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THE IMPORTANCE OF BEING BRITISH? IMPERIAL FACTORS AND THE GROWTH OF BRITISH EXPORTS, 1870-1960

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Abstract

Between 1870 and the 1950s British exports to the Empire and Commonwealth steadily grew in terms of volume and as a proportion of all exports. To many this reflected the non-market advantages Britain enjoyed there, advantages allegedly rooted in imperial rule and the inherent Britishness of these markets. This paper tests this claim. Using quantitative methods, it gauges the net effect of such factors and shows that the growth of British exports to the Empire was not simply, or even predominately, due to imperial advantages. In most periods, other factors, most notably the economic growth of the importing markets, were of much greater importance.

Keywords : Trade patterns, international trade, British exports, British Empire, Empire markets, imperial trade

I. INTRODUCTION

Empirical studies reveal that international trade flows do not conform to the expectations of traditional theory. Some nations trade 'too much' with each other, others 'too little'. High-income, capital-rich countries, thus, tend to trade more with each other and less with low-income, labor-abundant countries than expected (Anderson and Marcouiller 2002). National boundaries seem to matter (McCallum 1995; Helliwell 1998) as do the cultural affinities, or psychic distance, between potential trading partners (Beckerman 1956; Nordstrom and Vahlne 1994). One explanation put forward for this phenomenon is based on an acknowledgement that transnational, coethnic networks can be crucial in shaping trade patterns (Saxenian 1999; Rauch 2001). Drawing upon the experience of Maghribi traders of the eleventh-century Mediterranean, Greif (1989; 1993), for example, has shown how these networks can both facilitate trade by deterring opportunistic behavior and hinder it by being too exclusive in their membership. One clear implication of this research is that trade can often develop more readily amongst people sharing a common identity, be that identity ethnic, religious or even political by nature.[1]

Such considerations are also often said to underpin Britain's strengthening trading relations with its colonies from the latter half of the nineteenth century. The extent of this imperial reorientation is readily apparent in the export data. Between 1871 and 1938, the proportion of all British exports going to the Empire rose from 26.8 per cent to 41.3 per cent, a rise in stark contrast to the shrinking share being taken by the developed countries of industrial Europe and the USA. Not all parts of the Empire, however, shared in this growth of importance as a market for British goods. In fact,

the main recipients of the increased flow of British exports to the Empire were the white settler colonies, later Dominions, of Australia, New Zealand, Canada and South Africa. By the 1930s, these markets alone, with a combined population of around 30 million, accounted for more than a quarter of all of Britain's exports (Cain and Hopkins 2000, pp. 153 and 432).

The reason why these markets proved to be more accessible to imports from geographically 'distant' Britain than in many cases 'nearer' America is a question that has attracted attention from observers and scholars since the trend first became apparent at the end of the nineteenth century (Flux, 1899, esp. pp. 522-533; Sargent 1930; Cain 1996; Eichengreen and Irwin 1998) A wide variety of factors, usually linked to the Empire, have, thus, been cited to account for these markets' apparent ability and willingness to absorb increasing volumes of British imports, the most common of which were their shared language, currencies, tastes, institutions, and expectations; their use of preferential tariffs; their governments' practice of buying British first where possible; their absolute dependence on British investment for continued development; and the density of their transport, distribution and communication networks with Britain (Fieldhouse, 1999; Platt, 1993; Capie, 1979; Saul, 1960; Crouzet, 1975; McDougall, 1925). Taken together, it has been argued that these interrelated considerations afforded British exporters unique advantages in the markets of both Britain's formal and informal Empire.

While many have speculated over the likely effects that these imperial advantages had on Britain's industrial competitiveness,[2] far less research has been done on determining exactly what their impact on Britain's trading patterns were. O'Rourke

and Williamson's account of the development of the Atlantic economy, for example, makes no mention of imperial factors (O'Rourke and Williamson 1999). Indeed, more often than not, the effects of Empire – one way or the other – are simply assumed. Given the centrality of the Empire to both the British and global experience for much of the nineteenth and twentieth centuries, coupled with the fact that the net effect of imperial factors on British investment has already been subjected to quantitative scrutiny (Davis and Huttenback 1986; Edelstein 2004), this gap in our knowledge is somewhat surprising. Part of its explanation undoubtedly lies in the inherent difficulty of capturing such non-market effects with traditional trade theory. This paper follows Eichengreen and Irwin (1998) in contending that an empirical, gravity-influenced approach offers more scope.

To what extent, then, did these oft-cited advantages of Empire really open markets for British exporters? Or can the chief explanation for Britain's imperial drift be found in other more prosaic considerations such as price and income? These are the questions to which this paper seeks to provide answers. The paper has four sections. In the first section, a gravity-inspired import demand function for British products is proposed and an index developed that permits the net effect of Britain's imperial advantages in particular markets to be both gauged and compared across time and place. In the following two sections, this index of relative advantage is calculated and demand functions estimated for six of Britain's major export markets between 1870 and 1960. These estimations reveal that, while Britain did appear to enjoy relative advantages in Empire markets, these advantages in themselves cannot explain Britain export patterns over most of this period. The implications of these findings are then explored in the concluding section.

II. MEASURING ADVANTAGE

Methodologically this paper draws inspiration from the large gravity literature that has emerged in recent years, a body of work that, by incorporating into its analysis variables such as distance and psychic proximity, has had much success in explaining real-world bilateral trade volumes (Anderson 1979; Bergstrand 1985; Deardorff 1998; Baier and Bergstrand 2001; Feenstra, Markusen, and Rose 2001; Harrigan 2003). Since the aim of this paper is to explain not only why Britain exported so much to its Empire, but, specifically, what contribution non-market advantages stemming from imperial connections played, obvious parallels with the gravity literature can be drawn. To address this question, a standard gravity-type equation (Bergstrand 1985) is thus adapted to the context of unidirectional trade. Hence, throughout this paper, it is assumed that the volume or demand for British exports in market j is given by the equation

$$X_{ukj} = \alpha_0(Y_j)^{\alpha 1}(P_{uk})^{\alpha 2}(D_{ukj})^{\alpha 3}(A_{ukj})^{\alpha 4}u_{ukj}$$

where X_{ukj} is the value of British exports to market j, Y_j is income in market j, P_{uk} is the price of British exports relative to its main competitors, D_{ukj} is the net effect of all imperial-related factors on trade between Britain and j, A_{ukj} a vector of other factors affecting the trade flow, and u_{ukj} is the error term.

A problem with estimating such an equation is that no measure currently exists in the literature for capturing D_{ukj}, the net effect of non-market advantages enjoyed by exporters in a particular location. A way of tackling this problem is to imagine what

the outcome of these advantages, if real, would have been: in our case, an increased demand for British products in Empire markets. In other words, if such advantages actually existed they ought in some way to be reflected in the pattern of British exports to these markets. This paper proposes a method of capturing this effect. The proposed measure focuses on the share of that market's income devoted to the purchase of British goods relative to the proportion spent in markets where the British are said to have no special advantage. Alternatively, one could express the index in per capita terms as the proportion of the average individual's income that is spent on British exports in one market relative to the proportion expended in a neutral market. More formally, this index, called the index of relative advantage (hereafter IRA), can be expressed as:

$$IRA_i = \frac{x_i / y_i}{x_j / y_j}$$

where x_i and x_j stand for the value of British exports consumed in markets *i* and *j*, while y_i and y_j represent the incomes of those markets. Of these two markets, *j* is a neutral market in which British exporters must compete on price and quality of service alone, while *i* is a market in which some degree of advantage is alleged to exist.

The logic underpinning the index is that for non-market advantages for the products of a particular country to be economically meaningful they must be embedded in the actual consumption patterns of consumers. Imagine there are two societies, A and B. These societies are identical in every respect other than the fact that consumers in A will always choose to purchase the products of a third society, C, when given the

opportunity to do so, while consumers in B always prefer the cheaper product irrespective of its origins and are indifferent between the products of C and any other society when prices are comparable. In such circumstances, one would expect that the rate of per capita consumption of the products of C should be higher in A than B. Moreover, one would further expect that as A's preference grew stronger, the disparity between the two societies' consumption of C's goods should broaden. In other words, the typical individual's consumption of the products of the preferred country ought to be positively related to the intensity of the sentiment and attachment that he or she feels toward those products. Of course, should the average income levels of our societies differ, such that a consumer in B has vastly more income at his or her disposal than his or her counterpart in A, then this relationship may no longer hold. Indeed, per capita consumption of C's products may even be higher in B than A, despite A's preferences, if the income disparity is sufficiently great. To allow for changes in consumption brought about by alterations in income levels, the IRA expresses a society's degree of consumption as a proportion of its income. Unexceptional variations in income, therefore, should not alter the propensity of a society's consumers to acquire the products of a preferred nation.

It also should be noted that the IRA is a relative measure[3], the ratio of the share of the target nation's income devoted to British products to the proportion of income expended on British goods in a neutral market where British exporters did not have any special advantages. Of course, no market is completely neutral, so there is no single market that can be used in all circumstances; what matters here, though, is that the market or markets chosen as the comparator demonstrate no significant advantage for the products of British manufacturers. In this paper, the denominator chosen is the

average share of income spent on British goods in the four most industrialized countries of Western Europe in the nineteenth and twentieth centuries: France, Germany, Belgium and the Netherlands. In these markets, no widespread preference or advantage for British products has been reported. On the contrary, protectionism and the strength of domestic industry in these countries ensured that these would continue on the whole to be challenging markets for the British, markets where sales could only be secured by remaining price competitive or by guaranteeing a superior product. Taking the weighted average of four nations also has the advantage of reducing any biases that may be introduced by relying on the consumption patterns of a single nation.[4] The value of expressing the IRA as a ratio is that it permits one to distinguish between those alterations in consumption behavior that are due to changes common to all markets, such as a depreciation or a decline in price competitiveness relative to one's rivals, and those that can be attributed to circumstances unique to the market under investigation. The latter category of changes ought to increase the value of the IRA, while the former should leave it unaltered. Indeed, the further that the IRA is above one, the greater the advantage for British products in the market.

In essence, the value of the IRA is driven by everything, internally and externally, that makes the proportion of one country's income devoted to British exports different from another's. A large number of factors enter into consideration here, each of which is evaluated from a comparative perspective. They include such things as the scale of British investment, tariff rates for British products, the degree of cultural and ethnic affinity felt for Britain, the 'Britishness' of consumers' preferences, government purchasing practices and regulatory standards that favored British goods, the frequency of shipping links to Britain and elsewhere (an especially important

consideration where distance to market was a factor), and the extent of local import substitution possible. These are factors that have often been adduced as sources of British advantage in both Empire and former Empire markets. For example, recent research has shown that British exporters right through to the 1960s continued to benefit from established marketing channels and brand-name loyalties in the Commonwealth (Eichengreen and Irwin 1998), a fact that demonstrates two essential points about the nature of the advantages afforded by imperial connections: that they were not simply a product of official policies and that they could endure even after formal political ties had been severed. Our definition of imperial advantage is thus necessarily both relative by nature and inclusive in the sense that it embraces all non-market, Empire-related factors – direct and indirect, official and unofficial – that influence Britain's ability to sell in a particular location. Given this definition and that the aim of this paper is to determine the overall *net* contribution of these relative advantages to the growth of British exports to the Empire, the design of the IRA would appear particularly well-suited to the task at hand. At any rate, since many of the factors cited here are clearly collinear by nature, running each separately in an estimation, in many cases necessarily as a qualitative dummy, is problematic, something that has been noted with regard to the gravity equation (Voss 2004, pp. 10-11). A composite index, therefore, sidesteps many of these problems, while recognising both the relativity and the essential interconnectedness of many the advantages under consideration.[5] Take, for example, the case of the tariff rates borne by British exporters in Empire markets, relative both to those paid by their competitors in those same markets and those levied on British outside the Empire. Tempting as it might be to attribute the shaping of commercial policy to domestic factors alone, the fact of the matter is that if British products received preference in

Empire markets at rates that did not match those levied elsewhere, they did so only because of imperial or Commonwealth connections. From the British perspective, these tariff rate differentials – irrespective if they arose because of the actions of Empire or non-Empire governments – represented a real benefit of Empire. This was not just a static advantage either. At times of increasing global protectionism, such as in the interwar period, allowing the rates on British imports to rise less precipitously in one's home market was in fact an act that afforded the British exporter a relative advantage there.

A high IRA for British imports may also stem from a strong need for the products in which Britain happens to have a comparative advantage (Harley and McCloskey, 1981, pp. 66-68). On the face of it, such a reason does not appear to sit comfortably with those that are said to have afforded British exporters advantages in Empire markets. After all, such an advantage, it might be argued, is surely based on the price competitiveness of British manufacturers.

Yet, before coming to such a conclusion one must consider two questions: why the need for these products existed in the first place and whether the desired items actually had close non-British substitutes? Take, for example, the case of Scotch whisky and English milk chocolate, products that held a unique fondness in the hearts of British emigrants throughout the Empire – especially first generation emigrants – who missed the comforts of 'home'. Britain undoubtedly had a comparative advantage in the provision of such goods, though this advantage was based more on their cultural distinctiveness than their low costs of production. Indeed, it is clear that national tastes for confectionery explain a good part of the strong and enduring export

performance by British companies, such as Cadburys, in the markets of Australia, South Africa and India. By contrast, in Europe, or even in the US, where tastes in chocolate were very different, British firms had less opportunity to establish themselves in the market in the nineteenth and early twentieth centuries. Cadburys, thus, targeted British emigrants and expatriates in the colonies because these were the very (indeed the only) people outside the British Isles who wanted to eat and drink its products (Jones, 1984). The point of this example is that where demand was for a differentiated product, such that the British version was in some respects unique, then the society's need for the British product probably had a strong cultural dimension. In fact, only when an identical product to the British could be easily supplied by a non-British producer and the society's need was an intrinsic part of its economy's development process, in the sense that the colony could not continue to grow without these products, can it be argued that the preference for the British product was determined purely by relative prices alone. Given the indubitable influence of habit, culture and tradition on consumption behavior, not to mention the rarity of markets selling truly homogeneous products, instances where both of these conditions were met, were probably less common than one might expect. The statistical analysis conducted later in the paper supports this contention, especially for the late-Victorian and Edwardian period in which the development of New World economies was most rapid.

Furthermore, as Brown (1995, pp. 520–1) has pointed out, in many markets before the First World War, cotton textiles, in many ways the quintessential British exports of the nineteenth and early twentieth centuries, were not sold as the homogeneous bulk goods so often assumed in the literature. Rather, in wealthier societies such as

Australia and Argentina, the market can be more accurately described as monopolistically competitive. As such, non-price competition, language and cultural considerations and the ability to gather market information, rather than lower relative costs, were the crucial ingredients to success in these locations. Similarly, Reuber (1960, pp. 34, 73, 124) has primarily attributed Britain's declining export trade with Canada between 1926 and 1957 to the failure of its manufacturers to compete with their American rivals in terms of non-price factors such as design, delivery and service rather than price per se. Whether or not the demand for British products was fashioned by such considerations, from the exporter's perspective at least it nevertheless remained very good fortune indeed that such receptive and readily accessible markets existed.

A further source of difference in the average consumption levels of British imports between countries is their varying levels of economic development. *Ceteris paribus*, one would expect consumers in low-income countries to have less ability to consume non-essential British imports than consumers in high-income countries. Thus, direct comparison of the consumption patterns of high- and low-income countries will tend to result in an artificially low IRA reading for the low-income country. The IRA, thus, works best when comparing markets of roughly comparable levels of development. Such considerations need to be borne in mind when examining the IRA of low-income countries.

III. RELATIVE ADVANTAGE IN BRITAIN'S EXPORT MARKETS

The IRAs for some of the British manufacturer's most important export markets, together accounting for 44.2, 59.6 and 50.4 per cents of British exports in 1870, 1913 and 1950 respectively, are given in Table 1. These markets have been chosen both for their importance to British exporters and the availability of reliable data. The indexes in Table 1 are all calculated in terms of constant 1913 British pounds.[6]

Table 1 provides the first quantitative evidence for the belief of some historians and contemporaries (Platt, 1993, pp. 110-117) that right up to the 1950s imperial advantages, that translated itself into demand for British products, were most strongly felt in New Zealand, South Africa and Australia. Moreover, these were advantages that grew deeper over time in New Zealand and South Africa, and to a lesser extent in Australia. In 1870, for example, New Zealanders on average allocated about 10 per cent of their income to the purchase of British products, rising to just over 13 per cent by 1913. By the mid-1950s this proportion had fallen to between 5 and 6 per cent. Canada was also favorably disposed to British exporters in this period, though less so than the other Dominions. Its IRA remained fairly stable at a level comparable to Argentina's up until the 1930s, at which time it showed, like the other Dominions, marked growth. Argentina, by contrast, apart from short-lived surges in 1890-94 and 1905-09, exhibited a fairly constant degree of advantage for British imports until the Second World War, after which this advantage dissipated to such an extent that by the 1950s the British were struggling to maintain their place in this market. Continuous and intensifying struggle, especially from the 1890s, also epitomizes the experience of British producers attempting to export to the United States throughout the entire

period covered by Table 1. Thus, despite its links to Britain and common language and traditions, the United States remained a comparatively difficult market for the British to penetrate. Like the Dominions, British India displayed evidence of a marked and growing IRA for British products up until the 1930s when the index plateaued. Following independence, these relative advantages experienced by British imports in India rapidly fell away. It should be noted that the lowness of the IRA in British India (I) appears to be due not the disadvantages the British faced there, but to India's status as a low-income economy with less scope for the consumption of British goods. To arrive at a truer indication of British advantages in the Indian market, British India (II) calculates an alternative IRA with the rest of Asia as its denominator. Within this context, India is seen on average to have offered British exports greater advantages and ease of access than the other parts of Asia combined up until the Second World War.

Four general conclusions about Britain's economic relationships with its Empire and Commonwealth can be discerned form Table 1. First, as Saul (1960, p. 217) speculated, the initial round of preferential tariffs that were steadily introduced in the Dominions between 1897 and 1913 show no significant effect on trading patterns. Indeed, in all Dominion markets other than Canada the IRA is higher in 1900-04 than it is in 1910-13. Second, following the Ottawa Agreement and the general rise of protectionism in the global economy there is in the 1930s in each Dominion, but not India, a clear ratcheting up of IRAs to unprecedented levels, as British trade was consciously re-directed towards these markets. Third, there is a further surge of IRAs in Sterling Area countries in the postwar period, a surge that reaches a peak in the early 1950s and declines steadily thereafter. Fourth, from 1960, the relative

advantages for British products diminishes rapidly and uninterruptedly in all Commonwealth countries, as former colonial networks dissolve (Eichengreen and Irwin 1998, p. 55) and the focus of British trade relocates from Empire to Continental Europe.[7] By the late 1970s, of all the main Commonwealth nations only South Africa and New Zealand have an IRA greater than one. This was a dramatic turnaround. In a matter of just 20 to 25 years – a single generation – Britain's massive advantages in the Commonwealth of the 1950s are lost, as consumers in the former Empire began spending less on British goods than their counterparts in Western Europe. If the Empire had become a drag on the British economy, it was certainly one that was dispensed with fairly quickly.

Although the debate about the nature of Empire markets has almost exclusively focused on aggregate trade statistics, there is no a priori reason to believe that the degree of imperial advantage exhibited in any market should be identical for all products. The advantage of the IRA method is that in principle it can be equally applied to particular goods as total export volumes. Carrying out such an analysis in this case, however, is made difficult by the changing nature of the trade statistics supplied in the *Annual Statement of Trade and Navigation of the United Kingdom*. In that publication, export categories are frequently altered and reorganized and the volumes and values of exports of certain products to specific destinations, including some of the major markets discussed in this paper, are not consistently reported. These problems make the compilation of time series for the IRAs of particular British exports in different markets extremely difficult, if not actually impossible, for a wide range of products. Certainly, such a major exercise is beyond the scope of this paper whose objective is to address the basic question of to what extent British exporters on

the whole may have enjoyed non-market advantages in Empire markets. That said, an indication of the variation in the IRA between products is given by Table 2, which focuses on the consumption patterns of two major British exports, cotton piece goods and iron and steel, in five markets between 1870 and 1937.

The first thing to note about Table 2 is that the broad movements of the IRAs for these products are consistent with those found for the aggregate trade data in Table 1: Empire markets, other than Canada, rose and the US declined steadily throughout, while Argentina remained fairly constant, though subject to wide fluctuation, especially in iron and steel. In 1871, Argentina had the highest IRA for British cotton piece goods and the second largest for iron and steel, spending an exceptionally large 4.3 per cent of its national income on these goods in that year. By 1913, however, the Australasian markets had assumed this position as the leading pro-British markets for cotton and iron. The high IRA values given in Table 2 suggest that imperial advantage was significantly stronger in these products than for British products on average. Such a reading of the figures may be legitimate, but needs to be tempered with two qualifications. First, the IRAs listed in Table 2 are not calculated as the average of five years as in Table 1, but as annual values and, hence, are more prone to be influenced by short-term fluctuations. Second, since the proportion of a nation's income devoted to the purchase of any particular British product is comparatively tiny, even a small increase in the level of one country's consumption of that product relative to other nations can increase its IRA for that product noticeably more than its IRA for all British goods.

IV. RELATIVE ADVANTAGE AND BRITISH EXPORT GROWTH

The findings of the last section indicate that imperial advantage did seemingly have a role to play in explaining the consumption habits of the major Empire markets. Platt (1993, p. 109) was, therefore, correct in asserting that no market was truly neutral by nature. 'Physic distance' (Beckermann 1956; Nordstrom and Vahlne 1994) does seem to matter. However, it needs to be emphasized that such a finding in itself does not substantiate the claim that Britain's drift towards Empire, especially Dominion, markets between 1870 and the 1950s was driven by such non-market advantages. Here, a distinction must be drawn between the level of relative advantage enjoyed by British exporters and the rate at which that advantage changed. While a strong advantage, measured by a high IRA, may account for a nation's greater consumption of British products at any point of time, given the presence of other factors that affect demand, such as relative prices and income levels, it does not follow that this imperial advantages were the crucial ingredients stimulating the growing proportion of British exports being dispatched to these markets. For this to happen it is necessary to determine the contribution of IRA to the growth of exports. In other words, one needs to estimate IRA elasticities of demand, and hence demand functions for British imports, in each of the key markets.

Following our earlier discussion, the demand functions estimated in this section take the log-linear form

$$lnIMPORTS_{jt} = \alpha_0 + \alpha_1 lnGDP_{jt} + \alpha_2 lnIRA_{jt} + \alpha_3 lnPRICES_t + \alpha_4 lnD1 + \alpha_5 lnD2 + \alpha_6 lnD3 + u_t$$

where $IMPORTS_{jt}$ is the sterling value of British imports to market j in year t expressed in constant 1913 prices; GDP_{jt} the level of real GDP in j in 1913 pounds; IRA_{jt} an instrument variable for the index of relative advantage for British imports in j;[8] and $PRICES_t$ a measure of the relative price competitiveness of British exports. [9] *D1*, *D2*, and *D3* are a series of dummies used to capture structural changes in Britain's relationship with the international economy. u_t is the error term.

$PRICES_t$ is constructed as the ratio of average British to USA export prices, a measure that has been used to gauge changes in the price competitiveness of British industrial exports (Greasley and Oxley, 1996, p. 89). Such a comparison between British and American prices is justified because for the entire period under consideration, the USA was consistently the most technologically dynamic and productive of all of Britain's competitors in the international marketplace. US prices, therefore, set the standard against which the British had to compete. Indeed, in most of Britain's Empire markets, especially the wealthy Dominions, the US was in fact the only serious rival to Britain's dominance (Platt, 1993, especially pp. 110-3).

Dummy variables are included in the demand function to acknowledge the possible effect of structural changes in the world economy induced by wars and other major events between 1870 and 1960. At various junctions during this period, concurrent changes in *inter alia* exchange rate regimes, the form and scope of protectionism, and macroeconomic policy in Britain and elsewhere dramatically altered the nature of the international economy. Given the integrated nature of many of these transformations, however, isolating the effects of any specific change is problematic. For example,

when markets are non-competitive or when the extent of protective measures, both of the tariff and non-tariff variety, is altered, trade theory indicates that the exchange rate pass-through of an appreciation will not be perfect (Bhagwati, 1988; Menon, 1996, chs. 2 and 3). In other words, a 5 per cent appreciation of the pound can be expected to result in a less than 5 per cent decrease in British price competitiveness in foreign markets. In such circumstances, dummies, that gauge the net effect of all of the concomitant changes in process, may capture the impact of the transformation in exchange rate regimes better than exchange-rate adjusted export prices.[10] This is the approach adopted in this paper.[11] *D1*, thus, represents Britain's return to the Gold Standard at the pre-war parity between 1925 and 1931; *D2* the impact of the Depression and its consequences between 1929 and 1938; and *D3* the postwar world up to 1960.[12]

The result of ordinary-least-squares estimations of the demand functions for six important British markets for all war-unaffected years between 1870 and 1960 are given in Table 3.[13] The first thing to note from Table 3 is that each of the six estimated demand functions can account for between 68 and 96 per cent of variation in British import volumes to those markets in this period. Moreover, these regressions are also fairly robust, exhibiting no significant signs of autocorrelation, hetereoscedasticity, multicollinearity or specification bias.[14]

The key independent variables are all significant and of the expected sign in every regression in Table 3. Some differences between markets, though, are apparent. Argentina was the most sensitive with respect to changes in the level of GDP, India the least. Price competition was at its most acute in Canada, Argentina and America,

though seemingly less of a pressing issue in Australasia and British India. Variation is also found in the IRA elasticities of demand that vary from 0.3431 in New Zealand through to 0.6081 in the USA. Thus, according to these estimates, the growth of British export growth to New Zealand – the country consistently with the highest IRA in Table 1 – was surprisingly unresponsive to alterations in the imperial advantage the British experienced there. This finding emphasizes the need to draw a distinction between the level and the rate of change in the IRA of any particular Empire market. Conversely, America's relatively high IRA elasticity of demand indicates not an American preference for British wares per se, but the fact that commercial policies and industrial development in non-Empire markets also impacted the comparative ability of British exporters to penetrate different markets. The degree of advantage enjoyed in a market is not an attribute restricted to formal and informal Empire, nor one that can be truly studied in isolation. Finally, the coefficients on the dummy variables in each regression suggests that structural realignments of the global economy, especially between 1929 and 1938 and after 1945, did have major impacts on the level of British exporting to all of the markets considered in this paper.[15]

How important, then, were non-market advantages to Britain's drift towards certain Empire markets after 1870? Using the estimates of long-run elasticity derived from Table 3 and the growth rates of each of the key variables, one can determine for different periods the approximate contribution of imperial advantage to the growth of British import demand in each of the six markets considered. These estimations are presented in Tables 4 through to 9. The periods reported have been chosen because they represent periods of either uninterrupted growth or decline in British export volumes to those markets. It should be noted that since these contributions are

calculated on the basis of estimated elasticities and average growth rates, they cannot be expected to add up exactly to the observed rate of export growth. Nevertheless, the figures presented do give a very clear indication of the relative contribution of the different variables to British export growth.

Four stories emerge from Tables 4 to 9. In the Australasian markets, GDP growth accounted for the vast majority of British import growth up until 1913. Indeed, between 1870 and 1913, GDP was over fifteen times more important in New Zealand and twelve times more important in Australia than IRA in explaining British import growth. Price competition was also relatively muted in these markets in this period. After the First World War, however, the IRA became an important determinant of the growth of British imports to Australasia. GDP growth also remained important in the interwar period, especially in New Zealand, though price competitiveness, significant in the 1920s, became a relatively minor determinant after the Ottawa Agreement. This importance of the IRA was retained and strengthened in the years immediately following the Second World War. By the latter half of the 1950s, however, the influence of advantage had subsided and GDP growth had reasserted itself as the dominant factor.

The pattern was similar in Argentina and Canada for much of the period investigated. Up to 1932, GDP growth was by far the most important determinant of British imports in these markets. In fact, taking the period 1870 to 1913 as a whole, the growth of IRA in Argentina increased British exports to that market on average by just 0.01 per cent per annum. In Canada, on average it actually reduced export growth by 0.02 per cent. While the role of the IRA in Canada grew stronger in the 1920s, in

both countries it is not until after Ottawa that its importance even begins to approach that of GDP. At this time, price competition, which had been influential in the 1920s, is seen to have played little role. In the immediate postwar environment, Argentine experience diverged from Canadian. While IRA was a crucial factor in both countries between 1947 and 1952, in Argentina there was, with among other things the advent of the Peronists, a dramatic hardening of the market that saw British export severely curtailed. By the latter half of the 1950s, the relative advantage of British products had recovered, though, as Table 1 indicated, this may have only been a short-run recovery. By contrast, the contribution of the IRA in Canada between 1952 and 1960 had diminished considerably. As in the other Dominions, Canadian demand for British imports increasingly became governed by income growth and, to a lesser extent, price competitiveness.

GDP growth was also the most important factor in the USA till 1932. Relative advantage, however, exhibited an equally marked and strong influence as prices. Prior to the First World War, movements in America's IRA decreased its imports of British goods on average by 0.21 per cent each year: a testimony, perhaps, to the growing protectionism and industrial might of the United States. Following the war, American IRA turned in favor of British imports, though most British export growth of the 1920s can be attributed to the expansion of GDP and the price competitiveness of British manufactured products. From the 1930s, however, the IRA became the single most important factor in Britain's export relationship with America, a reflection of both Britain's need to service its war debts to America and the growing interdependence of these two large industrial economies.

Of the markets considered in this paper, the experience of British India was *sui generis*. Between 1870 and 1935, the IRA was the dominant factor explaining British import levels. It is a dominance that gathered strength across the interwar period, reaching its apogee in 1925 to 1927 when its effects were over three and a half times more important than both GDP and prices combined. As such, of all of Britain's main Empire markets prior to the Second World War, India appears to fit most neatly into the category of 'soft' market. It is also noteworthy of this period that relative to other markets, the growth of GDP played a less important role in shaping demand, a reflection of the Indian markets lower level of development. With the advent of independence, British exporters' prior advantages in India rapidly disappeared, such that by the 1950s, the demand for British imports there, as in many other countries, was being overwhelmingly driven by GDP growth and price competitiveness, a finding that suggests that source of much of Britain's former advantages in India may have been official and institutional by nature.

V.CONCLUSIONS

Between 1870 and 1955 British products destined for Empire and Commonwealth markets grew both in volume and as a proportion of all British exports. It has often been presumed that this was due to the relative advantages British producers enjoyed in these markets. This paper uses quantitative techniques to investigate this presumption, in the process shedding new light on the nature of British imperial trade. It has found that international markets in the nineteenth and twentieth-centuries were indeed not completely 'neutral'. Calculations of relative advantage in a number of Empire and non-Empire market, for example, have confirmed the view of

contemporaries and some scholars that right through to 1960 Empire markets did devote a disproportionately large portion of their incomes to British imports, indicating a possible role for non-market factors in Britain's nineteenth and twentieth-century trade history. Of the markets surveyed, the Dominions – Britons' homes away from home – evinced these features the most strongly. Yet, by 1980, other than in New Zealand, such advantages had totally evaporated in all of these markets, a telling indication of their ephemerality. That such pro-British advantages existed is one thing; it is, however, in itself not a sufficient explanation for Britain's imperial drift. This is because if such non-market advantages are to account for the steady reorientation of British export efforts toward the Empire, then it is also necessary to establish that movements in Britain's relative advantage in Empire markets, and not just the levels of those advantages, were in fact correlated with British export volumes to those destinations.

The index of relative advantage proposed in this paper allows such a proposition to be directly tested. These tests suggest a quaternary periodization of the history of British exports to the Empire and Commonwealth. The first period is the years between 1870 and 1913, a period in which some have argued that imperial advantages were first consciously exploited by British exporters (Hobsbawm 1969). This belief now seems to be misplaced. Using the IRA as our gauge, the shift of British manufacturers' attention towards the Empire, especially the self-governing parts of it, in the late-Victorian and Edwardian era turns out to be more a product of the rapidly rising wealth of these largely neo-British settlements rather than their growing sense of imperial sentiment or duty, or even empathy for the plight of manufacturers back home. The tariff preferences afforded to some British-made products introduced by

the Dominions in the years prior to the First World War also do not appear to have amounted to much, at least in terms of greater volumes of British imports making their way to their shores. Indeed, in Australia and New Zealand, the first decade and a half of the twentieth century, when such measures were introduced, saw the overall level of advantage for the British good in these markets fall, not rise. Similarly, the dominance of GDP growth and relative unimportance of the IRA in the demand for British imports in the Dominions in this period implies that the comparative advantage explanation of British industry's reorientation toward Empire was not the integral factor. This is not to suggest that this and other considerations were not also at play, only that their contributions to Britain's export performance in the self-governing colonies and Argentina before 1913 were clearly of secondary importance.

Yet this largely growth-driven export drive of British manufacturers in the self-governing parts of Empire was to prove transient, coming to an abrupt end with the outbreak of the First World War. In the aftermath, a strengthening of relative advantage in all Empire markets in favor of British imports was evident. In this interwar period, the steadily increasing relative advantages experienced by British manufacturers in Dominion markets became a crucial determinant of their export success, a process that reflected the growing protectionism of the period and that was further reinforced within the ‘British’ world by the Ottawa Conference of 1932. Reliance on non-market-determined means of directing British exports towards Dominion and other Sterling Area markets gathered even further momentum in the immediate post-Second World War environment of dollars shortages, export drives and reconstruction. Between 1947 and 1952, the openness and receptiveness of Australia, Canada (even though it was not part of the Sterling Area) and New Zealand

to British imports ensured that with each year the consumption of British products to these markets increased on average by 1.14, 0.80 and 1.26 per cent respectively. This was to prove the high watermark of Britain's export dependence on its Empire and Commonwealth. Within a few years, Britain's relative advantage in most parts of the Commonwealth was in freefall, a product of the diverging interests of both Britain and its former colonies. By that time, Britain had already begun the process of gradually reorientating itself towards the more dynamic, and faster growing markets of post-reconstruction Europe; its partners in the Commonwealth, in many cases empowered with a new sense of independence and urgency, were likewise striking out in new directions. By 1960, only the last residues of economically relevant imperial advantage remained: twenty years later, even that had gone.

Thus, while cultural, political and ethnic connections, and the advantages that they engendered, mattered, they did not in themselves drive Britain's imperial drift. Other than for some thirty-odd years stretching from approximately 1920 to 1952, other factors, most notably the economic growth of the importing markets, dominated the rate at which British exports ended up in the hands of consumers in the Dominions, a finding that seriously undermines the position of those who claim to see one of the sources of Britain's waning industrial competitiveness in its escape into the featherbedded markets of Empire. Of course, the benefits of imperial and cultural affinities may have been more profound and enduring in specific industries – or probably more appropriately for individual firms – but that has yet to be established in any vigorous manner. In any case, such a finding would not alter the conclusion that overall such considerations did not have a significant role in many of the most economically important parts of the Empire and Commonwealth for most of the

period between 1870 and 1960. The exception to this rule was British India, where the advantages enjoyed by British products remained strong and influential right through to independence. Whether this proves that India and, perhaps, by extension Britain's other dependent colonies in Africa, Asia and the Caribbean did serve as a reliable 'bolt-hole' (Cain and Hopkins, 2002, p. 154) for British manufacturers fleeing foreign competition and obstructions elsewhere, or whether it was more a consequence of a naturally arising demand in these markets for products in which Britain happened to have a comparative advantage cannot be answered here.[16] Further research on the nature of these and other markets where non-market advantages seem to have mattered is clearly in order.

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Table 1. Index of Relative Advantage on selected countries, 1870-1980 (quinquennial average)

Period	Australia	NZ	Canada	South Africa	British India (I)	British India (II)	Asia (other than India)	Argentina	USA
1870-74	2.78	3.48	2.17		0.30	2.73	0.11	1.85	0.51
1875-79	3.43	4.20	2.12						0.31
1880-84	3.66	3.82	2.13						0.41
1885-89	3.87	3.80	2.20						0.47
1890-94	3.27	3.74	1.90		0.52			2.74	0.47
1895-99	3.95	4.24	1.70						0.39
1900-04	3.93	5.14	2.04		0.62	2.38	0.26	1.66	0.35
1905-09	3.16	4.59	1.90		0.72			2.13	0.32
1910-13	3.43	4.57	2.07	6.09	0.74			1.85	0.30
1920-24	3.28	4.75	1.51		0.88			1.34	0.21
1925-29	4.77	7.73	1.97		1.08			1.62	0.23
1930-34	3.33	7.65	2.54		0.81			1.48	0.18
1935-38	5.15	10.51	3.11		0.93			1.82	0.24
1946-50	6.81	10.08	2.07	8.54	1.16	0.94	1.24	1.28	0.14
1951-55	8.49	14.84	2.65	9.36	1.03	0.82	1.25	0.53	0.21
1956-60	6.06	11.78	2.85	7.49	1.15	1.39	0.83	0.62	0.32
1961-65	3.94	7.40	1.87	5.48	0.60	0.86	0.70	0.47	0.26
1966-70	2.91	4.79	1.41	4.69	0.24	0.50	0.48	0.27	0.34
1971-75	1.75	3.32	0.96	3.08	0.19	0.56	0.34	0.18	0.28
1976-80	0.83	1.41	0.39	1.32	0.11	0.48	0.23	0.10	0.17

Sources: See footnote 6.
Note: Before 1900 the British Indian, Asian and Argentine figure is based on 1870 and 1890 data alone. Similarly, the South African figure for 1910-13 is based on data from 1913 only.

Table 2. Index of Relative Advantage in Cotton piece goods and iron and steel in selected countries, 1871-1937

			Cotton Piece Goods			
	Australia	**NZ**	**Canada**	**British India**	**Argentina**	**USA**
1871	2.68	1.83	3.27	2.39	9.07	1.18
1890	7.17	8.92	2.26	8.47	8.04	0.56
1913	10.68	11.63	5.11	15.51	8.92	0.25
1928	12.64	13.58	2.41	12.18	7.68	0.26
1937	28.07	32.70	9.93	5.21	13.28	0.19
			Iron and Steel			
	Australia	**NZ**	**Canada**	**British India**	**Argentina**	**USA**
1871	1.98	2.26	9.56	0.21	5.76	2.95
1890	5.02	5.35	8.36	0.90	18.50	1.03
1913	9.87	18.20	4.11	3.07	8.87	0.28
1928	13.02	28.39	4.33	5.61	13.25	0.24
1937	7.93	38.50	11.61	2.64	11.09	0.02

Sources: See Table 1.

Note: The British Indian and Argentine figures for 1871 use 1870 GDP data.

Table 3. The demand for British imports in selected countries, 1870-1960

Independent variable	Australia	NZ	Canada	British India	Argentina	USA
Constant	1.5433 (0.88)	1.2602 (0.67)	4.1273 (0.78)	1.9651 (1.18)	4.7278 (1.32)	2.6160 (1.27)
GDP	0.9887 (0.10)	1.010 (0.06)	0.9693 (0.05)	0.7478 (0.25)	1.2149 (0.18)	0.9336 (0.07)
IRA	0.5198 (0.11)	0.3431 (0.10)	0.3626 (0.10)	0.4415 (0.15)	0.5274 (0.11)	0.6081 (0.12)
PRICES	-0.85249 (0.20)	-0.6521 (0.16)	-1.2608 (0.14)	-0.6691 (0.16)	-1.7877 (0.33)	-1.1136 (0.25)
D1	-0.0812 (0.08)	-0.0555 (0.06)	-0.0655 (0.05)	0.0282 (0.07)	-0.0642 (0.09)	-0.1399 (0.10)
D2	-0.4818 (0.08)	-0.2284 (0.07)	-0.1238 (0.07)	-0.4749 (0.07)	-0.4026 (0.10)	-0.5739 (0.10)
D3	-0.2485 (0.15)	-0.0897 (0.13)	0.0775 (0.11)	-0.4804 (0.14)	-0.5542 (0.19)	-0.4332 (0.15)
R2(adj)	0.8590	0.9630	0.9522	0.8185	0.8567	0.6864
SEE	0.1812	0.1369	0.1165	0.1335	0.1922	0.2186
DW	1.76	1.45	1.58	1.44	2.30	1.92
Geary	35, 38, 37	31, 35, 39	35, 35, 39	19, 22, 22	21, 21, 22	32, 42, 33
BG	21.831 (23)	19.413 (23)	23.422 (23)	9.695 (13)	10.749 (10)	12.193 (23)
RESET	1.8218	2.6603	2.7141	0.2219	0.0479	0.3199
Arch	0.001	0.187	2.792	0.313	0.525	2.541
Harvey	4.067	7.284	3.675	1.431	4.026	2.505
Koenker	9.033	8.471	9.194	7.824	9.089	11.486
N	75	74	74	44	43	75

Sources: See footnotes 6 and 9.

Notes: Standard errors are given in parenthesis. *SEE* is the standard error of the estimate. *DW* is the Durbin-Watson *d* statistic for serial correlation in autoregressive models. *Geary* is the Geary runs test, a nonparametric test for autocorrelation. The first value given is for the total number of runs, the second the number of positive runs, and the third the number of negative runs. *BG* is the Breusch-Godfrey general test for autocorrelation. The *BG* test statistic and the degrees of freedom (in parenthesis) have been given. *RESET* is a test for errors in the functional form of the regression that is based on the square of the fitted values. *Arch* is a test for heteroscedasticity that is calculated from the regression of the squared residuals on the lag of the squared residuals. *Harvey* is a test for heteroscedasticity that is calculated from the regression of the log of the squared residuals on the value of the independent variable. *Koenker* is a test for hetroscedasticity that is calculated from the regression of the squared residuals on the squared estimated values of the regressand. *Arch, Harvey, BG, RESET* and *Koenker* are all distributed as chi-square. All of the test statistics for hetroscedasticity have 6 degrees of freedom. *N* is the number of observations. All war years have been removed for the regression. The Indian and Argentine regressions are estimated for all available normal peacetime years between 1900 and 1960.

Table 4. Contributions of IRA, GDP and Prices to British export growth to Argentina, 1870-1960 (average annual percentage)

Period	Export Growth	IRA	GDP	Prices
1870-1900	1.68	-0.07	2.44	-0.46
1901-1913	2.13	0.23	1.62	-0.13
1870-1913	1.81	0.01	2.25	-0.36
1921-1928	2.24	0.07	1.53	1.13
1932-1937	2.62	1.09	1.15	-0.20
1947-1952	-4.94	-2.29	0.17	-1.84
1953-1960	4.36	1.79	0.76	0.31

Sources: See Table 3.

Table 5. Contributions of IRA, GDP and Prices to British export growth to Australia, 1870-1960 (average annual percentage)

Period	Export Growth	IRA	GDP	Prices
1870-1900	1.14	0.15	0.88	-0.22
1901-1913	0.65	-0.23	0.94	-0.06
1870-1913	1.02	0.07	0.88	-0.17
1921-1928	2.39	0.67	0.30	0.54
1932-1937	2.05	0.97	0.96	-0.09
1947-1952	3.44	1.14	0.91	-0.88
1952-1960	0.28	-0.31	0.76	0.21

Sources: See Table 3.

Table 6. Contributions of IRA, GDP and Prices to British export growth to Canada, 1870-1960 (average annual percentage)

Period	Export Growth	IRA	GDP	Prices
1870-1900	0.50	-0.07	0.88	-0.32
1901-1913	1.83	0.08	1.26	-0.09
1870-1913	0.93	-0.02	1.04	-0.25
1921-1928	4.04	0.42	1.61	0.80
1932-1937	1.85	0.48	0.99	-0.14
1947-1952	3.30	0.80	0.81	-1.30
1952-1960	1.18	0.10	0.66	0.32

Sources: See Table 3.

Table 7. Contributions of IRA, GDP and Prices to British export growth to India, 1870-1960 (average annual percentage)

Period	Export Growth	IRA	GDP	Prices
1870-1900	0.67	0.21	0.12	-0.17
1901-1913	1.06	0.27	0.15	-0.05
1870-1913	0.90	0.28	0.13	-0.14
1925-1927	1.29	0.91	0.12	0.13
1933-1935	1.35	0.79	-0.01	0.49
1947-1951	-0.64	-0.11	0.003	-0.74
1953-1960	0.71	-0.01	0.59	0.11

Sources: See Table 3.

Table 8. Contributions of IRA, GDP and Prices to British export growth to New Zealand, 1870-1960 (average annual percentage)

Period	Export Growth	IRA	GDP	Prices
1870-1900	1.68	0.10	1.35	-0.17
1901-1913	0.99	-0.04	0.91	-0.05
1870-1913	1.52	0.08	1.22	-0.13
1921-1928	2.64	0.49	0.40	0.41
1932-1937	2.39	0.45	1.58	-0.07
1946-1951	3.89	1.26	0.62	-0.50
1952-1955	1.36	-0.11	1.07	0.14

Sources: See Table 3.

Table 9. Contributions of IRA, GDP and Prices to British export growth to the USA, 1870-1960 (average annual percentage)

Period	Export Growth	IRA	GDP	Prices
1870-1900	0.36	-0.23	1.04	-0.29
1901-1913	0.61	-0.16	0.65	-0.08
1870-1913	0.47	-0.21	0.98	-0.22
1921-1928	2.12	0.20	0.87	0.71
1932-1937	3.28	1.33	1.15	-0.12
1946-1952	4.80	2.83	0.68	-0.85
1954-1960	2.49	1.30	0.43	0.24

Sources: See Table 3.

ENDNOTES

[1] The importance of such intangible, non-tariff factors can be seen in the recent history of US-Japan trade, where, despite Japan's low tariffs, the US exporters have found it difficult, because of high domestic trade costs, to penetrate Japanese markets. See, for example, Czinkpota and Woronoff (1986, ch. 4) and the essays in Krugman (1991).

[2] See for example, Saul (1960, p. 229); Hobsbawm (1969, p. 192); Kindleberger (1961-2, pp. 295-300); Crouzet, (1982, p. 357); Barnett (1995, p. 12); Owen (1999, pp. 185-187), and Thompson and Magee (2003).

[3] The relativity of this index is appropriate, since the full extent of the advantages that are derived from being part of the British Empire or 'world' can only be perceived within a global context. After all, what determines the attractiveness of Empire or Commonwealth markets is not just their pro-British tastes, institutions and policies, but that the fact these same attributes are not shared to the same extent in other markets. Thus, from the perspective of the British exporter, the extent of the advantages they enjoy in New Zealand is influenced by the nature of Britain's relations not just with New Zealand itself, but also with consumers, producers and governments in other potential markets both inside and outside the Empire. If governments in non-Empire markets decide to impose hefty tariffs on British exports, *ceteris paribus*, one would presume from the British point of view that this would make the New Zealand market more advantageous than before, even though nothing has actually changed in New Zealand itself. In a world of growing international trade, the benefits of empire cannot be determined in isolation.

[4] Given the enduring cultural, legal and linguistic similarities between America and Britain, it would be inappropriate to use the US as our 'neutral' market.

[5] The interconnections were numerous and layered. For example, British investment in a colony like Australia was in part influenced by the fact that English was spoken there, that communication and transport networks with the UK were well developed and reliable, and that legal, business, and political traditions and practices were similar. These positive features in turn were the product inter alia of the large number of British immigrants that continued to emigrate to Australia, who, themselves, had in part been encouraged to go there by the inherent 'Britishness' of the place. The common factor that bound all of these considerations together, therefore, was membership of the British Empire or 'World'. This paper's utilization of a composite index is thus not only practical, but desirable. Admittedly, while the IRA allows important questions like the net effect of imperial advantages to be addressed, its chief disadvantage is that it is not able to distinguish between the relative contributions of each source of advantage. As already indicated, however, such a hypothetical decomposition is made practically impossible by the major data problems involved.

[6] The export data used in Table 1 come from the *Annual Statement of the Trade and Navigation of the United Kingdom* and Mitchell (1988), table 16, pp. 505-512 and pp. 453-4. British export prices are based on Imlah's series up to 1913, and the Board of Trade series after 1913. Both are found in Mitchell (1988), table 23 parts A and B, pp, 526-7; Population, real GDP, and GDP per capita data come from Maddison (1995), appendix D, esp. tables D-1a, D-1d, D-1e, pp. 191-206. All values have been converted to 1913 British pounds.

[7] There are other possible reasons. McKenzie (2002) has argued that disagreements between the dominions and Britain over trade negotiations in the 1940s acted to

prompt a greater independence and self-assertiveness in dominion policy from this time. Increasing British FDI in the Commonwealth may well have also contributed to the reduction of export demand. See Nicholas (1989).

[8] Because the IRA is partially determined by the volume of British exports, an instrument variable was employed. The instrument variable used for the Indian, Canadian, Argentine and New Zealand regressions was the lag of the IRA index. For the Australian and US regressions an alternative IRA index, which incorporated an estimated, rather than the actual, value of British exports, proved slightly more efficient. The estimate of British exports was derived from the average of the value of exports in both the immediately preceding and succeeding years.

[9] US export prices for manufactured exports Lipsey (1963), A-1, pp. 142-3. See footnote 6 for other sources.

[10] When the regressions reported in Table 3 are run using exchange-rate adjusted export prices, the coefficient on this relative price variable is in all cases (both with and without the dummies) not statistically different from zero. By contrast, the unadjusted *Prices* variable is strongly significant when used in conjunction with dummies. Such a finding is consistent with the argument that the exchange rate pass-through is less than perfect.

[11] Utilizing such dummies has other advantages as well. All of the variables in this analysis have a unit root, indicating that a levels estimation may create spurious results. A feature of unit root tests, however, is that they presuppose a constant parameter structure over the entire period investigated. When this presupposition does not hold, it has serious consequences for the validity of the test results produced. Specifically, it has been demonstrated that when structural change occurs in a time series, standard unit root tests are biased toward the acceptance of the unit root

hypothesis and, hence, are unreliable. Thus, as Maddala (2001, p. 555) has pointed out, 'when using long time series … it is important to take account of structural change'. Indeed, when such parametric shifts have occurred, the application of unit root tests to the data can – and very often does – erroneously make a trend stationary series appear difference stationary. On this, see, for example, Perron (1989, pp. 1361–3; Rudebusch,(1993, pp. 264–5); Diebold and Senhadji, (1996, p. 1297); and Maddala and Kim (1998, ch. 13). One of the implications of this finding is that when a time series has periods in which a profound transformation is suspected to have taken place, such as during the depression of the late 1920s and 1930s (Chow tests of each of the variables for every country examined in this paper in fact confirm at the 1 per cent level that a structural break in the trend did occur in 1929) the use of traditional multiple regression analysis, with dummies allowing for structural changes, is an appropriate methodology. See Rappoport and Reichlin (1989, p. 168); Maddala (2001, p. 555); and Gujarati (2003, p. 819).

[12] A dummy representing the turbulent postwar period of 1919-24 was also tested but has been excluded from the estimations presented in Table 3 since it proved to be insignificant and negligible in every market.

[13] A South African import demand function is not estimated here simply because no continuous GDP series is available prior to the Second World War.

[14] The DW statistic for the Australian, New Zealand, Canadian and Indian regressions are indecisive. Clearer results, however, were achieved with other tests. Thus, the BG test could not reject at any of the critical values the null hypothesis that there was no autocorrelation in any of the regressions. Moreover, in all cases, the pattern of runs observed in the residuals was consistent with a random distribution. Non-parametric analysis of the residuals, therefore, also rules out the presence of any significant

autocorrelation. See Gujarati (2003, pp. 462-74) for a discussion of these different tests of autocorrelation.

[15] Chow tests of each regression also indicate at the 1 per cent level that a structural break took place after 1929.

[16] It is worth noting in this regard that Tomlinson (1993, pp. 107, 111-3) argues against any alleged favoritism granted to British businesses by the Raj.