b>(%)</b>
United Kingdom	40.4	United Kingdom	35.2	United Kingdom	25.1
Italy	12.8	Italy	9.2	New Zealand	8.7
Germany	6.1	New Zealand	5.9	Italy	5.5
Netherlands	5.7	Yugoslavia	5.0	Vietnam	3.6
Greece	4.3	Greece	4.9	China	3.6
Poland	3.4	Germany	3.7	Greece	3.2
Yugoslavia	2.8	Netherlands	3.2	Germany	2.7
New Zealand	2.6	Poland	2.0	Philippines	2.7
Malta	2.2	Malta	1.9	India	2.3
Ireland	2.1	Lebanon	1.7	Netherlands	1.8
Total	82.6	Total	73.5	Total	58.9

Source: Based on rankings by DFAT, (2001), Census 2001.

**TABLE 2. TOP TEN COUNTRIES OF AUSTRALIAN EXPORT DESTINATION 1961-2001**

<b>1961</b>	<b>(%)</b>	<b>1981</b>	<b>(%)</b>	<b>2001</b>	<b>(%)</b>
United Kingdom	23.9	Japan	27.6	Japan	19.7
Japan	16.7	United States	11.1	United States	9.8
United States	7.5	New Zealand	4.7	Korea	7.7
New Zealand	6.4	United Kingdom	3.7	New Zealand	5.7
France	5.3	China	3.5	China	5.7
Italy	4.9	Korea	2.8	Singapore	5.0
China	4.1	Singapore	2.6	Taiwan	4.9
Germany	2.8	Germany	2.6	United Kingdom	3.9
Belgium	2.3	Malaysia	2.3	Hong Kong	3.3
Hong Kong	1.9	Taiwan	2.1	Indonesia	2.6
Total	75.8	Total	63.0	Total	68.3

Source: Based on rankings by DFAT, (2001).

**TABLE 3. TOP TEN COUNTRIES OF IMPORTERS TO AUSTRALIA 1961-2001**

<b>1961</b>	<b>(%)</b>	<b>1981</b>	<b>(%)</b>	<b>2001</b>	<b>(%)</b>
United Kingdom	31.3	United States	22.1	United States	18.9
United States	20.0	Japan	19.3	Japan	12.9
Germany	13.8	United Kingdom	8.4	China	8.4
Japan	6.0	Germany	5.7	United Kingdom	5.3
Canada	4.2	Saudi Arabia	5.5	Germany	5.2
Indonesia	2.6	New Zealand	3.4	Korea	3.9
India	2.1	Taiwan	2.7	New Zealand	3.9
Iran	1.7	Singapore	2.7	Malaysia	3.5
Sweden	1.6	Canada	2.7	Singapore	3.3
New Zealand	1.6	Italy	2.3	Taiwan	2.8
Total	84.9	Total	74.8	Total	68.1

Source: Based on rankings by DFAT, (2001).



**TABLE 4: IMPORTS FROM ALL COUNTRIES 1961-2001**

	<b>Intercept<sup>a</sup></b>	<b>Relative Income<sup>a</sup></b>	<b>Immigrant Stock<sup>b</sup></b>	<b>Population<sup>b</sup></b>	<b>Distance</b>	<b>Eng Dummy<sup>a</sup></b>
<b>1961</b>	-5.932	9.044***	105.147***	0.020	0.469	4.759
	(5.932)	(3.089)	(13.189)	(0.016)	(0.554)	(2.942)
<b>1966</b>	-9.648	17.046***	79.991***	0.025	0.863	8.025
	(8.942)	(4.887)	(15.513)	(0.021)	(0.828)	(4.112)
<b>1971</b>	-17.882	37.942***	88.209***	0.042	1.265	12.076
	(15.945)	(7.376)	(22.850)	(0.033)	(1.453)	(7.530)
<b>1976</b>	-33.510	157.630***	102.234	0.131	0.132	28.818
	(56.374)	(27.223)	(78.275)	(0.107)	(5.226)	(29.515)
<b>1981</b>	-48.838	620.947***	133.700	0.469	-7.421	66.941
	(204.510)	(96.427)	(280.051)	(0.359)	(18.816)	(111.576)
<b>1986</b>	-24.561	1997.949***	239.034	1.146	-39.952	-74.609
	(562.116)	(283.208)	(805.304)	(0.921)	(52.131)	(338.268)
<b>1991</b>	-291.469	2145.604***	160.682	1.970	0.419	191.996
	(851.259)	(334.899)	(1447.330)	(1.257)	(76.328)	(489.389)
<b>1996</b>	-521.162	3151.301***	127.019	3.677**	35.158	418.820
	(1342.333)	(576.607)	(2450.660)	(1.861)	(119.746)	(805.864)
<b>2001</b>	597.515	4137.556***	3702.875	5.767*	46.446	-1021.867
	(2170.279)	(1304.445)	(4516.278)	(2.971)	(206.586)	(1676.542)

Total number of observations: 225

Standard error given below the coefficients in parentheses

\*\*\* Significant at the 1% level of significance

\*\* Significant at the 5% level of significance

\* Significant at the 10% level of significance

LM Test for CSIC = 726.487\*\*\*

<sup>a</sup> '000s

<sup>b</sup> per1000 head increase

**TABLE 5: ASIA PACIFIC REGION IMPORTS 1961-2001**

	<b>Intercept<sup>a</sup></b>	<b>Relative Income<sup>a</sup></b>	<b>Immigrant Stock<sup>b</sup></b>	<b>Population<sup>b</sup></b>	<b>Distance</b>	<b>Eng Dummy<sup>a</sup></b>
<b>1961</b>	3.958** (1.729)	18.850*** (1.858)	42.759** (16.839)	0.003 (0.003)	-0.370 (0.254)	-5.275*** (1.270)
<b>1966</b>	3.683* (2.139)	34.541*** (2.050)	-293.950*** (76.016)	0.008 (0.004)	0.048 (0.317)	-9.275*** (1.320)
<b>1971</b>	-2.019 (2.973)	71.457*** (2.443)	157.375*** (4.378)	0.005 (0.004)	0.083 (0.451)	-16.555*** (2.464)
<b>1976</b>	1.021 (16.737)	288.170*** (10.132)	-822.212*** (100.736)	0.038 (0.023)	1.114 (2.500)	-60.922*** (13.008)
<b>1981</b>	115.431 (100.785)	1060.848*** (56.185)	-4277.433*** (408.969)	0.193 (0.128)	-6.184 (14.638)	-310.276*** (71.295)
<b>1986</b>	155.811 (406.508)	3245.386*** (209.575)	-8070.157*** (1477.143)	0.437 (0.480)	2.714 (60.739)	-1064.910*** (321.700)
<b>1991</b>	452.352 (501.398)	3120.758*** (212.589)	-494.746 (918.080)	0.794 (0.515)	-46.778 (75.294)	-1397.931*** (402.318)
<b>1996</b>	875.834 (774.758)	4224.681*** (323.826)	4877.984** (2079.085)	1.794** (0.702)	-118.012 (116.467)	-2112.210*** (634.218)
<b>2001</b>	903.801 (1542.397)	7250.897** (622.704)	40248.290*** (4982.304)	1.898 (1.212)	-228.565 (234.466)	-4898.064*** (1301.086)

Total number of observations: 126

Standard error given below the coefficients in parentheses

\*\*\* Significant at the 1% level of significance

\*\* Significant at the 5% level of significance

\* Significant at the 10% level of significance

LM Test for CSIC = 221.423\*\*\*

Note: Includes Egypt and Fiji.

<sup>a</sup> '000s

<sup>b</sup> per 1000 head increase

**TABLE 6: EUROPEAN AND NORTH AMERICAN IMPORTS 1961-2001**

	<b>Intercept<sup>a</sup></b>	<b>Relative Income<sup>a</sup></b>	<b>Immigrant Stock<sup>b</sup></b>	<b>Population<sup>b</sup></b>	<b>Distance</b>
<b>1961</b>	-14.077 (12.902)	10.388*** (2.224)	113.493*** (10.174)	0.331*** (0.057)	-0.103 (0.996)
<b>1966</b>	1.854 (16.316)	-1.060 (1.828)	90.336*** (9.499)	0.558*** (0.064)	-0.588 (1.263)
<b>1971</b>	4.147 (23.006)	-4.660*** (1.283)	107.858*** (8.914)	0.957*** (0.083)	-0.832 (1.788)
<b>1976</b>	9.219 (59.827)	18.638** (9.009)	179.225*** (22.942)	3.099*** (0.219)	-5.182 (4.654)
<b>1981</b>	90.884 (187.854)	85.547*** (13.692)	371.030*** (61.093)	10.441*** (0.649)	-21.790 (14.627)
<b>1986</b>	238.313 (400.737)	605.322*** (104.207)	914.702*** (159.180)	25.627*** (1.410)	-77.240** (31.206)
<b>1991</b>	174.260 (653.790)	1127.725*** (89.865)	1558.535*** (245.168)	38.892*** (1.910)	-135.690*** (50.610)
<b>1996</b>	439.738 (1107.923)	2240.116*** (95.153)	2034.097*** (517.714)	66.734*** (3.304)	-258.431*** (85.245)
<b>2001</b>	1256.902 (3083.443)	766.139 (591.322)	5817.916*** (1626.219)	84.769*** (5.607)	-161.268 (234.874)

Total number of observations: 99

Standard error given below the coefficients in parentheses

\*\*\* Significant at the 1% level of significance

\*\* Significant at the 5% level of significance

\* Significant at the 10% level of significance

LM Test for CSIC = 221.502\*\*\*

Note: Includes South Africa

<sup>a</sup> '000s

<sup>b</sup> per1000 head increase

**TABLE 7: ALL EXPORTS 1961-2001**

	<b>Intercept<sup>a</sup></b>	<b>Relative Income<sup>a</sup></b>	<b>Immigrant Stock<sup>b</sup></b>	<b>Population<sup>b</sup></b>	<b>Distance</b>	<b>Eng Dummy<sup>a</sup></b>
<b>1961</b>	7.886 (4.489)	15.526*** (3.696)	81.240*** (10.931)	0.0157 (0.001)	-0.899* (0.461)	-3.561 (2.643)
<b>1966</b>	9.245 (6.674)	27.592*** (4.779)	57.198*** (12.216)	0.026 (0.017)	-1.034 (0.652)	-4.018 (3.456)
<b>1971</b>	25.965 (15.990)	46.819*** (9.664)	14.227 (23.900)	0.012 (0.036)	-2.180 (1.526)	-10.174 (8.806)
<b>1976</b>	126.713 (77.189)	202.055*** (43.263)	-170.562 (112.844)	0.053 (0.156)	-9.416 (7.390)	-89.200 (45.709)
<b>1981</b>	360.879* (212.822)	541.382*** (110.464)	-469.858 (301.069)	0.304 (0.397)	-25.787 (19.947)	-196.636 (124.666)
<b>1986</b>	797.824* (465.958)	1269.411*** (230.106)	-996.465 (669.419)	0.877 (0.803)	-66.257 (43.074)	-508.459* (278.484)
<b>1991</b>	1603.370** (810.277)	2405.256*** (360.657)	-2173.869 (1388.376)	1.234 (1.285)	-161.424** (73.754)	-472.909 (505.813)
<b>1996</b>	2912.623** (874.226)	2973.443*** (440.983)	-374.114 (1619.125)	2.071 (1.306)	-303.014*** (79.866)	-528.818 (606.542)
<b>2001</b>	3720.039** (1659.533)	5197.778*** (897.518)	-2341.941 (3138.909)	5.001** (2.343)	-395.229** (152.422)	-431.971 (1106.686)

Total number of observations: 225

Standard error given below the coefficients in parentheses

\*\*\* Significant at the 1% level of significance

\*\* Significant at the 5% level of significance

\* Significant at the 10% level of significance

LM Test for CSIC = 805.405\*\*\*

Note: <sup>a</sup> '000s

<sup>b</sup> per 1000 head increase

**TABLE 8: ASIA PACIFIC REGION EXPORTS 1961-2001**

	<b>Intercept<sup>a</sup></b>	<b>Relative Income<sup>a</sup></b>	<b>Immigrant Stock<sup>b</sup></b>	<b>Population<sup>b</sup></b>	<b>Distance</b>	<b>Eng Dummy<sup>a</sup></b>
<b>1961</b>	1.047 (1.935)	56.047*** (2.435)	-175.189 (72.533)	0.020*** (0.004)	-0.100 (0.281)	-7.628*** (1.195)
<b>1966</b>	4.714 (3.749)	72.458*** (3.819)	-21.505 (106.820)	0.018*** (0.01)	-0.527 (0.542)	-11.543*** (2.199)
<b>1971</b>	6.216 (7.148)	148.874*** (5.581)	271.583*** (81.694)	-0.004 (0.011)	-0.592 (1.049)	-34.020*** (5.515)
<b>1976</b>	22.711 (56.527)	647.437*** (39.158)	-1263.169*** (462.875)	0.044 (0.078)	1.939 (8.208)	-171.582*** (39.390)
<b>1981</b>	116.175 (188.925)	1597.495*** (115.651)	-530.661 (1228.918)	0.146 (0.241)	-2.057 (27.202)	-512.923*** (128.671)
<b>1986</b>	144.671 (461.916)	3469.722*** (260.430)	-1302.658 (2460.618)	0.579 (0.544)	2.195 (66.329)	-1140.325*** (314.866)
<b>1991</b>	660.417 (796.098)	5446.312*** (379.528)	622.196 (3620.183)	0.388 (0.864)	-60.584 (115.991)	-1991.599*** (592.986)
<b>1996</b>	611.047 (1020.371)	6680.909*** (508.521)	19531.240*** (5250.156)	0.295 (1.040)	-89.697 (146.980)	-3016.752*** (771.434)
<b>2001</b>	45.512 (1749.944)	12231.415*** (945.611)	33886.360*** (8812.007)	0.654 (1.709)	-64.464 (251.123)	-4985.796*** (1313.732)

Total number of observations: 126

Standard error given below the coefficients in parentheses

\*\*\* Significant at the 1% level of significance

\*\* Significant at the 5% level of significance

\* Significant at the 10% level of significance

LM Test for CSIC = 385.410\*\*\*

Note: Includes Egypt and Fiji.

<sup>a</sup> '000s

<sup>b</sup> per1000 head increase

**TABLE 9: EUROPEAN AND NORTH AMERICAN EXPORTS 1961-2001**

	<b>Intercept<sup>a</sup></b>	<b>Relative Income<sup>a</sup></b>	<b>Immigrant Stock<sup>b</sup></b>	<b>Population<sup>b</sup></b>	<b>Distance</b>
<b>1961</b>	1.773 (7.606)	16.218*** (2.171)	104.454*** (9.209)	0.095** (0.041)	-1.237** (0.601)
<b>1966</b>	6.467 (7.868)	21.238*** (1.750)	85.080*** (6.298)	0.282*** (0.037)	-1.944*** (0.617)
<b>1971</b>	28.214** (13.719)	11.519** (5.624)	70.343*** (8.399)	0.484*** (0.058)	-3.092*** (1.046)
<b>1976</b>	94.464*** (34.849)	58.557*** (6.566)	64.371*** (11.158)	1.557*** (0.113)	-10.317*** (2.690)
<b>1981</b>	321.930** (132.210)	161.069*** (17.860)	185.429*** (35.017)	5.711*** (0.414)	-36.762*** (10.226)
<b>1986</b>	609.566*** (216.548)	490.770*** (42.126)	463.321*** (61.819)	10.617*** (0.687)	-81.887*** (16.648)
<b>1991</b>	1239.277** (589.843)	839.285*** (103.689)	1063.355*** (227.683)	20.264*** (1.582)	-164.929*** (45.176)
<b>1996</b>	3755.009*** (791.133)	1201.969*** (140.162)	2595.454*** (337.001)	17.618*** (2.225)	-363.262*** (60.990)
<b>2001</b>	4299.696*** (1398.572)	2300.436*** (222.459)	4198.720*** (643.057)	45.266*** (3.069)	-515.939*** (107.112)

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Total number of observations: 99

Standard error given below the coefficients in parentheses

\*\*\* Significant at the 1% level of significance

\*\* Significant at the 5% level of significance

\* Significant at the 10% level of significance

LM Test for CSIC = 233.183\*\*\*

Note: Includes South Africa

<sup>a</sup> '000s

<sup>b</sup> per1000 head increase

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