NEW COMMONWEALTH IMMIGRATION
AND WELFARE EFFECTS
ON THE UNITED KINGDOM ECONOMY

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by

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ABSTRACT

This thesis is a theoretical and empirical examination of the impact of New Commonwealth immigration during 1951-66 on the welfare of the indigenous population of the United Kingdom.

Chapter I concentrates mainly on the pattern of New Commonwealth immigration in the post-war period and the effect of immigration laws. The experiences of the other West European countries are also briefly examined.

Chapter II surveys previous theoretical analyses of the welfare implications of immigration.

Chapter III surveys the empirical literature on the economic impact of immigration with particular reference to the United Kingdom and West European experience and points to the differences in approach between that of the empirical researchers and the theoretical models discussed in Chapter II.

Chapter IV builds upon the work of the previous theoretical contributors and develops a framework that will enable the empirical estimation of the welfare impacts. A distinction is made between the non-traded and traded sectors, and for each of these sectors certain modifications are introduced to make the analysis more relevant for the United Kingdom experience: these include the provision of welfare services and tariffs and taxes.
And finally, Chapter V presents the empirical estimates. The research suggests that immigration brought a small welfare loss for the indigenous population of the United Kingdom: the magnitudes are between 0.14 per cent and 0.24 per cent of the net output of the sectors examined. An important point revealed by the research is that the losses/gains depend on the industrial distribution of immigrant workers.
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CHAPTER I

POST-WAR DEVELOPMENTS IN WEST EUROPEAN IMMIGRATION
INTRODUCTION

International labour migration has a long history, and has been due to various factors. Towards the end of the Roman Empire large groups of Goths, Vandals and other tribes migrated to Europe because of the drying up of grazing grounds in central Asia. Since the 16th century the major long-distance migration has been from Europe to the Americas. At first this involved individuals or small groups who wished to escape political or religious persecution, but subsequent migration has been mainly due to a desire to obtain a higher economic standard of living.

The heyday of international migration was in the half century before the First World War during which period over 50 million people migrated.¹ This migration was predominantly from Europe to the Americas and to the colonies, though there was also considerable intra-European migration. Migration to the newly discovered regions, which was paralleled by capital movements, was employed on the plentiful land in those countries and was of considerable importance in their economic development. It also benefited the European countries through the production of cheap food and raw materials that it made possible.

The importance of intra-European labour migration was in its contribution to the growth of industrialization. A basic precondition

¹Up to 1860, the majority of these emigrants (66%) came from Britain. A further 22% came from Germany. After 1860, the largest contingents of overseas migrants came from Italy, Spain, and Eastern Europe. The peak of the overseas exodus was reached at the turn of the century; from 1880 to 1914 the U.S. received 22 million immigrants.
for industrialization in the 19th century Europe was the existence of labour reserves. Peasants and artisans who had lost their livelihood through competition from the new capitalist methods of production flooded into the new industrial towns, often in foreign countries, to become part of the labour force. For example, in Britain the increasing demand for labour generated by the industrial revolution was initially met from the surplus of unemployed workers from the countryside. Later on British employers turned their eyes to Ireland. (In addition the Irish famine of 1822 sent tens of thousands of peasants to England in search of bread). By 1851 there were 727,000 Irish immigrants in Britain (concentrated in cities like Liverpool, Manchester and Glasgow) forming a high proportion of labour force in unskilled textile occupations and in the building trades.

Britain was not the only country in Europe which experienced immigration in the 19th century. In France, Germany and Switzerland too once the landless rural labour force could no longer meet the demand for labour in the new industrial areas, foreign labourers were brought in. At first most of the immigrants came from neighbouring areas. Later, immigrant workers were employed by industry and were attracted away from the frontiers, to Paris, Lyon in France, and to the Ruhr and the eastern parts in Germany. (In 1907 there was a total of 800,000 foreign workers in Germany, and they made up 4.1 per cent of the total labour force).

In addition to these movements there was the migration caused by political changes: for example, the 120,000 Jews who settled in Britain between 1875 and 1914 were refugees who left Russia to escape persecution. The First World War disrupted the migratory patterns which had been developing throughout Europe for the previous five or six
decades. Thousands of more or less firmly established immigrants left Germany, France and Switzerland. Only in Britain were the main immigrant groups unaffected - except the citizens of German or Austrian extraction. At the same time, countries like France and Britain which suffered considerable manpower shortages during the war began to recruit workers in their colonies.

During the interwar period, migration to most Western European countries was on a considerably smaller scale than before the First World War. However, in Germany the change to a centrally directed war economy after 1933 led to a renewed demand for labour and, as a result, agreements for the recruitment of labour were made with neighbouring countries; in addition during the war very large numbers of foreign workers were used to replace the eleven million German men withdrawn from the labour force for military service.

Development of Migration Since 1945

Since 1945 millions of people have migrated from the underdeveloped parts of Southern Europe, Africa, Asia and South America to Western Europe. The reasons underlying these migratory movements have varied considerably. There have been the expatriates returning home from the former empire and colonies (e.g. Englishmen from India and Pakistan, the French from Algeria and the Dutch from Indonesia) and also hopeful immigrants from newly independent ex-colonies to the metropolitan countries (i.e. Britain, France, and Holland). In addition there have been 'political' emigrants: East Germans to West Germany, Hungarians and Czechs to many West European countries, and Asians from the former East African colonies to the United Kingdom.
The most important category, however, has been workers from the countries of the British Commonwealth to the United Kingdom and from the less industrialized South European countries to their Northern neighbours.

The precise number of foreign migrants in Western Europe is not known with certainty. Hume estimated, that there were about 9 million such immigrants in 1971, of whom about 8 million were workers. According to Castles and Kosack the total of immigrants into Western Europe amounted to 10.8 million, although most of the national data on which this estimate was based were for years before 1970. In January 1974, the European Commissioner for Social Affairs estimated the number of migrant workers at 11.5 million. The main countries of immigration have been France and Germany; these two countries have over three-quarters of Western Europe's foreign workers, who originated from the Mediterranean recruitment countries, followed by Switzerland, Austria, Belgium and the Netherlands.

Post-War Immigration into the United Kingdom

The post-war immigration into the U.K. may be divided into three principal flows: from the Irish Republic, from foreign countries and from the Commonwealth.

As mentioned above, the Irish have been coming to this country since the early 19th century, and are the largest single immigrant nationality in the U.K. During the Second World War the demand for 1

\[1\text{I.M. Hume, Some Economic Aspects of Labour Migration in Europe since World War II, cited by Suzanne Paine, Exporting Workers: The Turkish Case, CUP, 1974.}\]

\[2\text{Castles and Kosack, Immigrant Workers and Class Structure in Western Europe, IRR, OUP, 1973.}\]
labour in the U.K. led to direct recruitment in Ireland, and after
the War a strong current of immigration continued, though falling
steeply in the sixties.

The immigrants from foreign countries were mainly European workers,
recruited by the Ministry of Labour to alleviate labour shortages in
Britain\(^1\). They consisted of three groups: 100,000 members of the
Polish armed forces, their dependants, and 85,000 persons of many
nationalities.

The basic feature of the post-war migratory trends, however, has
been the rapid enlargement of the proportion of Commonwealth and
colonial immigrants: it rose from about 22 per cent in 1951 to 29 per
cent in 1961 and 38 per cent in 1966\(^2\). Another, and more important,
feature is that this rise in the share of the Commonwealth has been
wholly accounted for by immigration from the New Commonwealth
countries. (This is in fact why I wanted to examine the welfare
implications of New Commonwealth immigration in the empirical chapter
- i.e. Chapter V). The first arrivals came from the West Indies
early in the fifties - many of them had worked in the war industries,
particularly in factories on Merseyside.

With the growth of the British economy and the shortages of
labour (and the increasing stringent controls on immigration to the
U.S.A.) the numbers increased steadily: by 1956 the annual rate of
immigration was 30,000. The rate declined in the late fifties due to

\(^1\) Since 1951 there has been no organized recruitment of labour.

\(^2\) K. Jones and A.D. Smith, the Economic Impact of Commonwealth
the recession in Britain, but numbers soon picked up again: some 98,000 persons immigrated between the beginning of 1961 and the middle of 1962. Immigration from India and Pakistan got under way later than the West Indian current but also leapt to a very high level after 1960. Net inward immigration from the New Commonwealth between 1955 and 1968 totalled 669,640 - this included 200,130 Indians, 145,960 Pakistanis, 191,330 Jamaicans, and 132,220 persons from the rest of the Caribbean.

The latest available estimates show that in 1971 the total New Commonwealth population was 1,121,440 showing an increase of nearly 50 per cent over 1966. It has also been shown that during the same period there has been a relatively low increase in the overseas born New Commonwealth immigrants, and a relatively high increase in the numbers born in this country.

Table I summarizes most of what has been said so far.

Post-War Immigration Into Other West-European Countries

The immigration patterns experienced by other important Western-European immigration countries have shown certain similarities to the British experience. In France immigration was high in the five immediate post-war years, but economic conditions led to a slow-down of the increase in arrivals from the West Indies and the Indian subcontinent reflected the anticipation of legislation on immigration control. The implications of this will be considered below.

1 See, Colour, Citizenship and British Society, by Nicholas Deakin, London Panther, 1970, p.52. It should be noted here, however, that throughout the postwar period, considerable numbers of people have emigrated from Britain, mainly to the 'white' Commonwealth and the USA. Apart from the period 1958-63, emigration has constantly exceeded immigration.

### TABLE I


<table>
<thead>
<tr>
<th>Place of Birth</th>
<th>1961</th>
<th>1966</th>
<th>1971</th>
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<tr>
<td>United Kingdom</td>
<td>43,765,750</td>
<td>44,408,830</td>
<td>45,585,200</td>
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<tr>
<td>Irish Republic*</td>
<td>682,900</td>
<td>698,600</td>
<td>675,870</td>
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<tr>
<td>Old Commonwealth</td>
<td>99,270</td>
<td>112,560</td>
<td>128,875</td>
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<tr>
<td>New Commonwealth</td>
<td>282,090</td>
<td>829,750</td>
<td>1,121,440</td>
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<tr>
<td>'Coloured'</td>
<td>239,690</td>
<td>729,910</td>
<td>1,002,740</td>
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<tr>
<td>'Non-coloured'</td>
<td>42,400</td>
<td>99,840</td>
<td>118,700</td>
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<tr>
<td>Foreign Countries: in Europe</td>
<td>519,610</td>
<td>559,850</td>
<td>603,420</td>
</tr>
<tr>
<td>America</td>
<td>109,990</td>
<td>105,020</td>
<td>120,055</td>
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<tr>
<td>Elsewhere and not stated</td>
<td>564,360</td>
<td>358,870</td>
<td>417,210</td>
</tr>
<tr>
<td>Visitors to U.K.</td>
<td>82,590</td>
<td>62,030</td>
<td>97,505</td>
</tr>
<tr>
<td><strong>Total (all countries of birth)</strong></td>
<td><strong>46,106,560 100</strong></td>
<td><strong>47,135,510 100</strong></td>
<td><strong>48,749,575 100</strong></td>
</tr>
</tbody>
</table>

*Including Ireland, part not stated.

**Sources:**
- 1961 Census, Birthplace and Nationality Tables
- 1966 Sample Census, Summary Tables
- 1971 Census, Population and Birthplace Tables

immigration in the early fifties, followed by a substantial increase in 1956-58. The anti-inflationary measures of 1958 caused a new decline in entries, but immigration picked up again after 1961. In both 1964 and 1965 over 150,000 new workers entered France. The figure then dropped again to about 90,000 in 1968. But 1970 witnessed the record number of new immigrant workers totalling 174,245. In addition to the temporarily recruited workers, large numbers of seasonal workers have also been recruited every year, mainly to be employed in agriculture for six to nine months.

Due to the war destruction, economic disorganization and eight million expellees from the lost eastern provinces, West Germany had considerable unemployment in the early second half of the 1940's. Economic recovery after the 1948 currency reform was so rapid, however, that all the unemployed were soon absorbed into the labour force, and by the late fifties serious labour shortages were being felt. Initially, most of the relatively small number of foreign workers came from the neighbouring countries of Austria and the Netherlands. Later on, however, growing labour needs led to the organized recruitment of labour abroad. (The first agreement was concluded with Italy in 1955. Spain and Greece followed this in 1960, Turkey in 1961, Portugal in 1964, and

1 See S. Castles and G. Kosack, Immigrant Workers and Class Structure in Western Europe, IRR, 1973, p.32.

2 It should be noted here, however, that in the beginning there was an unspoken assumption that Germany was not a country of immigration. It considered the import of foreign labour as a temporary expedient with which to overcome unusual demand pressure and believed that the migrants would return home when the economy returned to its normal pace. The economic recession of 1967 seemed at the outset to confirm the original notion of Konjunkturpuffer, i.e. the import of foreign labour when it is needed during a boom and its re-export during a recession.
Yugoslavia in 1968). In the early sixties the foreign labour force reached the million mark, and by 1956 there were 1.3 million foreign workers. The recession of 1966-7 caused a sharp cut-back. Then economic recovery brought a new wave of immigration, more rapid than ever. In 1969, 646,000 new foreign workers entered the country, and by the autumn of 1970 the foreign labour force totalled over two million.

Switzerland experienced an intense shortage of labour immediately after the war, which they started to fill with readily available Italians. Throughout the post-war period the Italians have remained the biggest immigrant group. (Their share in the foreign population was 55 per cent at the end of 1969). Large groups of immigrants have also come from Germany, France, and Austria, but their share in the foreign population has declined fairly steadily, while the number of immigrants from more distant countries like Spain, Greece, Yugoslavia and Turkey has significantly increased. Immigrants from this latter source mostly came through recruitment agreements concluded with these countries.

The temporarily recruited migrants serve the same purpose in the labour importing countries. They are usually recruited on the basis of a fixed period employment contract: it is expected that, in the normal course of events, the migrant will return to his country of origin after his contract has elapsed; if the host country still faces a labour shortage, the migrant is usually replaced by another foreign worker. He is recruited solely because of his ability to work, and is discouraged from bringing non-working dependants.

Legal Conditions of Entry and Problem of Citizenship

This section examines the evolution of the United Kingdom
legislation pertaining to immigration and the effects of these on the pattern and composition of immigration.

The British Nationality Act of 1948 established two broad categories of British citizenship: citizens of Independent Commonwealth countries and citizens of the remainder of what had been the Empire described for the purpose as citizens of the United Kingdom and Colonies. Immigrants from the Independent Commonwealth countries and from the Colonies enjoyed the right of free entry and were assumed to possess full civil rights.

This situation continued through the 1950’s. In 1962, however, the British government introduced the Commonwealth Immigration Act which modified the definition of citizenship as applied to Commonwealth and Colonial subjects and also placed controls over the entry of (i) citizens of the independent Commonwealth and (ii) of those citizens of the United Kingdom and Colonies whose passports were issued locally. In addition, the civil rights of the newcomers were redefined: they became liable to deportation from the U.K. if convicted of an offence within five years of arrival. Moreover, the separation of their families by law also became possible.

The 1962 Act also introduced a system under which Commonwealth citizens intending to work in Britain had to apply for work vouchers from the Department of Employment and Productivity (then the Ministry of Labour). There were three categories of vouchers: Category A was for those with a definite offer of employment; these could only be applied

1 Controls in the form of work vouchers. The nature of these will be clearer below.
for by the would-be employer of the worker. Category B was for those possessing particular skills or qualifications and could be applied for by any Commonwealth citizen. Category C was for those people without the defined skills and without any definite jobs arranged before their arrival; the issue of 'C' vouchers ended in 1964.

Since 1962 most immigrants have been inactive wives and children, coming to join men already present. Between July 1962 and December 1968, only 77,966 voucher holders were admitted, compared with 257,220 dependants. The trends have been such that, in 1963, as much as 40% were voucher holders and only 34% dependants (the rest being students, etc.); a picture which by 1966 had changed radically to one of 8% voucher holders and 69% dependents.

Thus, the Act had an important impact on the timing, pattern, and the composition of immigration. In the period before it came into effect, immigration consisted predominantly of economically active persons. Many of these people had come here with the intention of staying for a few years only in order to save money. But after the Act many more migrants decided to remain more or less permanently and bring their families with them. The significance of the qualitative change in the composition of the immigrant community will be clearer in chapter V.

In August 1965 the Labour government issued a White Paper outlining more stringent restrictions on the rights of immigrants from the

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1 For a good examination of the effects of employment vouchers see A. Bottomley and C. Sinclair, Control of Commonwealth Immigration, Runnymede Trust publication.

Commonwealth (Cmd. 2379, Immigration from the Commonwealth, London, HMSO 1965). The White Paper placed considerable emphasis on the desirability of defining new and restricted terms under which newcomers could reside here and be permitted to bring their families to this country. It also imposed a ceiling on the total number of work vouchers to be issued annually. This was fixed at 8,500, of which 1,000 were earmarked for Malta, the rest to be distributed between all other Commonwealth countries and dependencies.¹

The 1965 White Paper can be taken as the first systematic review of immigration policy and attempt to define remedies: Part III deals with policies of integration "thus indirectly recognizing differences between two categories of British citizens",² (while part II, drafted by the Home Office, deals with restriction of immigration and the means by which it is to be controlled). Hiro is of the opinion that by recommending policies of integration, the Labour government "showed some realism on the subject"³ while Rose⁴ believes that these policies eventually proved inadequate.

In March 1968 the Labour Government curtailed the entries of East African Asians, who had been rushing to get to Britain because of the laws introduced in Kenya forbidding Asians to trade in certain areas. These Asians held British passports and had been guaranteed the right

¹It should be pointed out here that after 1965 the majority of voucher holders have been skilled workers.
³ibid. p.57
⁴E.J.B. Rose, Colour and Citizenship, p.203.
of entry by previous governments. In the words of the Opposition Green Paper on 'Citizenship, Immigration and Integration' the 1968 Act "involved breaking of a pledge given expressly or/implication to the East African Asians at the time of Kenyan independence in 1963. This pledge was that they should enjoy an unfettered right of entry into Britain so long as they retained their citizenship of the U.K. and Colonies. By relying on this pledge, many lost the right to acquire local citizenship in East Africa".¹ The Act defined people with undisputed right of entry to Britain as those having a father or grandfather in Britain². It also abridged the rights, established under the 1962 Act, of wives and children under 16 to accompany or join the head of the household in Britain: after 1968 children under 16 could enter the U.K. only if both parents live in the country. Aged, dependent parents over 65 years old, and, in some circumstances, children of 16 to 18 may come, at the discretion of the Home Secretary.³

Even before the passing of the 1968 Commonwealth Immigration Act, Britain had always followed a restrictive policy towards immigrants from non-Commonwealth countries. Foreigners wishing to come to Britain to work are issued with labour permits only if no British worker is available for the job and they may have to leave the country if they lose the job. They need permission to change jobs. They get security and freedom to change jobs only when they are 'accepted as residents' which, as the Home Office puts it,


²It may be worth mentioning here that in 1970 the European Commission on Human Rights held that Britain had discriminated on grounds of race against the Asians by passing the 1968 Act, as a result of which the Conservative Government announced in June 1971 that the number of entry vouchers available to U.K. passport holders in East Africa would increase from 1,500 to 3,000. (According to the 1968 Act the voucher is granted to the head of the family; he may bring his wife and children and parents over 65 with him).

³See 'Colour and Citizenship in the U.K.', 1969, I.R.R. Facts Paper, p.16. The same paper also informs us that the overwhelming majority of Commonwealth immigrants that have been coming to Britain after 1968 are the wives and children of heads of households resident in Britain - which, in a way, means that the effects of 1962 and 1968 Acts resemble each other.
"is usually after four years". The 1968 Act appears to put the Irish immigrants in more or less the same position as aliens.

1971 Immigration Act in effect brought the regulations for Commonwealth immigrants into line with the existing ones for aliens. (It also made the situation of immigrants in Britain similar to that prevailing in the other immigration countries of Western Europe). Under the Act the Commonwealth immigrant worker is here only to work and no longer has the automatic right to settle enjoyed under the previous Commonwealth Acts. During the first five years of the immigrants' stay in the U.K. a very tight control is exercised on where the immigrant works and abides; if the migrant becomes unemployed he may be repatriated.2

Before we consider the regulations of entry and the legal status of foreign workers in other Western European immigration countries it is in order to say a few words about the implications of joining the EEC for Commonwealth immigrants. The British position on this is, as Böhning puts it3 'very restrictive' - i.e. citizens of the U.K. and Colonies without the "right of abode" in the U.K., and this means almost all of them after the 1971 Immigration Act, do not enjoy the right to move freely through the EEC. All British dependent territories are offered association under Part IV of the Treaty of Rome. The presumption of Article 135 in Part IV is that freedom of movement shall not extend to populations in associated territories unless the Council of Ministers unanimously agrees to the contrary. Furthermore, U.K. passport holders need to qualify for inclusion in the EEC's free movement system by undergoing the residence qualification for patriality. And finally, Commonwealth citizens resident in this country are not covered by free movement simply because they are free of immigration controls or have stayed here continuously for five years or more: they have to be registered as citizens of the U.K. and colonies.

1 Ibid. p.18.

2 We consider the legal status and the industrial distribution of immigrant workers in the other Western European countries in the following pages (pp.15-21).

Legal Conditions of Entry and Problem of Citizenship in some other Western European Countries:

Although showing certain similarities, the legal conditions of entry and problem of citizenship are, on the whole, quite dissimilar in the other Western European countries. The following lines are a brief review of these aspects.

The French Government decided to encourage immigration for demographic and economic reasons immediately after the War. The Office National d'Immigration (O.N.I.) was set up in 1945 and recruitment agreements were concluded with all the main labour-supplying countries - the first country to do so in Western Europe. However, with the increasing demand for labour the system of organized labour recruitment became inadequate and the O.N.I. has lost its monopoly of recruitment. A very high proportion of foreign workers have entered clandestinely (82% in 1968). To cope with this situation the French authorities had initially evolved a process known as 'regularization': once the clandestine worker has found a job he may apply for residence and labour permits, which are granted subject to a satisfactory medical examination.

A reorientation of immigration policies in 1968 reiterated the principle that all immigrants should come through ONI but laid down that all clandestine immigrants should be deported, instead of being regularized. In 1972 and 1973 restrictions on new entrants were also introduced.

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1 See Bilan de vingt annees d'immigration 1946-66, p.9; statistiques de l'immigration 1968, cited in Castles and Kosack, op. cit., p.34.
2 See ibid. pp 32-6
Immigrants to West Germany have in theory been required to get a labour permit and visa before their arrival. In practice, however, this stipulation was not strictly enforced: during periods of severe labour shortage many migrants entered on tourist passports and obtained a work permit on finding a job. Under the policy change of March 1971 immigrants were given permits which normally allowed the migrant to work in a named workplace for one year; they had to apply for renewal of the permit. The longer the worker stayed the more rights he received: for example, after ten years of residence the worker could receive a work permit without any time limit.

In June 1973, the government introduced new regulations designed to discourage the employment of temporarily recruited workers. In November 1973, recruitment of non-EEC immigrant workers was banned, and in January 1974, it was proposed to encourage those already in Germany to return home by paying them a gratuity (of between £165 and £230 a head).

Switzerland is without doubt the country where the employment of foreigners has had the most obvious repercussions. On the one hand, immigration has quickly taken on a structural character and, on the other, as Maillat notes, immigration policy has been practically the sole

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1 Although this policy was attributed to the oil crisis, it is more probable that this was merely a catalyst which made the change in immigration policy politically feasible for governments which felt that this was the only way to cope with the social and political problems recruitment of foreign labour had led.

2 For more detailed information on the requirements of entry and on the situation of migrant workers in Germany see (a) W.R. Böning, Foreign Workers in West Germany, The New Atlantis, Vol. II, No. 1, pp. 12-38 and (b) Suzanne Paine, Exporting Workers: The Turkish Case, CUP 1974. The above information has been taken from the latter source.

3 For a summary of D. Maillat's work on the Swiss situation see 'The Effects of the Employment of Foreign Workers', OECD, 1974.
instrument at the disposal of the Federal Government for direct intervention in economic activity. Recruitment is left to the employers, but the government does exercise strict control over the admission and residence of foreigners. It has been an official policy to maintain a rapid turnover of foreign workers in order to prevent their gaining residence rights and settling down.

In 1964 the Federal Council ordered firms to reduce their foreign personnel and, in addition, introduced more restrictive measures with regard to entry. These restrictive measures have led, however, to a more settled immigrant population with a higher proportion of non-working dependants—a situation similar to that in Britain since 1962. After undergoing changes of varying importance, the system was radically transformed from 1970 onwards. The main features of the present scheme are:

(i) the aim of stabilizing the number of active foreigners;
(ii) relaxation of the restrictions concerning occupational and geographical mobility of workers on annual permits;
(iii) allocation of newly admitted workers by cantons, and responsibility by the same cantons for the redistribution of labour amongst enterprises.¹

Industrial Distribution of Immigrants

The industrial and geographical distributions of the immigrant workers is of significance in determining the economic effects on the recipient countries. For one thing, the industrial distribution

¹For more detail see Maillat's work in [41].
influences the extent to which immigration facilitates changes in the economy's structure. Secondly, as will be shown in chapter V, the industrial distribution affects the relative prices of various goods and services and, in turn, this has an affect on economic welfare. On the other hand, concentration in certain industries may lead to concentration in certain geographic areas and this may raise social problems of overcrowding in housing, schools, etc.

Industrial Distribution of New Commonwealth Immigrant Workers in the U.K.

K. Jones and A.D. Smith, in their book 'The Economic Impact of Commonwealth Immigration', analyse the industrial (and occupational and geographic) distribution of New Commonwealth immigrant and total labour forces in Great Britain. What follows is a brief summary of their analysis and conclusions.1

By classifying the immigrant labour force into the various industries of United Kingdom standard industrial classification, they examine whether immigrants in general and New Commonwealth immigrants in particular are found in disproportionately large or small numbers in any industries. Their view is that for the period till 1966 "it can hardly be claimed that the industrial distribution of immigrant workers is very different from that of the labour force as a whole"2, and that "in this period, New Commonwealth immigrants had essentially an across-the-board, scale effect on the British labour force, but did relatively little either to modify the existing occupational and industrial pattern or the manner in which it was changing. Despite the large contribution which New Commonwealth workers made to the increase in the British labour force in the period 1961-6, its structural impact, even at the

1 Since we can safely assume that there are no New Commonwealth workers in Northern Ireland, this analysis can be applied to the United Kingdom as well.
2 op.cit. p.76.
An important question is whether such findings depend on the type of industrial classification used. In other words, we need to ask how the various industries should be aggregated for the purpose. As is argued more fully in chapter IV, the various industries should be aggregated so as to make a distinction between traded and non-traded sectors and, moreover, within the former a distinction should be made between the import competing and export industries, and within the latter a distinction should be made according to whether prices are market determined or fixed by institutional factors.

With this in mind I used the data from Jones and Smith\(^1\) to calculate the ratios of the New Commonwealth and indigenous labour forces for these sectors and industries. This is shown in Table II.

Although no industry can be unambiguously defined as 'importer' or 'exporter', agriculture + food have been treated as the import-competing industry and manufacturing as the export industry since the U.K. has traditionally been a net importer (exporter) for the former (latter) sector. As for the non-traded sector, the subdivision is made since the price in the housing industry (a subdivision of construction industry) is determined through the market mechanism while the price for the professional (medical and education) services are normally determined outside the market.

\(^1\)ibid. p.82
\(^2\)ibid. Appendix Table 3.3
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<td>Import-Competing Industry</td>
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<tr>
<td>Agriculture + Food</td>
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<td>1,582,089</td>
<td>546,562</td>
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<td>Manufacturing (excl. food)</td>
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<td>203,719</td>
<td>7,792,556</td>
<td>7,898,868</td>
<td>0.0076</td>
<td>0.0127</td>
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<tr>
<td><strong>NON-TRADED SECTOR:</strong></td>
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<tr>
<td>Market Prices</td>
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<tr>
<td>Construction</td>
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<td>23,950</td>
<td>1,624,530</td>
<td>1,933,203</td>
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<td>1,653,136</td>
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</tr>
<tr>
<td>Fixed Prices</td>
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<td></td>
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<td></td>
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<tr>
<td>Professional Services</td>
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<td>66,533</td>
<td>2,150,321</td>
<td>2,570,168</td>
<td>0.020</td>
<td>0.025</td>
</tr>
</tbody>
</table>

1. This table has been adjusted for the U.K.
It is interesting to note in passing that the industrial distribution of immigrant labour in France, West Germany and Switzerland shows greater concentration than in the U.K. In France over one-third of male foreign workers in 1968 were in the building industry, and altogether two-thirds of male foreign workers were employed in only four industries (building and public works, engineering, agriculture and commerce). Women workers are also highly concentrated: well over half are employed in only three sectors: domestic service, personal service, and commerce. In West Germany the overwhelming majority of immigrants are in manufacturing industries and building: more than one-half of male foreign employees are in metal production and engineering and building, while one half of the women are in textiles and clothing, metal production and engineering, and electrical goods. In Switzerland too we find heavy concentration in certain types of industries: mechanical engineering, metal products, and clothing and textiles.

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1 See Table III: 5 on p.63 in [14]

2 See Table III: 10 on p.71 in [14]
CHAPTER II

THE THEORETICAL FRAMEWORK
INTRODUCTION

In Chapter V below I try to estimate the welfare impact of immigration from the New Commonwealth during 1951-66 on the indigenous population of the United Kingdom. Such an analysis obviously requires a theoretical framework. This chapter surveys some writings of previous writers and suggests how their results can be extended for our purposes.

The traditional theory of international trade teaches us that in a perfect competition setting trade results in gains to all countries taking part, and that trade expands till the relative commodity prices are equalized\(^2\). But the theory has also shown that domestic distortions may reduce the gains from trade and even lead to a loss.\(^3\)

International labour migration is 'trade' in a factor of production: this 'trade' arises, among other reasons, if relative factor prices differ between countries. This suggests that the welfare analysis of migration can be undertaken with the same tools as are used in trade theory. Such analysis has previously been done by authors such as H.G. Johnson (26), P.B. Kenen (62), and R.A. Berry and R. Soligo (43). Now although they were concerned with the welfare implications

\(^1\)Due to the unavailability of the industrial distribution tables of the 1971 Population Census, the calculations relating to 1971 could not be undertaken.


of emigration for the population remaining behind, I show in this chapter how their analysis can be reversed and applied to the effects of immigration on the indigenous population. All the situations considered by these writers illustrate a basic proposition: immigration affects the welfare of the indigenous population only when it affects the relative prices of factors and commodities. In conducting their analysis, these writers have assumed away domestic distortions introduced by government intervention, taxes and tariffs. However, our comparison with the international trade model suggests that distortions may affect their conclusions — this task will be undertaken in chapter IV.

The present chapter will be divided into two broad sections: the short-run analysis of immigration and the long-run analysis of immigration. In the first section the welfare implications of immigration for the indigenous population of (A) a closed-economy and (B) an open economy will be considered, and the importance of the difference between a one-product and a two-product economy will be emphasized alongside the importance of capital ownership on the part of the immigrants. In the second section the long-run implications for a closed economy will be dealt with and the importance of the differences in saving propensities between the immigrant and the indigenous populations will be pointed out.

Previous writers' theoretical analyses of the welfare effects may be classified into short-run and long-run models. There is, however, considerable similarities in the framework employed. The following assumptions underlie the models employed by most of the previous writers:
1. there are two factors of production, capital (K) and homogeneous labour (L);
2. factors are continuously substitutable with diminishing returns to each factor; factor prices are flexible so that factor markets are always cleared;
3. there are constant returns to scale (CRST);
4. utility functions of individuals are independent of each other;
5. marginal utility of income is assumed to be equal for all owners of factors of production;
6. the immigration is a once and for all affair;
7. there are no remittances to the immigrants' mother country; and finally,
8. external effects are assumed away.

What distinguishes the short-run and long-run models is that whereas in the former the supply of all factors is inelastic, in the latter case immigration may affect the level of savings and the capital stock.

SECTION I

The Short-run Analysis

We have a number of cases here depending on whether or not the host country engages in foreign trade and on whether or not migration causes any reallocation of factors. In all cases, however, the main point is
that it is only if and when immigration affects the relative factor prices that the welfare of the indigenous population is affected.

A. Immigration with no foreign trade

(i) The One-Product Economy:

The simplest situation is where the host economy produces only one product: migration involves no reallocation of factors.

Figure 1 shows a case examined by Berry and Soligo (53). The area under the MPPL curve shows the total product available from the given endowment of capital if combined with varying amounts of labour. The initial stock of labour in the host country is OL\textsubscript{1}; this is completely inelastic with respect to the real wage. The total product is OAACL\textsubscript{1} and the MPPL is OE. Now suppose an immigration of L\textsubscript{2} workers, who bring no capital with them. The total product increases to OABL\textsubscript{2}. The distribution of this product is as follows: since the equilibrium wage rate falls to OF and since the immigrants own no capital, their share will be L\textsubscript{1}DBL\textsubscript{2}. The income of the indigenous population of the host country increases by DÇB or the area T; the income of capitalists goes up by Y + T and this more than offsets the loss to indigenous labour shown by Y. The reason why the home country gains is that immigration affects the capital labour endowment ratio in the economy and hence the relative factor prices. This change in the real wage along with the assumption that factor rewards equal the marginal product, means that the intramarginal migrants contribute more to total product than their wage.

An alternative way of illustrating the above conclusions is found in Kenen (62). This analysis, which makes use of a two-factor isoquant
MPPL = the marginal physical productivity of labour line
$L_1 \ L_2$ = the amount of immigration
diagram has the advantage of showing how the effect of immigration on the host population's welfare may depend on the elasticity of factor substitution. In Figure II the initial labour force of the economy is 0 and the capital stock is \( K_0 \). Total output is given by the isoquant \( P_0 \). The wage rental ratio is given by \( \tan \beta \). National income in units of capital is \( V_0 \). Of this \( V_0 \) goes to the capitalists and \( K_0 V_0 \) goes to the workers.

Immigration increases the labour force to \( L_1 \); the relative price of labour falls such that the factor price ratio is now shown by \( \tan \theta \). Full employment is reached when output expands to \( O_P^1 \). The immigrant labour gets \( AB = CD \). The indigenous population as a whole now enjoys an income corresponding to the output level \( O_P^1 \) which is greater than the initial output level \( O_P \). However, there is a distribution of income against the indigenous labour who now get only \( AK_0 \). We can see that the elasticity of factor substitution will determine the extent of the change in relative factor prices, as between points \( E_0 \) and \( E_1 \), and hence influence the effect of immigration on host country welfare.

Now let us see what happens if the immigrants were to bring some capital with them. (For convenience of exposition I return to the diagramatic analysis of Berry and Soligo). The effect on the welfare of the host country is seen to depend on whether or not the 'immigrants' capital/labour ratio is the same as that of the indigenous population (since that determines whether or not immigration affects relative factor prices). Consider first the case where the relative endowment differ. Let the immigrants' capital/labour ratio be relatively lower. The inflow of labour equals \( L_1 L_2 \) units. The inflow of capital will cause the MPPL curve to pivot to the right to, say, \( MPPL_1 \) as shown in \( L_1 L_2 \).
Figure II

The one-product closed economy

$T_0T_1$ = the initial factor-price line
$E_0$ = the initial equilibrium point
$L_1L_2$ = the amount of immigration
$BT_2$ = the post-immigration factor-price line
$E_1$ = the post-immigration equilibrium point
III. Now if, as assumed, the production function is linear homogeneous the total product will increase but less than in proportion to the increase in the labour force. So, once again, the wage level will be reduced. The post-immigration total product will be \( OABL_2 \) such that \( OABL_2/OACL_1 < OL_2/OL_1 \). The amount \( D+L_2L_1 \) will be the return to immigrant labour and \( A+L_2L_1 \) to immigrant capital. The indigenous population will gain the amount \( D+L_2L_1 \) : this constitutes a gain to capitalists (\( \equiv EFD_1^C \)) which more than offsets the loss to labour (\( \equiv EFD_2^C \)).

However, if the capital/labour ratio of the immigrants were the same as that of the indigenous population, the welfare of the latter would not be affected. In this case the MPPL curve would pivot to the right to, say, MPPL' as shown in Figure IV and under constant returns to scale, the location of MPPL' would be such that the total product would increase in proportion to the increase in the labour force, i.e. \( OAC'L_2/OACL_1 = OL_2/OL_1 \). The wage level would not be affected and therefore the welfare of the indigenous population would remain the same. The amount \( ACC' \) would be the return to immigrant capital and \( CC'L_2L_1 \) to immigrant labour.

ii) The Two-Product Economy

By introducing more than one product in the economy we allow for the possibility that immigration may lead to a reallocation of factors. However, as seen below, this does not affect the basic nature of the conclusion reached in the previous section.

\[ ^1 \text{For an alternative exposition see H.G. Johnson (26).} \]

\[ ^2 \text{In terms of Figure II this possibility can be shown by shifting the factor price line outwards parallel to the initial line, } TOT_1. \text{ Now, the new production point will be at the point where the new factor-price line intersects the ray denoted by } ORo. \]

\[ ^3 \text{The analysis is due to P. Kenen, op. cit.} \]
\[ MPPL = \text{the pre-immigration marginal physical productivity of labour line} \]
\[ L_1, L_2 = \text{the amount of immigration} \]
\[ MPPL_1 = \text{the post-immigration marginal physical productivity of labour line} \]
MPPL = the pre-immigration marginal physical productivity of labour line

L₁ L₂ = the amount of immigration

MPPL' = the post-immigration marginal physical productivity of labour line
Suppose that the host country produces two commodities, A and B; the former is relatively capital intensive at all sets of factor prices. And assume also that all individuals have the same tastes, with unitary income elasticities of demand for each commodity.

Consider first the case of immigration of labour without any capital. The initial transformation curve is T₀T₀ in Figure V. The equilibrium point is E₀: the country produces and consumes Oₐ₀ of B and Oₐₒ of A. National income measured in units of A is OY₀. After immigration, the transformation curve will shift outwards to, say, T₁T₁ such that at constant product prices, the economy will produce more of B and less of A; this result arises from the Rybczynski theorem¹ which says that an increase in the endowment of labour brings about a rise (fall) in the production of the labour intensive (capital intensive) product. At constant prices national income would increase to OY₁. However, owing to the unitary income elasticities of demand, consumption at constant prices would be Oₐ₂ of A and Oₐ₂ of B – i.e. there would be an excess demand for A (= A₁A₂) and an excess supply of B (= B₁B₂). The price of A must rise relative to that of B; equilibrium is restored when the price ratio is as shown by the line P₂ in the diagram. At this relative price the indigenous population enjoys the welfare level U₂ which is higher than in the initial situation. Note that since the relative price of the capital intensive product has increased, this overall gain is the net effect of gains for domestic capital and loss to domestic labour.

Next consider the case where immigrants bring some capital with them such that their capital/labour ratio is the same as that of the indigenous population. The transformation curve shifts to, say, T₂T₂:

Figure V

The two-product closed economy

$T_0T_0$ = the pre-immigration transformation curve
$E_0$ = the pre-immigration equilibrium point
$T_1T_1$ = the post-immigration transformation curve
$U_2$ = the post-immigration welfare level enjoyed by the indigenous population
in keeping with the Rybczynski theorem T2T2 will be merely a blown-out version of T1T1. If the two groups have identical tastes, the consumption and the production will now be at P1 and relative prices of products and factors will not change. The indigenous population will remain on the original utility level denoted by U0; and the distribution of income between indigenous labour and capital will not be affected either.

Thus, we find that allowing for a second product does not affect the conclusions reached earlier: immigration will increase welfare of the indigenous population whenever it affects relative prices of factors and for this to happen (in a closed economy model) the capital/labour ratio of the immigrants should differ from that of the indigenous population.

B. Immigration with foreign trade:

Introducing foreign trade into the analysis leads, as P.B. Kenen (62) has shown, to a distinction between:

(i) an economy that is too small to affect its terms of trade, and
(ii) an economy that is large enough to affect its terms of trade.

The distinction is relevant since in the former case immigration can have no effect on relative commodity prices and on relative factor prices and hence will not affect the welfare of the indigenous population: any excess demand or supply caused by immigration can be satisfied by changes in imports and exports. The small country case need not therefore be dealt with any further.
Immigration to a 'large country'

The effect of labour immigration on the welfare of the indigenous population will depend on how it affects the host country's terms of trade. Within the context of the Heckscher-Ohlin model the terms of trade change will depend on (i) whether the host country initially exported or imported the labour intensive product as well as on (ii) the capital/labour ratios of the immigrants.

In Figure VI the country initially exports product B which is relatively labour intensive. Production equilibrium is at E₀ on the transformation curve T₀T₀ while consumption is at C₀ on the budget line Y₀Z₀: the trade triangle is A₀C₀E₀. Now allow immigration of labour with no capital. Following the Rybczinski theorem, we see that at the initial prices there will be an excess supply of B and an excess demand for A. The terms of trade of the host country will deteriorate. The indigenous population will therefore suffer a welfare loss: its equilibrium is now on the indifference curve U₁.

In Figure VII the host country initially imports the labour-intensive product: A₀C₀ of B are obtained in exchange for A₀E₀ of A. Following immigration (with no capital) the constant-price consumption point will be C₁ and the production point E₁. This will cause an excess supply of B and therefore the terms of trade move in favour of the country: relative prices are now shown by \( Y_{2}Z_{2} \). The indigenous population will enjoy a gain in welfare: their equilibrium will be on the indifference curve U₁.

Note that the analysis assumes a policy of free trade on the part of the large country. This situation is not optimal and because of this immigration may worsen the country's welfare. This point has already been recognized by Dutta (13).
Figure VI

The two-product open economy

$AC_0E_0$ = the pre-immigration trade triangle

$U_0$ = pre-immigration welfare enjoyed by the indigenous population

$BC_1E_1$ = the post-immigration trade triangle

$U_1$ = post-immigration welfare enjoyed by the indigenous population
The two-product open economy

$AE_0C_0 =$ the pre-immigration trade triangle

$U_0 =$ pre-immigration welfare level enjoyed by the indigenous population

$BC_1E_1 =$ the post-immigration trade triangle

$U_1 =$ post-immigration welfare level enjoyed by the indigenous population
Summary and conclusion for the short-run analysis

The general conclusion that emerges from the analysis so far is that immigration will affect the welfare of the indigenous population only if it affects the relative prices of products and factors. In a closed economy model this result depends on whether or not the immigrants' capital/labour ratio differs from that of the indigenous population. When trade is allowed into the model, the welfare change depends on whether or not the terms of trade of the host country is affected and, if it is affected, in what direction (which is shown to depend on the initial trade pattern of the host country).

Why Migrate?

Before we turn to consider the long-run implications of immigration let us digress for a moment. In the analysis so far, we have considered only the effects of immigration on the indigenous population. However, the incentive for immigration has not been examined: in other words, immigration has been taken as granted. One would expect the economic reason behind migration to be higher earnings in foreign countries, and that (in the absence of any restrictions) migration would continue until relative factor returns were equalized throughout the world. Peter Kenen has shown how this can be incorporated within a modified Heckscher-Ohlin model.

In addition to the assumptions already made we now also assume that the production functions of one country display a product-neutral factor-neutral superiority in economic efficiency. This will mean that

1See op. cit.
although under free trade relative factor prices will be equalized between countries, the absolute marginal products will be higher in the one country. Thus, the inter-country differences in technology create the incentive for migration.

Under these conditions migration will increase the incomes of migrants and increase 'world' demand for both commodities. Now if only labour had migrated world output of the labour intensive products would increase (at constant prices) while output of the other product would be reduced. The relative price of the former will decrease redistributing income in favour of capital within each country. So, if the host country exports the capital (labour) intensive product, immigration will increase (decrease) the welfare of its indigenous population.

SECTION II

The effects of Labour Immigration on the Indigenous Population in the Long-Run

The preceding analysis may be thought of as a short-run analysis in the sense that capital was assumed to be a stock of factor that was not affected by immigration. Berry and Soligo (53) have offered a long-run analysis where migration affects the amount of saving and investment. They present their argument with reference to the effect of emigration on the population left behind. In this section I translate their analysis to the effect of immigration on the welfare of the indigenous population.

The Berry and Soligo model envisages a closed-economy stationary equilibrium where, in the absence of migration, the labour force and the welfare.

1This result, if sufficiently extreme, could disappoint the expectations of the migrants themselves and reduce their welfare.
capital stock would be constant over time. Their society is one where there is no bequeathing so that an individual saves only in order to redistribute the pattern of consumption over his own life. As in the short-run analysis, the effect of immigration on the welfare of the indigenous population will depend on whether or not relative factor prices are affected; and by analogy with the short-run case, where the change in factor prices required that the capital/labour ratio of the two groups be different, what is necessary in the long-run case is that the propensities to save or hold wealth differ between the two groups.

In Figure VIII the curve MPPK shows the marginal physical product of capital. The curve ST shows the "willingness to hold yield-bearing wealth"; both of these curves refer to the indigenous population. Each point on the ST curve is a potential long-run equilibrium in that it implies no net saving.

In the initial situation the capital stock is $O_k^1$ and return per unit of assets held is $OC_r$. The area under the MPPK curve gives the total output. Note that although $OCE_k^1$ represents the total return to capital, the net return is only $CRS$, the rest being the costs necessary to persuade part of the indigenous population to change the time pattern of consumption in order to save. The total return to labour is $ACR$.

Now consider the effect of immigration. As a first possibility assume that the willingness or propensity to hold yield-bearing assets

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1 See Berry and Soligo, op. cit. p.786.

2 The diagram implies that the rate of return on capital will equal the interest rate - i.e. any real world differentials between these two (due to, say, risk aversion, incomplete information) are assumed away.
Figure VIII

$\text{MPPK} = \text{the pre-immigration marginal physical productivity of capital curve}$

$\text{VW} = \text{the propensity to hold yield-bearing wealth curve of immigrants}$

$\text{ST} = \text{the propensity to hold yield-bearing wealth curve of the indigenous population}$

$\text{MPPK'} = \text{the post-immigration marginal physical productivity of capital curve}$

$\text{OC} = \text{the pre-immigration returns to asset holding}$

$\text{OC'} = \text{the post-immigration returns to asset holding}$
differs as between the two groups. Specifically assume that the propensity is lower for the immigrant population; this is illustrated in Figure VIII where their asset holding curve VW lies everywhere above the corresponding curve of the indigenous population. The total willingness to hold yield-bearing wealth is now shown by SNZ. The increase in the labour endowment will cause the MPPK curve to rotate outwards to MPPK'. (The exact location of MPPK' will depend on the nature of the production function. Under constant returns to scale, the location of MPPK' will be such that the ratio of the areas AMC'/AMM' will equal the ratio of the immigrant to indigenous populations). The equilibrium capital stock increases to OK₂ and the total product becomes OAMK K₂. Note that although the distance of MPPK' curve from the vertical axis is twice that of the MPPK curve, the increase in the equilibrium capital stock (and hence in the total product of the economy) is less than two-fold because the total willingness to hold yield-bearing wealth curve, SNZ, slopes upwards — i.e. the opportunity cost of saving and investing becomes higher as we move to the right along the SNZ curve. Note also that with a return to asset holding of OC' immigrants do not save at all. The income of the indigenous population increases to OAMM'K₂; labour receives AC'M of this while capitalists receive a net income of SC'M'. Immigrants receive AMM' as returns to labour; they earn no income as capitalists since at the new equilibrium rate of return on capital they do not hold any assets.

It should be clear from this that the source of the gain for the indigenous population is the possibility of a change in the rate of return on capital relative to that to labour. In order to emphasise the point consider in Figure VIII a case where the immigrants' willingness to hold yield-bearing assets curve coincides with that of
the indigenous population. The aggregate curve is $ST'$ which intersects at $MPPK'$ and $R'$. The rate of return remains unchanged and so does the income of the indigenous population.

Conclusions

The conclusions that emerge from the preceding survey is that if the host country is initially in a Pareto-optimal situation, immigration will unambiguously increase the welfare of the indigenous population whenever it affects the relative prices of factors. If the country has no foreign trade, the change in relative factor prices requires, in the short run, that the capital-labour ratio of the immigrants differs from that of the indigenous population. In the long run saving propensity of the two groups takes the place of the capital-labour ratio.

The open economy analysis has been undertaken on the assumption that the host country follows free trade. Here a distinction has to be made between the 'small' and 'large' country. In the former case free trade is the optimal policy. Immigration cannot affect the terms of trade of the host country and therefore cannot affect its welfare. For the large country case, free trade is not the optimal policy. Immigration increases (decreases) welfare of the indigenous population according to how it improves (worsens) the country's terms of trade. Moreover, as the change in the terms of trade may affect the relative prices of factors, there will be a change in the distribution of income as between the indigenous capital and labour.

In Chapter IV, I build upon the preceding analysis. I focus particularly

1The analysis had assumed identical and homothetic tastes in the indigenous and immigrant populations. If tastes were not identical (or not homothetic) immigration may affect relative factor prices even when the two populations have identical capital-labour ratios.
on the fact that immigration occurs in situations that are not otherwise Pareto-optimal. For instance, immigrants may contribute to production of and demand for certain non-traded services where prices are fixed by the government rather than determined by competitive forces. Or it may be that immigrants are employed in traded-goods industries that have tariffs and/or taxes. Introduction of such distortions leads to considerable revision of the results reviewed above.
CHAPTER III

SURVEY OF EMPIRICAL RESEARCH
INTRODUCTION

This chapter surveys the empirical literature on the impact of immigration with particular reference to the United Kingdom and West European experience. There is a noticeable difference in approach between that of the empirical researchers and the theoretical models considered in the previous chapter. The theoretical analysis was concerned with the impact of immigration on the economic welfare of the indigenous population of the host country: the models employed there had, like models for analysing the welfare effects of changes in tariffs, assumed that the government of the host country could regulate aggregate demand and allow changes in the foreign exchange rate (or in the commodity terms of trade) so as to avoid inflation and unemployment, and to keep balance of payments always in equilibrium. In contrast, the empirical researchers have assumed constraints on government policy and been concerned with the effects on aggregate demand and on the balance of payments: the welfare implications have been almost completely neglected. Section I examines the impact of immigration on aggregate demand while Section II deals with the implications for the balance of payments. In concluding the chapter, I discuss whether the empirical information surveyed is of relevance for welfare considerations.

SECTION I

IMMIGRATION AND AGGREGATE DEMAND

Economists' views on the effects of immigration on aggregate demand essentially fall into three categories:
(i) the net impact is inflationary in the short run but may be deflationary in the long run;

(ii) the effect is deflationary in the short run but inflationary in the long run;

(iii) the effect is deflationary regardless of the time period concerned.

Let us now consider these three views in turn:

Inflationary in the short run

According to the proponents of the first view, although immigrants increase total output, this is more than offset by the increase in expenditure (particularly on the capital goods) that is required to employ the immigrants. The leading advocates of this view are Mishan and Needleman (36) and Rostow (46). The former model relates to the United Kingdom experience and is therefore worth considering in detail.

The starting point of the Mishan and Needleman argument is that during the sixties Britain was experiencing an excess demand for goods which was reflected in an excess demand for labour. They set up a model for estimating the effects of immigration on aggregate net output, aggregate net expenditure, and on the balance of payments under the constraint that the rate of exchange and the internal relative prices are held constant. The basic equation of their model is: \( E_t = D_t - Z_t \)

where \( E_t \) is the excess aggregate demand for net domestic product generated by immigration, \( D_t \) is the value of aggregate net expenditures on domestic goods and services, and \( Z_t \) is the aggregate net value added to domestic product. All values are measured in terms of real factor
cost. The expenditures consist of the aggregate consumption expenditure, aggregate government expenditure, and aggregate investment expenditure on industrial and social capital. On the supply side is the aggregate income of immigrants. The required investment in industrial capital is estimated from a relationship between the capital stock and income, and the primary increase in national income resulting from the immigrant inflow. The investment in social capital is estimated by assuming that the requirement per immigrant family grows at the average growth rate for the population as a whole.

The quantitative impact of immigration on excess demand depends on what they call the marginal investment response coefficients. These are $\lambda'$ and $\lambda''$, respectively for industrial and social capital. These coefficients relate the idle capacity in the economy to the additional investment required to accommodate the immigrants, e.g. $\lambda'$ approximates unity in cases where immigrants are provided with a new stock of industrial capital equal to the average while $\lambda''$ approaches unity if immigrants tend to settle in cities where there is least likely to be any spare social capital and housetroom. If both $\lambda'$ and $\lambda''$ are unity, we can expect the net inflow of immigrants to import an inflationary effect on the host country, if both are zero we expect a deflationary effect. More precisely we can determine some crucial values of the $\lambda$'s below which primary excess aggregate demand is negative and above which it is positive.

The model was used to estimate the effect of immigration from Jamaica. They assumed for $\lambda'$ a value roughly equal to unity and for $\lambda''$ a value of not much less than unity. It was also assumed (without explanation) that immigrants' additional capital requirements would be
met within two years of arrival. A uniform inflow of immigrants in the absence of emigration (or alternatively, an immigration on so large a scale that emigration may be disregarded) was also assumed. (The calculations applied to a short period over which the behaviour parameters remained unchanged). Their calculations show that for \( \lambda \) values below 0.1 immigration generates excess aggregate supply, and that the higher the growth rate the greater this excess supply\(^1\). For \( \lambda \) values in the range between 0.2 and 1.0 we have excess demand. And for given values of \( \lambda \) the higher the economy's growth rate, the greater the magnitude and duration of the primary excess aggregate demand.

Rustow (46) arrives at fairly similar conclusions in an analysis of immigration into West Germany\(^2\). He estimates the expenditure on social and industrial capital that has to be made for each new immigrant worker and how long it takes the worker to produce a surplus equal to that initial investment. This procedure assumes that foreign workers cannot be employed by more intensive use of existing capacity. He comes to the conclusion that "it takes six years for a foreign worker to produce a surplus equal to the initial capital outlay which he requires. During this period, the effects of his presence is to create excess demand; only later does he create excess supply"\(^3\).

**Inflationary in the Long Run**

In contrast to the above findings, some Swiss economists\(^4\) have suggested that immigration of labour has a stabilizing effect in the

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\(^1\) They say, however, that only in the event of widespread unemployment are the \( \lambda \)'s likely to be so low, and that in that event immigration will act to intensify the slump.

\(^2\) See (14) p.387.

\(^3\) Quoted in ibid. For a fuller discussion of Rustow's model and his assumptions see ibid. pp. 387-8 and (45) p.14.

\(^4\) This section is based on (45) p.15, (14) pp388-9, and (41) pp.30-1
short run but leads to inflation in the long run. Their argument is basically as follows: the initial effect of immigration is to hold down wages and maintain profit levels. Since immigrant workers send their savings home and consume relatively little, they contribute far more to supply than to demand. It is not very clear what the likely effects on investment may be. On the one hand these writers assume that little investment is required to employ at least the first wave of immigrant workers and that hardly any new housing, hospitals, or school facilities are provided. On the other hand it may be argued that if immigration maintains profit levels it will induce an increase in investment.

The turning point to inflation comes later. The low wage levels having increased profitability (particularly or labour-intensive production) will encourage investment. At the same time the still relatively low price level leads to high demand for exports (at the prevailing exchange rate). To satisfy this excess demand additional foreign labour is admitted. This second round of immigration reinforces the whole process. In Bohnings' terminology, the migration process becomes self-feeding. At a later stage, as the immigrant workers bring in their families, investment in new housing and infra-structure can no longer be postponed. An upward spiral takes place, which results in 'over heating' of the economy and inflation. The main adherents to these views are A. Gnehm (22), E Tuchfeldt (58), Lutz (32), and Maillat (11) who were writing about the Swiss experience, and Fohl (20) and G.E. Völker (60) who were writing about the W. German experience.

Immigration is Deflationary

Not all the commentators consider immigration to have an inflationary effect. C.P. Kindelberger (30) has argued that the effect of immigration into the Western European countries has been deflationary. According to his theory, which is basically based upon the Lewis model of growth with unlimited supplies of labour, the availability of immigrant labour supplies, though not being the initial cause of economic expansion in Western Europe, has been the main factor in sustaining growth. The mechanism for this effect has been through the holding back of wage increases. Profits were able to increase thus encouraging new investment. Furthermore, since the immigrants had high rates of savings (which they
remitted abroad) they contributed more to supply than to demand. As long as the supply of labour remains unlimited, growth continues in a self-generating process. It is only when labour supplies become less readily available that growth rates are likely to slow down.

Using the framework of the Lewis model, Kindleberger treats the Western European countries as the industrial sector and the countries of emigration as the agricultural sector: in Germany and Switzerland particularly, immigrant labour sustained "the virtuous circle of exports leading to higher incomes, profits, and investment, which in turn lower prices and stimulate exports once again". However, he considers that Britain with its low net immigration does not fit his model. Although the argument is intuitively appealing it leaves some questions unanswered: for instance, he does not explain how immigration may affect demand conditions and entrepreneurs' incentives for expanding markets.

In order that immigration forestalls any inflationary effect, the immigrants should add more to production than to consumption. This is more likely the higher is their propensity to save. Bohning considers that this has been the case for most West European countries. He relates immigrants' high saving propensity to their family composition — i.e. their low dependency ratio — and also points to the role played by remittances as a source of deflationary impact. He admits, however, that the net deflationary effect of the latter is more limited than might be imagined given the possibility that these remittances may turn back on the market of the immigration country in the form of consumer demand.

1 See (30) p. 3.

2 See (41) p. 31.
G.C. Schmid (50), Bain and Pauga (2), and Mehrlander (33), who were writing about West Germany provide a considerable amount of evidence on the dis-inflationary impact of immigration. Schmid suggests that "the evidence is strong that in Germany hoarding of the marginal worker during slack production periods has been low (or rather that turnover at the margin has been high) while expansion of employment when demand first picks up has been rapid. This has meant either larger profits for the German firm and, thus, relatively higher levels of savings and investment, or lower prices for German goods vis-a-vis foreign goods". Bain and Pauga tested the relationship between money wages, prices, employment of foreign workers and unemployment using data for eighteen industries over the period 1961-69. They found a good fit for a linear model where the money wages in each industry lagged (one or two years) behind the number of foreign workers employed in that industry and the number of workers unemployed in the industry; an increase in the level of prices was seen to cause intra-industry money wages to rise, while an increase in the employment of foreign workers and the number of unemployed workers in an industry retarded money wages. Garbers and Blankart (21) found that Switzerland had had rather a similar experience: increased immigration control was accompanied by much sharper price increases. Maillat (41) shares the same opinion. Ursula Mehrlander (33) found that foreign workers in W. Germany produced more than they consumed and that this may have damped price increases.

1 See (50), p.252
2 Cited in (43) p.13
3 Cited in Völker, p.72. Mehrlander calculated foreign workers' MPS at .45 in 1967. Her results may be correct for a closed economy. For an open economy, however, the conclusion has to be modified, keeping in mind that remittances sent home are quite often immediately used by the home country to satisfy import needs.
Evaluation of the Findings

Before we go to the next section let us consider the criticisms levelled at the findings of the above writers. The emphasis here will be on the Mishan and Needleman model because of the controversy it has aroused and because it is concerned with the United Kingdom experience.

Major criticisms of the Mishan-Needleman analysis have been made by K. Jones and A.D. Smith (28). First, they say that it is not a realistic guide to the implications of immigration flows into Britain: whereas Mishan and Needleman were concerned with the "effects of a large-scale immigration into any country that might occur under an open door policy", Jones and Smith consider that the British experience during 1961-66 had been quite the opposite in that emigration from Britain was running at a rate equivalent to about half that of total immigration\(^1\). More specifically, Jones and Smith point out that "the values assumed for some of the basic parameters - the marginal investment responses especially - are strongly influenced by this assumption of mass immigration and so, therefore, are the final results".\(^2\)

They suggest that to some extent the immigration may simply have served to "fill in" a gap caused by a dip in the growth of the indigenous population and by emigration; in other words some immigrant workers may have been employed with spare industrial capacity. The (plausible) assumption underlying this criticism is that the pattern of immigrant demand does not differ markedly from that of the indigenous population, the latter influencing the industrial composition of the excess industrial capacity. The growth of shift-work in the early sixties would also have made it possible to meet the additional demand from the existing stock of industrial capital. They also consider that the demand on social capital due to immigration may have been small owing

\(^{1}\) op. cit. p.143

\(^{2}\) ibid. p.143-4. What follows is based on ibid.: chapter 9.
to the possibility that there was much elasticity in the absorptive
capacity of the existing stock of social capital. This was especially
so in the case of housing.

The point about housing has also been made by David Collard
(15) who thinks it astonishing to assume (a) that each immigrant
family would be provided with a stock of social and industrial capital
equal to the average (i.e. $x_1 = 1$, $x^* = 1$) and (b) that this capital
would be provided over a period of two years. "Clearly it would be
more sensible to assume a lower value of the $x_1$s and also a longer
period for building up the new level of capital".

Considering together the needs of industrial and social capital
Jones and Smith write "in terms of the additional capital formation
required, the needs of new immigrants are really quite small, probably
not more than about $2\%$ per cent of total capital formation in the
period 1961-66, despite the fact that New Commonwealth immigration was
responsible for almost a third of the increase, during this period, in
the British population". Even if the existence of spare capacity
were disregarded, they consider that increase in demand and consequent
inflationary pressure would have been small.

They also discuss the impact of immigration on the rate of increase
of wages. Although the statistical evidence they provide suggests that,
for the most part, occupations where the numbers of New Commonwealth
workers were disproportionately large (in 1961) tended to enjoy above-
average pay increases, they argue that "it might reasonably be expected
that remuneration would have risen even more in the absence of this new
supply of labour". It is also likely that the immigrants joined these

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1 See (15), p. 74
2 op. cit. p. 160.
3 See ibid., p. 154
industries precisely because wages there were rising more than elsewhere.

W.R. Bohning's criticism of the Mishan and Needleman model (and of similar models) is that they differentiate between:

(a) an indigenous population which postpones its consumption in order to provide capital for indigenous unemployed and thereby reap a higher level of future consumption, and

(b) an indigenous population which postpones consumption in order to provide work places for immigrants. Since the immigrants may provide future consumption goods, the foregone consumption in the latter case is like investment in machinery. The Mishan-Needleman distinction has economic justification - it does not matter whether investment is made on indigenous unemployed or in workplaces for immigrants.¹

Conclusions

The survey of recent research suggests that it is difficult to be certain whether immigration imparts an inflationary or a deflationary pressure: experiences of different countries point in different directions. What seems to be more certain, however, is that the magnitude of immigration plays quite an important role. Thus, in Switzerland (the country with the highest proportion of immigrants in its labour force) immigration had disinflationary effects in the short run but that later on its impact was inflationary. On the other hand,

¹See (11), p.178
in countries where the immigrant labour force makes up less than 5% of the total labour force, as in the case of the United Kingdom, it appears that extra demand for goods and capital will not be of such magnitude as to cause an inflationary pressure and the disinflationary effect on wages may also not be significant.

SECTION II
IMMIGRATION AND THE BALANCE OF PAYMENTS

The effect of immigration on the balance of payments may be classified into (a) the direct effects which essentially consist of the direct quantitative impact on imports, exports, and the outflow of remittances, and (b) the indirect impact through the effects on costs and prices. The direct impact on imports will depend on immigrants' incomes and import propensity. As for direct impact on exports, although export demand may be exogenous, immigration may have a direct effect if export orders can be met more easily - i.e. by helping to eliminate supply bottlenecks.

Mishan and Needleman have estimated the effects of immigration into the United Kingdom on the balance of payments. Their model allows for the effect of immigration on the claims by foreigners on the currency of the host country, Mt, and the volume of exports, Xt, required to pay for Mt. However, since exports have an import content, Xt will always be greater than Mt: $X_t = \left[\frac{1}{1-d}\right]M_t$ where $d$ stands for the import content of exports. Their calculations reveal that the time paths of Mt is very

\footnote{Mt is the sum of net remittances and the imports induced by immigrant generated primary expenditures on consumption, on government goods and services, and on investment.}
sensitive to the values of $a$ and $a'$, but that, irrespective of the
values of the $a$'s and the growth rates, the Mt is positive and
increasing from year to year, and that this increase is of sufficient
magnitude to more than offset the indirect price effect on the balance
of payments that may result from any excess supply created by immigrants.
In order to restore this net imbalance, the export prices of the host
country must fall relative to foreign prices. Consequently the real
domestic resources needed to maintain international balance will then exceed those made available by the immigration. The authors consider
only the effects of the initial expenditures of the immigrants and
ignore any multiplier effects. They consider that the adverse effects
of the multiplier repercussions may well be much more powerful than the
primary effects estimated.

Unfortunately their model does not contain any estimate of
immigrant-induced exports: they justify this omission on the grounds
that "no economic model, Keynesian, Marshallian, Input-Output, or any
other assumes any direct relationship between national income, or
domestic labour supply, and aggregate exports". We can argue, however,
that immigrant workers may directly improve exports: in the short run
they may help eliminate supply bottlenecks and in the long run, as pointed
out by Kindleberger (30), immigrant labour may keep production costs
and prices from rising and keep the country's products competitive in

Note here that the fact that the magnitude of Mt is sensitively related
to the values of $a$ implies that in the model the immigrant-generated
inflationary pressure and the adverse balance of payments effect are
closely related. For more details on this see (38), pp.41-2.

See (35), p.103.
The only evidence, to my knowledge, on the increased demand for imports generated by immigrants which is comparable with the Mishan-Needleman results is provided by Jones and Smith who calculated the additional imports caused by the New Commonwealth immigrants to Britain between 1961 and 1966, on the assumption that imports form about the same proportion of immigrants' consumption and capital requirements as they do of the consumption and capital requirements of the total population. Their results "suggests additional imports of £214 million" which is only slightly less than the British current balance of payments deficit for the same period - £217 million - and therefore needs to be taken seriously.

Remittances by immigrant workers have an obvious adverse effect

1 Mishan and Needleman would agree with this to some extent "Should any proportion (of immigrants' output) be exported, the larger this is the less adverse the immigrants' effect on the balance of payments. But, at the same time, the longer will it take for their domestic supply to offset the domestic demand they generate" (See (38), pp. 43-4). There seems to be a contradiction; however, between the two sentences in this passage, in that if the immigrants' output is exported and helps the balance of payments, it will aggravate the excess demand at home. One may complain that immigration does not contribute to the balance of payments or that it increases excess demand, but we cannot simultaneously complain about both.

2 See (14), p. 395.

3 We should also mention here the study by Amita Dutta (19), which is a comparative static model designed to bring out the economic impact of immigration into Ceylon between 1920-38. Dutta's computations show that each immigrant contributed to the value of exports (valued at 1928 prices) Rs. 323 to Rs. 357 - where an estimated level of wages of Rs. 300 was used. It was also found that the effect on the terms of trade was adverse and very heavy (which she attributes to low price elasticities of supply and demand of Ceylon's exports). p. 82.

4 See Jones and Smith, op.cit. p. 156.
on the balance of payments, though to some extent this is mitigated by their favourable disinflationary effect and by the possibility that a certain proportion of the money transferred abroad may return to the immigration country in the form of increased export demand. According to Jones and Smith, during 1961-66 New Commonwealth immigrants in Britain are estimated to have transferred about 7 per cent of their income home: this would be about £40 million.¹

In other Western European countries the propensity to save and the propensity to remit out of savings have been much higher². However, although the sums involved are large, they are hardly sufficient to have a decisive effect on the balance of payments of the immigration countries. As Bohning notes, whether or not the loss of foreign currency is desirable depends on the given situation. "When the trade balance leaves the current account in sizable surplus even after a reduction by invisibles, countries are usually happy to see their balance of payments brought nearer to equilibrium by remittances"³.

Welfare Considerations

The empirical evidence surveyed suggests that particularly in so far as the United Kingdom experience is concerned, immigration may have had

¹ ibid. p.157

² Bohning (41) reports, for instance, that "in Switzerland the savings ratio stood at 60% in 1950 and 50% in 1955. Since that time it has decreased to 30%. External transfers amounted to 35% of the total income of foreigners in 1950, to 25% in 1966 and to 18% in 1970. In Germany in 1970 external transfers in the region of 25% indicated at least double the savings ratio of the indigenous population, 12.5%" (41) p.91.

³ ibid. p.92
an adverse effect on the balance of payments. The question now is whether this is something to worry about. If the foreign exchange rate were free to fluctuate, the imbalance could be restored. What would be the implications of this for the welfare of the indigenous population? A convenient way to answer this is to put the question in the context of a 'real' model where the adjustment is through a deterioration in the commodity terms of trade. We know that if there are no distortions, a deterioration of the terms of trade means a loss of welfare. However, as will be shown in Chapter IV, in situations characterised by distortions in foreign trade or by a purchase tax or tariff, it may be that although immigration worsens the terms of trade, the indigenous population may get a welfare gain. The empirical relevance of this possibility for the United Kingdom experience will then be examined in Chapter V.

1Because if a country can affect its terms of trade, the marginal costs of imports under free trade will exceed the domestic price.
CHAPTER IV

EXTENSION TO THE THEORETICAL ANALYSIS
INTRODUCTION
At the beginning of the previous chapter I pointed to the differing approaches of previous theoretical researchers on the one hand and empirical researchers on the other: whereas the former have been concerned with the effect of immigration on welfare and had used a model where relative prices and the foreign exchange rate are flexible, most of the latter have assumed constraints on government policies such as to rule out the possibility of relative price changes and have examined the effects on excess demand and the balance of payments. This chapter builds upon the work of the previous theoretical contributors and develops a framework that will enable the empirical estimation of the welfare impacts. My approach involves a modification of previous analyses in three ways. Firstly, whereas the earlier writers often focused on the effects of immigration on relative factor prices, I will examine the impact on relative commodity prices: the reason is that the latter procedure is more useful for empirical estimation. Secondly, the distinction made by earlier writers between the closed economy and open economy models is adapted to a distinction between the non-traded and traded sectors. Thirdly, for each of these sectors I introduce certain modifications to make the analysis more relevant for the United Kingdom experience: these include tariffs, taxes and the provision of welfare services.

SECTION I

NON-TRADED GOODS AND SERVICES

For purposes of the welfare analysis, the non-traded sector needs to be divided into two groups: one group such as public transport and
housing where the services and goods are transacted at market prices and the other group, such as education and health where the consumers do not directly pay for the service and where there is no market price for it.

A. Non-Traded Sector with Market-Determined Prices

In order to simplify the analysis, let us assume that the prices of all such goods and services are determined on a perfectly competitive basis. In Figure IX Qh and Sh curves represent the pre-immigration demand and supply. The equilibrium price is OPo.

Now, allow immigration into the model and assume for the moment that immigrants contribute only to the demand. The market demand curve shifts to Qh+m, and the price rises to OP2. This generates an increase in the producer's surplus (= PoE0E2P2) and a decrease in the consumer's surplus (= PoE0CP2); therefore the indigenous population gets a gain in welfare (= EoE2C).

Suppose next that immigrants contribute only to the supply. In this case the supply curve shifts to Sh+m and so the price falls to OP3. This causes a loss in producer's surplus (= PoEoDP3) but an increase in the consumer's surplus (=PoEoE2P3). The net effect is an increase in welfare (= EoE2D).

1We shall refer to this as market-determined prices even though there may be government intervention by way of taxes or subsidies.

2They pay through taxes and rate payments to local authorities etc.
Welfare effects of immigration: Transport and New Housing Sector

Immigration changes the price from $P_0$ to $P_1$
Change in consumer's surplus = $P_0E_0$A$P_1$
Change in producer's surplus = $P_0E_0$BP_1
Net welfare gain accruing to the indigenous population = $AE_0B$
The more probable case is where immigrants contribute both to demand and supply. The important point now is that as long as the price level changes, the indigenous population will obtain a welfare gain. For illustration, let the price go up to \( OP_1 \): the welfare gain will be \( ABE_0 \).

It is shown in Appendix I that the welfare triangle \( ABE_0 \) is equal to:

\[
\frac{1}{2} (\lambda - \alpha) \left[ \frac{1 - \text{Po/Pl}}{\text{Po/Pl}} \right]^2
\]

where \( \lambda \) = the price elasticity of supply and \( \alpha \) = the price elasticity of demand.

B. Non-Traded Sector with no Market Price for the Service

This case includes the educational and health services. The amount of the service provided is determined by governments and consumers' demand determines the shadow price for the service.

In Figure X the vertical axis shows the marginal utility of, say, the educational service. The horizontal axis shows the quantity measured in terms of efficiency units of education. The curve sloping downward from left to right is the demand curve for education: it is of the Blaug type, i.e. it is an aggregate of the individual demand curves which are drawn with respect to the difference of the expected rate of return on education over and above the prevailing market rate of interest.\(^1\)

This curve is a representative curve for the educational services as a

\(^1\)See [87], especially pp. 174-5 for the derivation of the demand curve for education. See also [51] Chapter 2 for the demand for education and the distinction between the consumption demand and investment demand for education.
Welfare effects of immigration: Education and Health Services Sectors

Immigration reduces the quantity available to the indigenous population from $OQ_h$ to $OQ'_h$.

Utility Loss = $Q'_h E_1 E_0 Q_h$

Resource Cost = $Q'_h E_0 BQ'_h$
whole. We assume that the demand function implicit in the curve is taken into consideration by the government when deciding on how much money to spend on education. Assume also that the number of units that the government can provide with a given amount of money is the same as would be available if services were sold in a competitive market.

Suppose that if the educational service had been provided in a competitive market the equilibrium price would have involved $OQ_h$ units at a price $OP_o$; the expenditure would have been $OP_oOQ_h$. Therefore if the government provided the same number of units, the marginal utility of education would be $OP_o$.

Now allow immigration into the model. Assume that initially the government does not extend the educational facilities and that the existing $OQ_h$ units have to be shared equally by the enlarged population. This case is illustrated in Figure X: if the ratio of immigrant/indigenous people receiving education equals $Q'_h/Q_h/OQ'_h$, the amount of units available to the indigenous population will be reduced to $OQ'_h$. The welfare loss suffered by the indigenous population will be measured by the area $Q'_hQ_hEOQ_h$. This area can be estimated as follows. Consider first the area $Q'_hAEOQ_h$. The base $Q'_h$ may be written as $(Ch - Ch + Ca)$ where $Ca$ stands for the number of educational units enjoyed by immigrants and $Ch$ is the corresponding amount for the indigenous population before the immigration. Now if we choose units such that $OP_o$ equals unity $Q'_hQ_h$ will measure the area of the rectangle. The area of the triangle

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1 Since the public expenditure on further education is very small compared with the expenditure on schooling, we take schooling as representative of the educational services as a whole.
AE_1E_0 can be written as:

$$AE_1E_0 = \frac{1}{2} (E_0A)(E_1A) = \frac{(Q_h - Q_h)^2}{-\alpha}$$

where $\alpha$ is the price elasticity of demand.

An alternative possibility is that the government may extend the educational services to meet the needs of immigrants and thereby restore the level of educational services available to each indigenous consumer. In this case there would be no loss of utility for the indigenous population. However, provision of the additional services will involve a resource cost. Assume that these extra units can be obtained under constant costs: their total cost is shown in the diagram by the rectangle $Q_hE_0B_0Q_p$, where $Q_h$ is equal to $\frac{C_m}{C_h} \times Q_h$. Now since we have assumed $OP_0$ equal to unity, the additional resource cost will be equal to $\frac{C_m}{C_h} \times Q_h$.

SECTION II

TRADED GOODS

In estimating the welfare effects arising from immigrants contributing to the supply and demand of traded goods, I adopt the framework of the two-country two-commodity model used by P.B. Kenen (62). The rest of the world will be considered as one country. Moreover, I will assume that immigration to the United Kingdom does not affect the supply and demand in the rest of the world. This assumption may be justified on the grounds that the majority of New Commonwealth

(4) Since $-\alpha = \frac{\partial h}{\partial P_h} / \frac{\partial h}{\partial P_h}$ where $\partial h = 1, \partial P = 1$ and $P_1 P_2 = P_1$.
immigrants have come from countries where per capita income and the productivity of labour are very low compared with that of the United Kingdom. The traded products will be aggregated into (i) import competing and (ii) export sectors. I will include in (i) agricultural products and food manufacturing and in (ii) I will include all other manufacturing. The analysis for each of the cases is made complicated by the fact that the products are subject to tariffs and consumption taxes (or producers receive subsidies) and that the raw materials required for the production of the final consumer goods may be partly imported and partly produced in the United Kingdom. In order to facilitate exposition of the analysis, I first show a simple model in which there are no government distortions, i.e. no taxes, tariffs etc., and where the traded products consist of final consumer goods only. Later on this simplifying assumption will be relaxed and a more complicated (but more realistic) model will be considered. One advantage of this two-step procedure is to show how the effects of immigration may depend on the presence of government taxes, tariffs, etc.

The Import Competing Sector: A Simple Model

The curves Qh and Sh in quadrant (i) of Figure XI show respectively the United Kingdom's demand and supply curves for a final consumer product while the curves Qw and Sw in quadrant (iii) are the corresponding curves for the rest of the world. In quadrant (ii) the curve Qx is the United Kingdom's excess demand curve while Sx is the rest of the world's excess supply curve. The equilibrium price is OPco: the United Kingdom produces OQo and consumes OQ1.

Now allow for immigration: the United Kingdom total demand and supply
Welfare effects of immigration: The import-competing sector without tax and tariff

Pre-immigration equilibrium is determined by: $Q_h = S_x$ or $Q_h = S_x$, $P_{w0}$.
schedules become \( Q_{n+Qm} \) and \( S_{n+Sm} \) respectively. The immigration is assumed to have no effect on the demand and supply schedules of the rest of the world. It is clear that, depending on the relative impact of immigration in adding to United Kingdom demand and supply, the world price could increase or decrease; moreover in the former case, if the price rise was sufficiently great the United Kingdom could become an exporter of the product. Thus in principle there are three cases. However, in order to avoid some unnecessary repetition, I will consider only the case of the price rise: the reason for this is that my empirical analysis (reported in Chapter V below) shows that that is the case relevant to the United Kingdom experience. In the figure the United Kingdom's post-immigration excess-demand curve is \( Q_{x}^{*} \) and the post-immigration equilibrium price is \( OP_{x} \). This rise in price causes the consumer's surplus of the indigenous population to fall by \( P_{o}BCP_{c} \) while their producer's surplus increases by \( P_{o}ADP_{p} \); the former will necessarily be of greater magnitude in the present case since the United Kingdom is an importer. Therefore in this case the indigenous population unambiguously loses welfare \((=ABCD)\) as a result of immigration\(^1\).

This conclusion should be contrasted with that for the non-traded sector depicted in Figure IX: whereas in the latter case the indigenous population unambiguously gains as a result of an immigrant-induced price change, in an open economy context there may be a gain or loss depending on how the import price is affected.

\(^{1}\)This conclusion is comparable to that of P.B. Kenen's model described in Chapter 2.
The Import-Competing Sector: A more complicated model

I now introduce two complications to gain greater realism. (i) the United Kingdom levies tariffs on imports and also a tax on consumption of importables and of the import-competing product. (ii) Some of the imports consist of raw materials that are used in the production of the import-competing final product. Recognition of the latter complication makes it necessary to disaggregate the supply curve of the final product into the raw materials and 'value added' components. Figure XII illustrates the welfare effects. In quadrant (i) Sr is the supply curve of the raw materials: it is an aggregation of supplies from home and foreign sources. Shv is the supply curve of value added. Aggregating these yields Shf, the supply curve of the final product; the construction of this curve is considered in more detail in Appendix II.

Qh is the United Kingdom's demand curve for the product while Qhc is the curve deflected by an ad valorem consumption tax (of DC/CQ1 per cent). Using Qhc and Shf we derive the United Kingdom's excess demand curve for the final product: this is shown by Qxc in quadrant (ii). Sx in quadrant (ii) is the rest of the world's supply curve of exports to the United Kingdom: Sxt shows that curve inclusive of the United Kingdom's import tariff (of PwoPso/OPvo per cent). The intersection of Sxt and Qxc shows that the tariff inclusive equilibrium price is OPso. Transferring this price to quadrant (i) we see that the United Kingdom production is OQo. In turn this shows that the price of the raw material content is OPvo, while the price of value added is OPvo. Consumers pay the price OPvo and demand is OQo. The United Kingdom gets tariff revenue equal to PwoABPso and tax revenue equal to PsoCDPco.

1 Although there is a controversy about the concept of value added, I use it here since it helps a useful purpose. See (37).

2 I assume without violating reality that there is no tariff on the raw material imports.
Pre-immigration equilibrium is determined by \( Q_{xc} = S_{tx} \).

Post-immigration equilibrium is determined by \( Q_{xc} = S_{tx} \).
Now allow for immigration. In principle the immigrants could be employed either in the value added stage or in the production of the raw materials. In actual fact, since a very small proportion of the New Commonwealth immigrants have found employment in the mining and agriculture sectors, I will assume that immigrants work only in the value added sector. Quadrant (iii) depicts the post-immigration situation. The curve ShV+Smv shows the supply curve of value added while the curve Sr is reproduced from quadrant (i). ShV is the supply curve of the final product. (The relationship between these is further discussed in the Appendix). Qh+Qm shows the post-immigration demand curve while Qhc+Qmc shows that curve deflected by the consumption tax of the initial rate. From ShV and Qhc+Qmc we get the excess demand curve Qmc shown in quadrant (ii). The intersection of Sxt and Qmc gives the post-immigration price OPs1; (in anticipation of my empirical findings the diagram illustrates only the possibility of a price increase).

Transferring the price OPs1 to quadrant (iii) we find that production is OQ2, the price of the raw material is OPx1 while the price of value added is OPv1. Note that the diagram illustrates an increase in the price of raw materials but a decrease in the price of the value added activity. The reasoning behind this result is as follows. The increase in the price of the final product implies that immigration will have increased demand for raw materials; therefore the price of raw materials will increase. On the other hand, since immigration adds to the supply as well as demand for the value added activity, the price of the value added may decrease or increase: the diagram illustrates a fall in this price in confirmation with my empirical findings. Consumers pay the price OPc1.

1 The number of New Commonwealth immigrants working in agriculture and mining was in the region of 1900 both in 1961 and 1966. See Duncans and Smith, op. cit. p. 175.
demand is 0QQ. The government collects PsEFPc in tax revenue and PwNHPs in tariff revenue.

The net impact of immigration on the welfare of the indigenous population is as follows. The change in consumer's surplus = PcoPcKD shown in quadrant (l). The change in the surplus of the producers in the value added sector = PvoVTv. The change in the surplus of raw material producers = Rm(ProPrGR), where Rm is the share of United Kingdom raw material producers. The pre-immigration tax and tariff revenues are respectively PscCPPc and PwoABPso. The corresponding areas after immigration are PsEFPc and PwNHPs; the share accruing to the indigenous population will be estimated on the assumption that the government redistributes the revenues equally among all the inhabitants of the United Kingdom. To sum up, the welfare effects of immigration are:

-PcoDKPc + Rm(ProGRPr) - PvoVTv + (Hd/(Hd+Md))(PwNHPs + PsEFPc) - (PwoABPso + Psos)

where Hd = indigenous population, Md = the immigrant population. The indigenous population will have an increase (decrease) in welfare according as the above expression is positive (negative).

The implications of this are fairly apparent. By introducing the complications of (i) the imports of raw materials as well as final products and (ii) taxes and tariffs we see that immigration may increase the welfare of the indigenous population and that this may happen even if it increases the c.i.f. prices (and the consumer price) of the final product. The general point is that as with international trade, immigration...

1 For purposes of empirical estimation this share is assumed to be equal to the share of United Kingdom producers in total supplies of the raw material during the relevant years.
in the presence of distortions may either decrease or increase welfare.

The Export Sector: A Simple Model

We illustrate the welfare implications of this case with the help of Figure XIII. In quadrant (i) of the figure, the curves $Q_h$ and $S_h$ show respectively the United Kingdom's demand and supply curves for the export product, while the curves $Q_w$ and $S_w$ in quadrant (iii) are the corresponding curves for the rest of the world. In quadrant (ii) $S_{xh}$ is the United Kingdom's excess supply curve and $Q_{wx}$ is the rest of the world's excess demand curve. The intersection of these two curves determine the pre-immigration equilibrium price ($=O_{Pwo}$): the United Kingdom will produce $OQ_3$, export $QoQ^*$, and consume $OQ_0$.

After the immigration the United Kingdom total demand and supply schedules become $Q_h+Q_m$ and $S_h+S_m$, respectively. The excess supply curve becomes $S_{xh}^*$. (As in the import case immigration is assumed to have no effect on the demand-supply schedules of the rest of the world). The post-immigration equilibrium price is $O_{Pw}$ ($=O_{Ps}+O_{Ps}^*1$: the United Kingdom produces $OQ_3$, exports $Q_2Q^*$, and consumes $OQ_2$. The fall in price causes the consumer's surplus of the indigenous population to go up by $P_{c}P_{c}^*$ while the producers' surplus goes down by $P_{s}P_{s}^*$. Since the latter change more than offsets the former, the indigenous population unambiguously loses as a result of immigration, the area $ABCD$ showing the net welfare loss.

---

1 I consider here the implications of a price fall because my empirical findings reported below show that that is the relevant case to the United Kingdom experience.
Figure XIII

Welfare effects of immigration: The export sector without tax and tariff

Pre-immigration equilibrium is determined by: $S_h - Q_h = Q_w - S_w$ or $S_{xh} = Q_{xw}$

Post-immigration equilibrium is determined by: $S_h + S_{xh} = (Q_h + Q_{xh}) = Q_w - S_w$ or $S_{xh} = Q_{xw}$
The Export Sector: A More Complicated Model

Let us now introduce the two complications considered above in the import competing case; (i) the United Kingdom levies a consumption tax while the rest of the world imposes a tariff on the imports from the United Kingdom, and (ii) the United Kingdom imports some of the raw materials used in the production of the exportables.

The welfare implications are shown with the help of figure XIV. In quadrant (i) the United Kingdom's demand curve for the final product is $Q_h$ while $Q_{hc}$ is the demand curve deflected by an *ad valorem* consumption tax. The curves $S_{hf}$, $S_{hv}$, and $S_r$ show respectively the supply of the final product, the value added, and the raw materials. (As before we obtain $S_{hf}$ by aggregating $S_r$ and $S_{hv}$). In quadrant (ii) $S_x$ is the excess supply curve of the United Kingdom (which we obtain from $S_{hf}$ and $Q_{hc}$ of quadrant (i)) while $S_{xt}$ is the excess supply inclusive of the foreign tariff. $Q_{xw}$ is the excess demand curve of the rest of the world. Intersection of $S_{xt}$ and $Q_{xw}$ gives the equilibrium price in the world market: this price is $OP_{wo}$. The price received by the United Kingdom producers will be $OP_{so}$. (Of this $OP_{ro}$ goes to raw material producers and $OP_{vo}$ to value added). Transferring this price to quadrant (i) we see that the United Kingdom production is $OQ_1$ and consumption is $OQ_0$. The government collects $P_{so}C_{so}$ in consumption tax revenue - the tax expressed as a proportion of the producer's price being $P_{co}P_{so}/OP_{so}$.

The post-immigration situation is depicted in quadrant (iii). The curve $S_{hv}+S_{mv}$ shows the supply curve of value added while the curve $S_r$ is reproduced from quadrant (i)\(^1\). Adding these we get the supply curve

\(^1\)As in the import case, we assume that immigrants find work only in the value added stage.
Welfare effects of immigration: The export sector with tax and tariff

Pre-immigration equilibrium is determined by: \( S_{xt} = Q_{xw} \)

Post-immigration equilibrium is determined by: \( S_{xt} = Q_{xw} \)
of the final product, \( S_{h} \). As previously \( Q_{h}Q_{m} \) shows the demand curve and \( Q_{hc}Q_{mc} \) shows that curve deflected by the consumption tax. The excess supply curve is now \( S_{x}^{*} \) shown in quadrant (ii); \( S_{xt}^{*} \) shows that curve inclusive of the tariff. \( S_{xt}^{*} \) and \( Q_{xw} \) determine the post-immigration equilibrium price \( OPw \). The price received by the United Kingdom producers is \( OPs \) - the price of the raw material content is \( OPs \) while the price of value added is \( OPv \). (Note that \( PwPso/OPso = PwPso/OPs \)). At this price the United Kingdom produces \( OQ_{3} \) and consumes \( OQ_{3} \). The government collects \( PsoEFPc \) in consumption tax revenue. (Note that \( P_{c}P_{o} = P_{o}P_{s}P_{o} \)). Transferring the prices \( OPc_{x} \), \( OPv_{x} \) and \( OPs_{x} \) to quadrant (i) we find the increase in the consumer's surplus \( (= P_{c}KDPc_{x}) \), the decrease in surplus of value added producers \( (PVoVTPv_{x}) \) and the increase in the surplus of the raw material producers \( (= ProGRPr_{x}) \). Of the last mentioned, the share accruing to United Kingdom producers is assumed to be equal to the share of their production in United Kingdom raw material consumption. Regarding the tax revenues we assume that the United Kingdom government redistributes these equally among the inhabitants of the United Kingdom. Bringing these changes together we can say that the indigenous population of the United Kingdom benefits as a result of immigration if:

\[
Pc_{o}DKPc_{x} = \frac{Pv}{(1d/Hd+md)}\left(\frac{Ps_{x}EFPc_{x}}{PsoCDPc_{x}}\right) - PsoCDPC_{x} > 0\]

where \( Rm = the \ share \ of \ indigenous \ raw \ material \ production \ in \ the \ United \ Kingdom \ raw \ material \ consumption, \ Hv = the \ indigenous \ population \ and \ Hv = the \ New \ Commonwealth \ immigrants. \ The \ implication \ of \ this \ is \ that \ whereas \ in \ the \ simple \ model \ an \ immigration-induced \ fall \ in \ the \ export \ price \ would\]

\[As \ shown \ in \ the \ diagram \ as \ the \ Ps \ (or \ Pc) \ goes \ down \ the \ Pr \ goes \ up \ while \ the \ Pv \ goes \ down. \ The \ reason \ for \ this \ is \ as \ follows. \ After \ the \ immigration, \ as \ the \ quantity \ supplied \ of \ the \ final \ product \ goes \ up, \ more \ raw \ materials \ are \ demanded; \ the \ Pr \ goes \ up. \ Since \ Ps = Pr + Pv \ the \ Pv \ has \ to \ go \ down.\]
unambiguously reduce welfare of the indigenous population; when tariff and taxes are allowed for immigration may increase the welfare of the indigenous population even though it may cause a decline in the export price.

Summary

Our analysis of the traded sector shows that, as with international trade, immigration in the presence of distortions may either increase or decrease welfare. The possibility of a welfare increase is compatible with an increase in the import price and a decrease in the export price, i.e. a deterioration in the country's terms of trade. One implication of this, which suggests a criticism of the research by Mishan and Needleman among others, is that our concern should not be with the effect of immigration on the terms of trade but rather on how the change in the latter may affect welfare of the indigenous population.
Non-Traded Goods and Services: Transport and New Housing Sectors

The empirical analysis of the welfare effect for transport and new housing, illustrated in Figure IX by the area of the triangle ABEo, is undertaken with the help of the following model.

The pre-immigration demand equation is:

(1) \( Q_h = H_d A P^\alpha Y_h^\beta \)

where \( Q_h \) is the demand of the indigenous population of the United Kingdom, \( H_d \) is the size of the indigenous population, i.e. number of heads, \( A \) is a parameter, \( P \) is the price, \( Y_h \) is the per capita income of the indigenous population, and \( \alpha \) and \( \beta \) are respectively the price and income elasticities of demand. The pre-immigration supply equation is:

(2) \( S_h = H_s B P^\lambda \)

where \( S_h \) is the quantity supplied by the indigenous population, \( H_s \) is the number of indigenous workers employed in the sector, \( B \) is a parameter, and \( \lambda \) is the price elasticity of supply. Pre-immigration equilibrium price level, which we denote by \( P_0 \), is determined by setting \( Q_h = S_h \); therefore

(3) \( P_0 = \left( \frac{H_d A Y_h^\beta}{H_s B} \right)^{\lambda - \alpha} \)

Note that although the equations imply that the demand and supply schedules are non-linear, we will for simplicity assume that the segments AEO and BEO are straight lines; the justification for this procedure is that the proportionate changes \( P_1/P_0 \) turn out to be very small.
The immigrants are assumed to have the same price and income elasticities as the indigenous population. So, we can write their demand equation as:

\[ Q_m = M_d A P^\alpha Y_m \]

where \( M_d \) represents the size of the immigrant population and \( Y_m \) denotes their per capita income. Each worker is assumed to be employed with the same amount of capital as an indigenous worker and that the production function is the same for the two groups: the price elasticity of supply will therefore be the same for the two groups. Then the supply equation of immigrants can be written as:

\[ S_m = M_s B P^\lambda \]

where \( M_s \) is the number of immigrants working in the sector. Adding equations (1) and (4), and (2) and (5) we get respectively the post-immigration demand and supply equations of the total population of the United Kingdom:

\[ Q = A P^\alpha (M_d Y_h + M_d Y_m) \]

\[ S = B P^\lambda (M_s + M_m) \]

From equations (6) and (7) we find the post-immigration equilibrium price, which we denote by \( P_1 \):

\[ P_1 = \frac{\lambda - \alpha}{\lambda} \left( \frac{A (M_d Y_h + M_d Y_m)}{B (M_s + M_m)} \right) \]

Now the welfare triangle \( A E O B = A E O + B E O = \frac{1}{2} (AC)(CE_o) + \frac{1}{2} (BC)(CE_o) \)

we know that \( AC = -\alpha \cdot Q_o \left( \frac{OP_4}{OP_o} - 1 \right) \quad BC = \lambda \cdot Q_o \left( \frac{OP_4}{OP_o} - 1 \right) \)

and \( CE_o = OP_4 - OP_o \). For simplicity set \( Q_o = OP_o = 1 \). Then we get

\[ A E O = -\frac{1}{2} \alpha (OP_4 - 1)^2 \quad \text{and} \quad B E O = \frac{1}{2} \lambda (OP_4 - 1)^2 \]

Therefore \( A E O B = \frac{1}{2} (\lambda - \alpha)(OP_4 - 1)^2 \)
APPENDIX II

Traded Goods

I will proceed in two stages. First, I use a system of equations to find the effect of immigration on the prices of traded products. Following that the price changes are used to estimate the welfare impact.

A. The Import Competing Sector

The welfare effects are estimated from the following set of equations.

The supply of raw materials for use in the United Kingdom's manufacture of the final product is

\[ S_r = BrHrP_r^\lambda \]  

where \( S_r \) is the quantity supplied (by home and foreign suppliers), \( Br \) is a parameter, \( Hr \) is the number of people employed in the production of raw materials (at home and foreign supplying countries), \( P_r \) is the price and \( \lambda \) is the price elasticity of supply of raw materials. The supply of value added factors\(^1\) in the United Kingdom is

\[ S_{hv} = BvhvP_v^\lambda \]

where \( S_{hv} \) is the quantity supplied, \( Bv \) is a parameter, \( Hv \) is a variable where meaning is explained below, \( P_v \) is the price and \( \lambda \) is the price elasticity of supply of the import competing product. By choice of units we set \( Br = Bv \). Note that for simplicity we assume that the magnitude of

\(^1\)Although there is controversy about the concept of value added, I use it here since it helps a useful purpose. See [57] for more on the controversy.
the supply elasticity is the same in the two stages of production.

The supply of the final product is:

\[ (11) \quad S_{hf} = \text{I} \lambda \text{B} \text{P}_{g} \]

where \( S_{hf} \) is the quantity supplied of the final product, \( B \) is a parameter (and \( B = B_r = B_v \)), \( \text{I} \lambda \) is the total number of people employed in the production of the final product, \( P_s \) is the suppliers' price, and \( \lambda \) is the price elasticity of supply of the final product. The relationship between (9), (10) and (11) is given by the condition that

\[ P_s = \text{Pr} + \text{Pv} \]

The meaning of \( \text{Hv} \) can now be explained. Since by choice of units a 'unit quantity' of value added equals a unit quantity of the final product we have \( \text{I} \lambda \text{B} \text{P}_{g} = \text{H} \text{V} \text{B} \text{V}_{p} \); with \( B = B_v \) we get \( \text{Hv} = \left( \frac{1}{\text{V.A.}} \right) \lambda \text{H} \), where \( \text{V.A.} = \text{Pv} / P_s \), i.e. the share of value added in the final product price.

The demand for the final product on the part of the United Kingdom's indigenous population is

\[ (12) \quad Q_{hc} = \text{HdA} \left( \frac{1}{1+\text{d}} \right)^{\alpha} \gamma_{h}^{\beta} = \text{H}^{d} \text{A}^{\alpha} \gamma_{h}^{\beta} = \text{HdA} \gamma_{h}^{\beta} \]

where \( Q_{hc} \) is the quantity demanded, \( \text{Hd} \) is the indigenous population of the United Kingdom, \( A \) is a parameter, \( P_s \) is the suppliers' price, \( \alpha \) is the price elasticity of demand for the final product, \( d \) is the amount of tax expressed as a constant proportion of the suppliers' price, \( \gamma_{h} \) is the per capita income of the indigenous population, \( \beta \) is the income elasticity of demand for the final product, \( \text{Hd}^{d} = \left(1+\text{d}^{\alpha} \right)^{\alpha} \), and \( P_c \) is the price paid by consumers. The United Kingdom's demand curve for imports of the final product is got from (11) and (12):

\[ (13) \quad Q_{xc} = (Q_{hc} - S_{hf}) \]
The rest of the world's supply of the final product to the United Kingdom is

\[(14) \quad Sx = (Sw - Qw) = WsBP^\lambda_w - WdAp^\alpha_w Y^\beta_w \]

where \(Sw\) and \(Qw\) are respectively the rest of the world's supply of and demand for the final product, \(Ws\) is the total number of people employed in the production of the final product (including agriculture) in the rest of the world, \(B\) is a parameter\(^1\), \(Pw\) is the price in the rest of the world\(^2\), \(\lambda\) is the price elasticity of supply of the final product, \(Wd\) is the population of the rest of the world, \(A\) is a parameter, \(\alpha\) is the price elasticity of demand for the final product\(^3\), \(Yw\) is the per capita income in the rest of the world, and \(\beta\) is the income elasticity of demand.

If the United Kingdom imposes tariff on the import of the final product the foreign supply curve facing the United Kingdom becomes:

\[(15) \quad Sxt = WsBP^\lambda_w (1+t)^\lambda - WdAp^\alpha_w Y^\beta_w \]

where \(t\) is the ad volorem tariff rate, and \(Pw(1+t) = Ps\).

The United Kingdom's c.i.f. import price which, under competition, is also the price of the final product received by United Kingdom producers is obtained by equating (13) and (15). On solving, and denoting this equilibrium price by \(Pso\), we get:

\[1\text{We assume that } A \text{ and } B \text{ are the same in the U.K. and the rest of the world.}\]
\[2\text{It is assumed that there is no consumption tax on the final product in the rest of the world.}\]
\[3\text{All the elasticities are assumed to be the same in the U.K. and the rest of the world.}\]
The demand and supply equations of the immigrants are:

\[ Q_{mc} = M_d \alpha^\alpha (1+d) \alpha^\beta = M_d \alpha^\alpha Y_m^\beta \]

\[ S_{mv} = BM_s P_s^\lambda \]

where \( Q_{mc} \) is the quantity demanded by immigrants, \( M_d \) is the New Commonwealth immigrant population, \( Y_m \) is their per capita income, \( M_d^\alpha = M_d (1+d) \alpha \), \( S_{mv} \) is the quantity of the final product supplied by immigrants, and \( M_s \) is the number of immigrants employed in the manufacture of the final product. (Recall that we assume that immigrants are employed only in the value added stage).

The post-immigration supply curve of the final product is:

\[ S^{*}_{hf} = S_{hf} \left( \frac{M_s + H_s}{M_s + H_s - V.A.M_s} \right) \]

where \( V.A. \) is the share of the value added in the price of the final product before immigration. The proof of this is as follows:

In Figure XV the labels of the curves have the same meaning as in Figure XII. Before the immigration we have \( AD = AC+AB \). After immigration we have \( Aj = AB+AG \). And since \( DC = AB = G \) we have that \( Dj = CG \). Now the problem is to find the extend of the proportional shift of the \( S_{hf} \) curve, i.e. \( S^{*}_{hf}/S_{hf} \). Diagramatically this means finding \( FN/DF \). Now since \( \frac{FN}{DN} = \frac{AD}{Dj} \) and since \( AD = OP = 1 \) (by choice of units) we have \( \frac{FN}{DN} = \frac{1}{GC} \). Next:

\[ GC = \left( \frac{CH}{EH} \right) OE \]

where \( CH/EH = \frac{M_s}{M_s + H_s} \) (i.e. the proportion of immigrant
Figure XV

$S_{hf}$

$S_{hv}$

$S_{hv} + S_{mv}$

$S_r$
workers in the total working force) and OE = the share of value added in the price of the final product. V.A. stands for the share of value added expressed as a proportion of OP. We can therefore write:

\[
\frac{DN}{FN} = \left( \frac{V.A. M_h}{M_h + H} \right) \quad \text{or} \quad FN = DF \left( \frac{M_h + H}{M_h + H - V.A.N} \right)
\]

Therefore

\[
S_{hf}^* = S_{hf} \left( \frac{H + H}{M_h + H - V.A.N} \right)
\]

The demand for imports after immigration can now be written as

\[
Q_{xcm} = Q_{hc} + Q_{mc} - S_{hf}^* = A \beta \left( \frac{H + H}{d', h, m, y^m, w^m} \right) - S_{hf} \left( \frac{M + H}{M_h + H - V.A.N} \right)
\]

The equilibrium c.i.f. import price is got by equating (15) and (21). Denoting this by \( P_s^* \) we have:

\[
P_s^* = \sqrt{\frac{A \left( \frac{H + H}{d', h, m, y^m, w^m} \right)}{B \left[ H \left( \frac{M + H}{M_h + H - V.A.N} \right) + W \right]}}
\]

B. The Export Sector

The equations for the export sector are the same as in the import-competing case. The only difference arises because the United Kingdom will have no tariff while its exports may force a foreign tariff.

Before immigration the United Kingdom demand for the final product is:

\[
Q_{hc} = H \delta \delta \left( 1 + d \right) \beta \gamma \delta \delta = H \delta \delta \delta \delta \left( \delta + \delta \right) \beta \gamma \delta \delta \quad \text{(or} = H \delta \delta \delta \delta \left( \delta + \delta \right) \beta \gamma \delta \delta \)\)

The export supply curve of the final product is obtained from (11) and (12*):
(13*) \( S_x = H_s P_s^\lambda - H_d A P_s^\alpha \gamma^\beta \)

If there is a foreign tariff of, say, \( T \) per cent the export supply facing foreign consumers becomes:

\[
(14*) \quad S_{xT} = H_s P_s^\lambda (1+T)^\alpha - H_d A P_s^\alpha (1+T)^\gamma \beta = H_s P_s^\lambda - H_d P_s^\alpha \gamma^\beta
\]

where \( P_w = P_s (1+T) \)

The rest of the world's demand curve for imports from the United Kingdom is:

\[
(15*) \quad Q_{xw} = Q_w - S_w = W_d A P_s^\alpha \gamma^\beta - W_s P_s^\lambda
\]

The pre-immigration equilibrium price in the rest of the world, \( P_{wo} \), is obtained by equating (14*) and (15*). On solving we get:

\[
(16*) \quad P_{wo} = \sqrt{A(H_d^\alpha h + W_d^\gamma w) \over B(H_s^\alpha s)}
\]

The price received by United Kingdom exporters is got from

\[
P_{so} = P_{wo} / (1+T)
\]

while the price for the United Kingdom consumers is got from

\[
P_{co} = P_{so} (1+d).
\]

The demand and the supply equations of the immigrants are the same as in the import-competing case.

The supply curve of the final product is:

\[
(20) \quad S_{hf}^* = S_{hf} \left( \frac{M_s + H_s}{M_s + H_s - V_A M_s^v} \right)
\]

The excess supply of the United Kingdom now becomes
(21\*) \( S_x^* = S_{hf}^* - (Q_{hc} + Q_{wc}) \)

where \( S_{hf}^* \) is derived as in the import-competing case. The foreign tariff means that the export supply facing foreign consumers is:

\[
S_{XT}^* = H_s \beta \omega \left( \frac{M_s + N_s}{M_s + H_s - V, \Lambda, M_s} \right) - \lambda \frac{\beta}{\beta} (H_d \beta_m + H_d \beta_y) \]

The equilibrium price in the rest of the world is obtained by setting (15\*) equal to (23). On solving, and denoting this new price by \( P_{w_1} \), we get

\[
P_{w_1} = \sqrt{\frac{\lambda (H_d \beta_m + H_d \beta_y + H_d \beta_y)}{H_s \left( \frac{N_s + N_s}{M_s + H_s - V, \Lambda, M_s} \right) + B_s}}
\]

And using the relationships \( P_{s_4} = P_w/(1+T) \) and \( P_{c_1} = P_s (1+d) \)

we get respectively the prices for United Kingdom producers and consumers.

**WELFARE CHANGES**

Having found the price changes due to immigration we can now evaluate the welfare changes. For convenience I reproduced Figure XII to show the relevant areas to be evaluated. (Since the areas involved in the import-competing and the export sectors are very similar, I shall evaluate the areas only for the former sector). The calculations may be simplified by choosing units to set the value of the United Kingdom consumption in the initial year equal to unity - i.e. in Figure XII we set \( OP_{s_0} = 1 \) and \( OQ_{1} = 1 \).

Let us start with the change in the consumer's surplus:
Welfare effects of immigration: The import-competing sector with tax and tariff

Pre-immigration equilibrium is determined by: \( Q_{x} = S_{xt} \)

Post-immigration equilibrium is determined by: \( Q^{*} = S^{*} \)
Now we know that:

\[ P_{co}c_1^{P} = \left( \frac{OP_{so} - OP_{s_1}}{OP_{so}} \right) (1+d) \]

Also \( P_{co}K = (P_{co}D)^{K} \) and \( K^{D} = \frac{\alpha}{1 - \frac{OP_{so}}{OP_{s_1}}} \)

where \( \alpha \) is the price elasticity of demand. Substituting these values into (C1) we can find the change in consumer's surplus.

The change in the raw material producers' surplus accruing to United Kingdom suppliers is:

\[ (C2) \quad R_{m} \left[ \frac{P_{ro}GRF_{r_1}}{P_{ro}P_{r_1}} \right] = R_{m} \left[ \frac{1}{(P_{ro}P_{r_1})} \right] (OQ_{2} + OQ_{3}) \]

where \( R_{m} \) is the share of the United Kingdom raw material producers in the total raw material supplies of the United Kingdom. We know that:

\[ R_{ro}P_{r_1} = \frac{(OQ_{2} - 1)}{\lambda} \cdot (1 - V.A.) P_{so} \]

where \( \lambda \) is the price elasticity of supply, and \( V.A. \) is the share of the value added in the price of the final product.

Also \( OQ_{2} = \frac{N \cdot BP_{s_1}^{\lambda}}{\frac{M_{s} + H_{s}}{(M_{s} + H_{s} - V.A. N_{s})}}\) \( OQ_{1} \)

where \( N_{s} \) and \( M_{s} \) are respectively the number of indigenous and immigrant workers employed in the production of the final product.

And \( OQ_{0} = \frac{N \cdot BP_{s_0}^{\lambda}}{OQ_{1}} \)
Substituting these into equation (C2) we get the change in the raw material producers' surplus.

The change in the surplus of producers in the value added stage is

\[(C3) \quad P_{vo} VTP_v = \frac{1}{2} (P_{vo} P_v) (P_{vo} V + P_v T)\]

Now we can write \(P_v T = H_v E (OP_{v_1} - OP_{r_1})\)
where \(H_v\) is defined above.

By making use of the definition of the supply elasticity we get

\[OP_{r_1} = \left(1 + \frac{0Q_2}{0Q_0} - 1\right) (1-V.A.) P_{so}\]

and \(P_{vo} P_v = \left(0Q_0 - P_{v_1}\right)/0Q_0 \left(V.A. P_{so}\right)\)

Substituting these values into (C3) we find the change in the surplus of 'value added' producers.

The pre-immigration tax revenue is

\[(C4) \quad P_{co} P_{so} CD = (P_{co} P_{so})(P_{so} C)\]

Now \(P_{so} C = 0Q_{v_1} = 1\) and \(P_{co} P_{so}\), being the amount of tax as a proportion of the producers price, can be written as \(OP_{so} d\), where \(d\) is the rate of tax (and since \(P_{so} = 1\) \(d\) is also the amount of tax.

The tax revenue after immigration is

\[(C5) \quad P_{c_1} P_{s_4} EF = (P_{c_1} P_{s_4})(P_{s_4} E)\]

Now \(P_{s_4} E\), being the consumption after immigration, is obtained from the (post immigration) demand equation and equilibrium price. \(P_{c_1} P_{s_4}\) is the amount of tax revenue per unit quantity and is got from the tax rate and
the producer's price.

The pre-immigration government tariff revenue is:

\[(C6) \quad P_{wo} \Delta B_{so} = (O_0 Q_1) (P_{wo} P_{so})\]

where \(P_{wo} P_{so}\) is the amount of tariff duties per unit import.

Finally, tariff revenue after immigration is

\[(C7) \quad P_{w1} \Delta B_{s1} = (O_0 Q_3 - O_0 Q_2)(P_{s1} P_{w1})\]

where \((O_0 Q_3 - O_0 Q_2)\) is the level of imports and can be estimated from the system of equations.
CHAPTER V

THE EMPIRICAL ESTIMATES
THE EMPIRICAL ESTIMATES

This chapter presents empirical estimates of the welfare effects analysed in the previous chapter. (The data used in the calculations are shown in Appendix Tables I and II). As mentioned there, the main industries whose supply and demand have been affected by immigration are public transport, new housing, the educational and health services and the foreign trade sector. The empirical estimates are made for the years 1951 to 1966: the former is chosen because there was little immigration from the New Commonwealth prior to that year while the latter is the most recent year for which Census of Population data is available. An initial problem, common to all these industries, is that whereas the immigrants arrived in each of the years during this period some of the data required to estimate the welfare effect is available for only a few of these years. For this reason I will proceed on the basis of two alternative assumptions:

Assumption I

The immigrants that arrived during 1951-1961 actually arrived in 1951. On the basis of this assumption I will estimate the welfare impact on the indigenous population of 1951.

Assumption II

All these immigrants arrived in 1961. This assumption permits an estimate of the impact of immigration on the indigenous population of 1961. Similar assumptions are made for immigration during 1961-66.
NON-TRADED GOODS AND SERVICES SECTOR

1. Market-Determined Prices

A. Transport Services:

The welfare gain accruing to the indigenous population is shown by the area ABEo in Figure IX. As proved in Appendix I the size of this area depends, among other things, on the magnitude of the price elasticity of supply and demand and on the income elasticity of demand. For the price elasticity of supply denoted by $\lambda$ there were no estimates (to my knowledge) available. So, my choice of values for $\lambda$ has been quite arbitrary. However, I tried to use as wide-ranging values as possible to cover what I thought the possible values $\lambda$ could take: I used six values ranging between 0.2 and 2.2 with mean difference $= 0.4$. As for the price elasticity of demand, $\alpha$, I used a range of values that encompasses those obtained in London Transport Board's experience over the last few years. (See(7)). I have used six values for $\alpha$ ranging between $-0.24$ and $-0.74$ with mean difference $= 0.10$. The estimated income elasticity of demand, $\beta$, for transport services is 2.48 for the year 1961 (See(5)). My choice of values has been around this figure: five values ranging between 1.50 and 3.50 with mean difference 0.50.

These elasticities give 180 estimates of the welfare change. Table I shows only the highest and the lowest estimates. Thus, the top two figures in the first column show that if all the New Commonwealth immigrants that came during the 1951-1961 had in fact come in 1951, the indigenous population of 1951 would have enjoyed a welfare gain equal to at most 0.009 per cent and at least 0.0013 per cent of the value of the net output of transport services (of that year). Similarly the figures in the first
### TABLE III

Welfare effects of immigration: Transport and new housing sectors

<table>
<thead>
<tr>
<th></th>
<th>1951 to 1956</th>
<th>1961 to 1966</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assumption I</strong></td>
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<td></td>
</tr>
<tr>
<td>Highest</td>
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<td>0.0000979</td>
</tr>
<tr>
<td>Lowest</td>
<td>0.0000133</td>
<td>0.0000931</td>
</tr>
<tr>
<td><strong>Assumption II</strong></td>
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<td></td>
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<td>Highest</td>
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<td>0.0000204</td>
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<tr>
<td>Lowest</td>
<td>0.0000151</td>
<td>0.00000689</td>
</tr>
</tbody>
</table>

Welfare gain as a % of value of net output
column of the fifth and sixth rows show that if the immigrant population of 1966 had come entirely in 1961, the welfare gain enjoyed by the indigenous population of 1961 would have been at least 0.00002 and at most 0.0143 per cent of the value of net output of the transport services in 1961.

Three points about these results may be noted. First, the welfare impact is extremely small. Secondly the impact does not differ very much as between the 1951-61 period and 1961-66 period; (The arithmetic mean of the upper four figures in the table is 0.000060429 and of the bottom four figures is 0.000044345). This result is significant since the ratio of dependant to worker in the immigrant population was much higher in the latter period. Thirdly, even though all the estimates are very small they are quite sensitive to the magnitude of the price elasticities: the greater the elasticities, the smaller is the welfare gain. The common sense reason for this is that the welfare gain depends ceteris paribus on the extent of the price change caused by the introduction of immigration and that the higher the elasticities, the smaller is the price change.

B. New Housing

The welfare gain accruing to the indigenous population is shown by the area ABEO in Figure IX; the procedure to estimate this is the same as in the transport sector. There were no estimates available (to my knowledge) for the price elasticity of supply \( \alpha \) in new housing. I have used six arbitrary values for it (ranging between 0.2 and 2.0 with mean difference \( = 0.4 \)) hoping that these would cover all the values \( \alpha \) could take. As for the price elasticity of demand, \( \omega \), G.Buchanan (13) informs us that "early estimates concluded that demand for housing was very price-inelastic, but Muth has found price elasticities of between 0.5 and
The values I used for $\alpha$ include these values: six values ranging between -0.25 and -1.5 with mean difference = 0.25. The above source informs us on the income elasticity of demand, $\beta$, as well.

"Evidence in this country is even less conclusive, since there are no published elasticity estimates.... what material there is, however, supports the estimate that income elasticity is probably around unity at present". (p.136). The estimates I used, five figures ranging between 0.2 and 1.8 with mean difference = 0.4, include this figure.

Thus, there are 180 estimates in all. Table III reports only the highest and the lowest values obtained (for each of the two assumptions and for each period of years). For example, the top two figures in the last column show that if the immigrants that came between 1951-61 had actually come in in 1951, the welfare gain accruing to the indigenous population of 1951 would have varied between .00310 per cent and .000368 per cent of the value of output of new housing in 1951. As in the case of transport, the average welfare impacts of the first and the second periods do not differ very much: the average for the first period is .00002994 and for the second period is .000030532. The smallness of the figures mean that as far as new housing is concerned, the inflow of New Commonwealth immigrants and their employment in new housing did not affect prices in the new housing market to any important extent. This inference is supported by the findings of Wilkinson and Gulliver (64) ".... when all factors are taken into account there is no substantial evidence that non-whites cause house prices to fall; either they have no effect or they are associated with above average prices... In so far as any effect is discernible, it is to raise the level of price rather than to lower it" (p.35).
As in the case of transport, the welfare impact is smaller the higher are the elasticities; moreover, the highest and the lowest figures for each year (relating to each assumption) are quite close to each other.

II. Non-Traded Goods and Services: Government Administered Prices

A. Educational Services

In this section we have two alternative measures of the welfare effects: the utility loss suffered by the indigenous population \( = \sum E_i^O \) and the resource cost incurred by the government \( = \sum E^O \).

In our theoretical analysis we showed that these effects could be measured in terms of the effect of immigration on the number of units of educational service available to the indigenous population. The decrease in these units, which was shown by the distance \( OQ_h \) in Figure X (which has been reproduced below), was measured as the ratio \( C_h/(C_h+C_m) \) where \( C_h \) and \( C_m \) are respectively number of educational units enjoyed by the indigenous and the immigrant populations. Now our problem is that data on \( C_h \) and \( C_m \) are not available. I will therefore use a proxy by assuming that the number of educational units received by immigrant per head of the immigrant population is the same as for the indigenous population: thus I assume that \( C_h/(C_h+C_m) = H_d/(H_d+M_d) \) where \( H_d \) is the indigenous population and \( M_d \) is the New Commonwealth immigrant population in a particular year. We can then write \( O_hQ_h = H_d \cdot (H_d/H_d+M_d) \) and \( \sum Q_h = M_d \cdot OQ_h \). Then by choosing units to set \( OQ_o = 1 \) we can estimate
Figure X

Welfare effects of immigration: Education and Health Services Sector

Immigration reduces the quantity available to the indigenous population from \( Q_h \) to \( Q_h' \).

Utility Loss = \( Q_h' E_1 E_0 Q_h \)

Resource Cost = \( Q_h E_0 BQ_h'' \)
the resource cost $E_0 \frac{Q}{Q_n}$. 

The utility loss $E_1 E_0 \frac{Q}{Q_n}$ can be found by using estimates of the price elasticity of demand. As far as I know, there are no elasticity estimates for health or educational services for United Kingdom. Fortunately though there are some estimates for educational services in Canada: these elasticities are $-0.2$ and $-1.5$ depending on the estimation procedure. I have therefore made use of these.

The results of the calculations are given in Table IV. For example, the figure in the first row, second column, shows the utility loss due to fewer educational units suffered by the 1951 population on the assumption that the immigrants that arrived between 1951-61 actually arrived in 1951; correspondingly the figure in the first row, first column, shows the resource cost that would have been incurred if the government had expanded the services to meet the needs of immigrants. The last column shows estimates of the resource cost incurred to maintain the health services. These figures are a reproduction of those in the first column since the assumptions underlying both calculations are the same. I have no estimates of the utility losses in this sector due to lack of estimates of the price elasticity of demand.

The most striking feature of these figures is that they are much larger than for the transport and housing sectors. Moreover, comparing the results for 1951-61 with those of 1961-66 shows that the extent of

---

1 See S. Ostry (63)
<table>
<thead>
<tr>
<th>Time Period</th>
<th>Educational Services</th>
<th>Health Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Resource Cost</td>
<td>Utility Loss</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$= -1.5$</td>
</tr>
<tr>
<td>1951 to 1961:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumption I</td>
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<td>0.0068</td>
</tr>
<tr>
<td>Assumption II</td>
<td>0.00641</td>
<td>0.00647</td>
</tr>
<tr>
<td>1961 to 1966:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumption I</td>
<td>0.0176</td>
<td>0.0181</td>
</tr>
<tr>
<td>Assumption II</td>
<td>0.0174</td>
<td>0.0179</td>
</tr>
</tbody>
</table>

**TABLE IV**

Welfare effects of immigration:
Educational and Health Services
the loss increases with the size of the immigrant population. This result too contrasts with that for the housing and transport sectors. This shows that owing to government intervention in the market of goods and services, the possibility of an insignificant gain from immigration is turned into a not insignificant loss. The results should be taken cautiously, however, since I have not been able to allow for the relatively younger age structure of the immigrant population\(^1\) and their relatively lower use of the health services\(^2\). Fortunately these two omissions operate in offsetting directions.

One other point should be mentioned regarding all the results for the non-traded sector. The results are obtained by using national rather than regional or local data and correspondingly the welfare effects are expressed as a percentage of the value of national output. Critics may argue that since New Commonwealth immigrants are concentrated in certain regions or towns, the above estimates do not give the true picture of the welfare impact. This criticism may be countered on the grounds that the areas where the immigrants have settled are the industrial conurbations that also account for the major part of the United Kingdom population\(^6\) the use of national data is unlikely to involve any significant errors.

**TRADED-GOODS SECTOR**

As explained on pages 66-7, the analysis adopts the two-commodity

\(^{1}\)A recent report on the subject provides evidence to this effect: it shows that the percentage of New Commonwealth immigrants in the 0-15 age group has always been about 25% higher than that of the total population whereas the percentage in the 15-24 age group has been quite similar to that of the total population. See (31)

\(^{2}\)See (27)
two-country model. I will treat the United Kingdom's agriculture, food, drink and tobacco industries as the import-competing industry and its manufacturing industries (with the exception of food, drink, and tobacco) as the export industry. The 'foreign country' in the model consists of the United Kingdom's major trading partners. Ideally it would be desirable to collect data for all the countries with which the United Kingdom trades. However, as this would have been a very laborious task, I restricted myself to the major sources of the United Kingdom imports and the major markets of the United Kingdom exports: the United Kingdom imported about 70 per cent of its unmanufactured and about 85 per cent of its manufactured food imports (including drink and tobacco) from twelve countries. As for the export sector, I took the OECD countries as the rest of the world.

The estimates of the various elasticities used in my calculations covered the published estimates of Stone and Rowe (56) and the estimates used by M. Miller (34) in the case of the import-competing

---

1 In 1951 the value of United Kingdom imports of food + drink + tobacco amounted to £1,298,900,000 while the exports amounted only to £161,000,000. In 1961 the figures were respectively £1,481,800,000 and £207,300,000, and 1966 they were £1,714,300,000 and £327,200,000. (Figures from different volumes of Annual Abstract of Statistics). As for exports of manufactures, their values were £2,273,200,000, £5,084,560,000 and £4,273,710,000 in 1951, 1961 and 1966 respectively, while the imports of manufactures in the same years amounted only to £884,500,000, £1,400,000,000 and £2,470,700,000, respectively. Figures exclude 'food + drink + tobacco'. Figures are from various volumes of United Nations Yearbook of International Trade Statistics.

2 These countries are Australia, New Zealand, Argentina, Canada, Denmark, Netherlands, Norway, Irish Republic, USA, Spain, Italy and France.

3 The Stone and Rowe estimates are cited in National Institute Economic Review, No.32, May 1965, p.40. Marcus Miller uses a price elasticity of -0.16, and price elasticity of supply for food of 0.32, 0.71 and 0.91. These figures, Miller says, are the figures "implied" in the White Papers of 1970 and 1971.
sector. As for the export sector, my estimates of the price and income elasticities of demand are based on the published estimates by Mrs. Morgan (40), and the estimates of the price elasticity of supply are based on the estimates used by Bela Balassa (4). 

As in the case of the calculations for the non-traded sector, it seemed desirable to see whether the welfare impact was sensitive to the estimates of the price elasticities. Accordingly I have assigned some arbitrary values greater and less than the published estimates. By doing this I obtain $64 \times 4 = 256$ alternative estimates of the welfare impact for the import competing sector and $150 \times 4 = 600$ for the export sector. However, not all these results are relevant for our purpose. Each combination of elasticity estimates (along with the data on tariffs, incomes and production levels) generates a particular ratio of production to consumption: we should be interested in only those combinations of elasticities which generate a production/consumption ratio that is fairly close to the ratios actually prevailing in the United Kingdom. Accordingly I restricted myself to those results that were no more than 2 per cent lower or higher than the actual production/consumption ratios. The results for the import-competing sector are given in Table V, and those for the export sector in Table VI. As for the non-traded sector, I have reported only the highest and the lowest welfare estimates for each case.

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1 Although she gives estimates for both semi-manufactures and finished goods for a number of countries, I have only used estimates for the latter.

2 Balassa also uses some estimates of the price elasticity of demand. He cites R.M. Stern (55) who "assumed demand and supply elasticities of... -0.4 and -0.2 for semi-manufactures, -0.5 and -0.25 for non-durable finished manufactures".

3 In the case of the import-competing sector the proportion of domestic production in the total United Kingdom consumption of the final product—the ratio $O_p/O_Q$—in Figure XII was .70 in 1951, while it was .71 and .75 in 1961 and 1966 respectively. In the case of the export sector the corresponding ratios were .73, .76 and .74 respectively. (These figures are my estimate based on the data in the 'Input Output Tables for the United Kingdom', 'Annual Abstract of Statistics', and the 'Accounts of the Trade and Navigation of the United Kingdom', various issues. In all cases I used the net value output figures.)
<table>
<thead>
<tr>
<th>1951 to 1961</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>NWI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumption I</td>
<td>Highest</td>
<td>-0.00086759</td>
<td>0.0014066</td>
<td>-0.0017852</td>
<td>0.00117</td>
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<tr>
<td></td>
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<td>-0.00057352</td>
<td>0.00079511</td>
<td>-0.00095779</td>
<td>0.00113</td>
</tr>
<tr>
<td>Assumption II</td>
<td>Highest</td>
<td>-0.00058301</td>
<td>0.0012129</td>
<td>-0.0018201</td>
<td>0.000029</td>
</tr>
<tr>
<td></td>
<td>Lowest</td>
<td>-0.00033422</td>
<td>0.00066417</td>
<td>-0.00098698</td>
<td>0.000039</td>
</tr>
<tr>
<td>1961 to 1966</td>
<td>Highest</td>
<td>-0.0042550</td>
<td>0.0036270</td>
<td>-0.0037055</td>
<td>-0.000152</td>
</tr>
<tr>
<td></td>
<td>Lowest</td>
<td>-0.0012877</td>
<td>0.0012133</td>
<td>-0.001353</td>
<td>-0.000031</td>
</tr>
<tr>
<td>Assumption II</td>
<td>Highest</td>
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<td>0.0029635</td>
<td>-0.0012968</td>
<td>0.000106</td>
</tr>
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<td>Lowest</td>
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<td>0.0011147</td>
<td>-0.0013102</td>
<td>0.000108</td>
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</tbody>
</table>

**TABLE V**

**Welfare Effects of Immigration: The Import-Competing Sector**

A1 = the change in the consumer's surplus
A2 = the change in the surplus of United Kingdom raw material producers
A3 = the change in the surplus of value added producers
A4 = the change in the tax and tariff revenues accruing to the indigenous population
NW1 = the net welfare impact of immigration. All figures are expressed as a proportion of the initial year's value of consumption.
The interpretation of the figures is the same as that of the previous tables. Thus the figure in the first row, last column of Table V shows that if the immigrants that came in between 1951-61 had actually come in 1951, the indigenous population of 1951 would at worst have suffered a welfare loss equal to .008 per cent of the value of consumption of the final product in that year. The corresponding figure in the row below shows that at best the indigenous population of 1951 would have enjoyed a welfare increase amounting to about .04 per cent of the value of consumption in that year. This latter result is significant because it shows that, although in the absence of distortions the indigenous population will suffer a loss if immigration causes a price rise, the existence of consumption tax and tariffs may turn this loss into a welfare gain.

Averaging the results for the alternative assumptions we see that the welfare loss suffered by the indigenous population during 1951-61 was about .04 per cent of the value of consumption of the final product while the loss in the period 1961-66 averaged about .24 per cent. The relatively greater loss in the latter period is interesting because it coincides with the higher dependency ratio amongst the immigrants in the latter period.

The results for the export sector are given in Table VI. The interpretation of the figures is similar to that of Table V: the top two figures in the last column show that if the immigrants that came during 1951-61 had actually come in 1951, the indigenous population of that year

1 The values of varied between -0.10 and -0.80, between 0.25 and 1.00 and of between 0.32 and 0.91.

2 The sign of Al in the first column implies a price rise.
<table>
<thead>
<tr>
<th></th>
<th>1951 to 1961</th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A4</td>
<td>NWI</td>
</tr>
<tr>
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<td>0.00031976</td>
<td>-0.0064691</td>
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<td></td>
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<td>-0.0033502</td>
<td>0.00000022</td>
</tr>
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<td>Assumption II</td>
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<td>-0.0033397</td>
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<td>0.00017113</td>
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<td>0.00011</td>
</tr>
<tr>
<td>1961 to 1966</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Assumption I</td>
<td>Highest</td>
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<td>0.0000215</td>
</tr>
</tbody>
</table>

**TABLE VI**

Welfare effects of immigration: the export sector

A1 = the change in the consumer's surplus
A2 = the change in the surplus of United Kingdom raw material producers
A3 = the change in the surplus of value added producers
A4 = the change in the tax revenue accruing to the indigenous population
NWI = the net welfare impact of immigration. All figures are expressed as a proportion of the initial year's production.
would have suffered a welfare loss amounting to at most 0.29 per cent and at least 0.15 per cent of the value of United Kingdom production of the final product. Comparing the averages of the results for the two periods, we see that the welfare loss (as a proportion of the value of output) was slightly higher in the former period. This difference, though not very significant, is in the expected direction: this is because the proportion of dependants in the immigrant community being higher in the latter period, the fall in the export price was lower in that period.

For each of the import-competing and export sector, I also undertook an alternative set of calculations. Using the elasticities underlying the results reported in tables V and VI, I estimated what the welfare impact would have been if the United Kingdom had had no tariffs and taxes. The reason for undertaking these alternative calculations is that, as seen in Chapter IV, the welfare impact may depend on the amount of government revenues that may be distributed to the indigenous population and moreover the tariffs and taxes may affect the absolute price change and hence the changes in the producer and consumer surpluses. Tables VII and VIII give respectively the results of these calculations for the import-competing and export sectors. The most striking feature of these tables is that the figures here are slightly, though consistently, higher than those in tables V and VI. This implies that if there had been no taxes and tariffs, the immigrant-induced welfare loss would have been slightly larger than it actually was.

1 Note that figures relating to period 1961-66 (in tables V and VII, and VI and VIII) are closer to each other than the figures relating to period 1951-61: the increase in the dependency ratio in the immigrant community brings closer the welfare impacts of the hypothetical and the actual situations.
<table>
<thead>
<tr>
<th>Year</th>
<th>( A1 )</th>
<th>( A2 )</th>
<th>( A3 )</th>
<th>( NWL )</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<tr>
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<td>-0.00065565</td>
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<td>-0.00111836</td>
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<td><strong>Assumption II</strong></td>
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</tr>
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<td>Highest</td>
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<td>-0.00121661</td>
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<td><strong>1961 to 1966</strong></td>
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</tr>
<tr>
<td><strong>Assumption I</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Highest</td>
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<td>Highest</td>
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</tr>
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<td>-0.00115255</td>
</tr>
</tbody>
</table>

**TABLE VII**

Welfare effects of immigration: the import-competing sector - hypothetical situation of nil taxes and tariffs*

* For notes see Table V
<table>
<thead>
<tr>
<th></th>
<th>A1</th>
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<tbody>
<tr>
<td>1951 to 1961:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumption I</td>
<td>Highest</td>
<td>0.00032334</td>
<td>0.0031976</td>
<td>-0.0064691</td>
</tr>
<tr>
<td></td>
<td>Lowest</td>
<td>0.00032337</td>
<td>0.0015499</td>
<td>-0.0033502</td>
</tr>
<tr>
<td>Assumption II</td>
<td>Highest</td>
<td>0.00024669</td>
<td>0.0021935</td>
<td>-0.0033397</td>
</tr>
<tr>
<td></td>
<td>Lowest</td>
<td>0.00023521</td>
<td>0.0017413</td>
<td>-0.0026966</td>
</tr>
<tr>
<td>1961 to 1966:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumption I</td>
<td>Highest</td>
<td>0.00016297</td>
<td>0.0040719</td>
<td>-0.0061790</td>
</tr>
<tr>
<td></td>
<td>Lowest</td>
<td>0.00013525</td>
<td>0.0032323</td>
<td>-0.0019833</td>
</tr>
<tr>
<td>Assumption II</td>
<td>Highest</td>
<td>0.00025746</td>
<td>0.0037256</td>
<td>-0.0052180</td>
</tr>
<tr>
<td></td>
<td>Lowest</td>
<td>0.00024867</td>
<td>0.0029555</td>
<td>-0.0011975</td>
</tr>
</tbody>
</table>

**TABLE VIII**

Welfare Effects of Immigration: The export sector - hypothetical situation of nil taxes*

*For notes see Table VII*
So far I have presented the welfare impacts as a percentage of the production (or consumption) in particular sectors. What one needs for an overall judgement, however, is a comparison of the absolute magnitudes involved. This is shown in Table IX. The second and third columns show the average welfare gains (+) or losses (−) pertaining to the sectors shown in column one. The interesting point here is that the welfare impact from the traded sector is much larger than that from the non-traded sector. Taking the net result of the various changes, we find that the welfare loss amounted to £22.4 million per year for the 1951-61 period, while the corresponding loss for the period 1961-66 was £55.2 million. Expressed as a proportion of the total value of net outputs of the sectors examined, the welfare losses are 0.14 per cent and 0.24 per cent for the two periods.

Now it may be argued that the above analysis has not covered all the sectors in which immigration may have had an impact—e.g. immigrant demand for private services may have had some benefits for certain sections of the indigenous population (such as lawyers, taxidrivers) while the restaurants offering Asian and Cypriot cuisine may have provided satisfaction to indigenous consumers. Although this point is acknowledged it may prove not to be very important since the sectors I have been concerned with above accounted throughout the period of study for a very high proportion of the United Kingdom G.N.P. In order to illustrate this I calculate the average welfare losses suffered in these sectors as a proportion of the G.N.P.s.: the losses turn out to be 0.12% for the 1951-61 period and 0.2% for the 1961-66 period. These are only fractionally different from the results given above.

One important point may be emphasised. Although the relatively larger loss in the latter period coincides with the fact that the proportion of dependants in the immigrant community was higher in that period, this result does not necessarily follow from a priori considerations: as the proportion of dependants increased in the latter period, the welfare loss increased in the import-competing sector whereas it decreased in the export sector. In the case of new housing and transport, the net effect is difficult to ascertain—the welfare gain may go up or down as the dependency ratio increases. One cannot therefore conclude that there is a positive relationship between the increase in the dependency ratio and in the welfare loss: the relative sizes of the industries involved and the industrial distribution of immigrants are very important.
<table>
<thead>
<tr>
<th>Sectors</th>
<th>1951 to 1961</th>
<th>1961 to 1966</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Transport</td>
<td>+51,970</td>
<td>+56,473</td>
</tr>
<tr>
<td>New Housing</td>
<td>+ 8,383</td>
<td>14,396</td>
</tr>
<tr>
<td>Educational Services</td>
<td>-2,338,563</td>
<td>-12,355,200</td>
</tr>
<tr>
<td>Educational Services</td>
<td>-(2,321,700)*</td>
<td>-(2,285,000)*</td>
</tr>
<tr>
<td>Public Health Services</td>
<td>-(2,105,880)*</td>
<td>-(9,668,750)*</td>
</tr>
<tr>
<td>Import-competing Sector</td>
<td>-1,763,615</td>
<td>-14,801,848</td>
</tr>
<tr>
<td>Export Sector</td>
<td>-16,230,900</td>
<td>-18,419,489</td>
</tr>
</tbody>
</table>

**TABLE IX**

Welfare effects of immigration: Value of average welfare gain (+) or welfare loss (-)

* value of resource cost incurred by the government
Summary and Conclusions

Our analysis has shown that immigration from New Commonwealth countries during 1951-66 has caused a small loss in welfare for the indigenous population of the United Kingdom. Our procedure was to consider separately the impact in non-traded and traded sectors: in the former case a distinction was made between the industries where the price is determined by market forces and those where the government provide services financed through taxes.

It was found that the welfare loss was largely due to the losses in the traded-goods sector. Moreover, it was found that, although in principle the welfare effect may depend on the rates of consumption taxes or tariffs, the actual welfare effect would not have been very different if the United Kingdom had had a policy of free trade.

A major conclusion of our analysis is that the welfare impact depends very much on the industrial distribution of the immigrant population. Thus, if the number of immigrants employed in the housing and transport services had been smaller than actually was the case, the effect of immigration-induced rise in demand would have been greater and hence the gain in producer surplus for the indigenous population would have been greater. Again if the numbers employed in the import-竞争 sector had been greater than actually was the case, the import prices may have been reduced and indigenous consumers may have gained (and this would have more than offset the resulting fall in producer surplus). Finally, if the employment in the export sector had been smaller, the export prices may have increased and the surplus of indigenous producers would have increased (and this would have more than offset the fall in
consumer surplus). This suggests that further research should examine what factors determine the industrial distribution of the immigrant population.
STATISTICAL APPENDIX
STATISTICAL APPENDIX

This appendix describes the sources of data and methods used to estimate the variables of Appendix tables I and II.

(1) From Annual Abstract of Statistics, various volumes (Note that the 1961 and 1966 figures exclude New Commonwealth immigrants).

(2) The reason for a separate estimate of \( Y_h \) and \( Y_m \) is that the two groups may differ in the industrial distribution of employment and in the dependency and economic activity ratios and that this would be reflected in different per capita incomes for the two groups.

Define the per capita income of the United Kingdom residents in any year as:

\[
(I) \quad Y_{h+m} = \frac{Y_h \cdot M + Y_m \cdot H}{H + M}
\]

where \( H \) = the number of the indigenous population and \( M \) = the number of New Commonwealth immigrant population. \( Y_h \) and \( Y_m \) are respectively their per capita incomes. Now assume that the ratio of per capita incomes of the two groups equals the ratio of their wage earnings. In other words

\[
(Y_m = \frac{Y_h \cdot W_m}{W_h})
\]

where \( W_h \) and \( W_m \) respectively are the average wage earnings of the indigenous and New Commonwealth immigrants workers. Thus we get:

\[
(II) \quad Y_{h+m} = \frac{Y_h \cdot W_m + Y_m \cdot H}{W_h + M}
\]

So if we had data for \( W_m \) and \( W_h \) we could estimate \( Y_h \) and hence \( Y_m \). Unfortunately there are no published estimates of \( W_m \) and \( W_h \).
APPENDIX TABLE I

Per capita income and numbers of the indigenous and immigrant populations

<table>
<thead>
<tr>
<th></th>
<th>1951</th>
<th>1961</th>
<th>1966</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$H_d$</td>
<td>$Y_{h}$</td>
<td>$M_d$</td>
</tr>
<tr>
<td>(1)</td>
<td>$50,225,000$</td>
<td>$253$</td>
<td>$336,600$</td>
</tr>
<tr>
<td>(2)</td>
<td>$52,372,400$</td>
<td>$453$</td>
<td>$924,300$</td>
</tr>
<tr>
<td>(3)</td>
<td>$52,863,700$</td>
<td>$521$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$Y_{m}$</td>
<td></td>
<td>$336,600$</td>
</tr>
<tr>
<td>(4)</td>
<td>$488,844$</td>
<td>$256$</td>
<td>$253$</td>
</tr>
<tr>
<td>(5)</td>
<td>$395,365$</td>
<td>$549$</td>
<td>$453$</td>
</tr>
<tr>
<td>(6)</td>
<td>$499,507$</td>
<td>$549$</td>
<td>$621$</td>
</tr>
<tr>
<td></td>
<td>$M_{s}$ (New Housing)</td>
<td>$5,909$</td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>$5,909$</td>
<td>$5,909$</td>
<td></td>
</tr>
<tr>
<td>(5)</td>
<td>$11,090$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M_{s}$ (Transport)</td>
<td>$2,402$</td>
<td>$30,528$</td>
</tr>
<tr>
<td>(5)</td>
<td>$1,404,604$</td>
<td>$22,402$</td>
<td></td>
</tr>
<tr>
<td>(6)</td>
<td>$1,316,340$</td>
<td>$30,528$</td>
<td></td>
</tr>
<tr>
<td>(7)</td>
<td>$1,187,580$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M_{s}$ (Import-competing sector)</td>
<td>$12,080$</td>
<td>$17,723$</td>
</tr>
<tr>
<td>(6)</td>
<td>$2,017,000$</td>
<td>$12,080$</td>
<td></td>
</tr>
<tr>
<td>(7)</td>
<td>$2,165,187$</td>
<td>$17,723$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$M_{s}$ (Export sector)</td>
<td>$8,540,000$</td>
<td>$109,519$</td>
</tr>
<tr>
<td>(6)</td>
<td>$10,442,025$</td>
<td>$203,719$</td>
<td></td>
</tr>
<tr>
<td>(7)</td>
<td>$12,480,211$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$H_d$ = indigenous population of the United Kingdom
$Y_{h}$ = per capita income of the indigenous population
$M_d$ = the New Commonwealth immigrant population
$Y_{m}$ = per capita income of New Commonwealth immigrants
$H_{s}$ = number of indigenous workers in the industry concerned
$M_{s}$ = number of New Commonwealth immigrant workers in the industry concerned

* = recall that we assume that in the year concerned there were no New Commonwealth immigrants
<table>
<thead>
<tr>
<th></th>
<th>Import-Competing Sector</th>
<th></th>
<th>Export Sector</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$W_d$ (8)</td>
<td>330,356,099</td>
<td>383,635,250</td>
<td>409,676,258</td>
<td>513,698,683</td>
<td>573,124,241</td>
</tr>
<tr>
<td>$y_w$ (9)</td>
<td>£397</td>
<td>£542</td>
<td>£771</td>
<td>£285</td>
<td>£440</td>
</tr>
<tr>
<td>$W_s$ (10)</td>
<td>22,872,695</td>
<td>26,856,301</td>
<td>23,110,810</td>
<td>39,922,218</td>
<td>51,292,718</td>
</tr>
<tr>
<td>V.A. (11)</td>
<td>.3747</td>
<td>.50</td>
<td>.47</td>
<td>.58</td>
<td>.59</td>
</tr>
<tr>
<td>d (12)</td>
<td>.18</td>
<td>-.04</td>
<td>-.17</td>
<td>.006</td>
<td>.0157</td>
</tr>
<tr>
<td>t (13)</td>
<td>.0572</td>
<td>.01</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T (14)</td>
<td></td>
<td></td>
<td></td>
<td>.18</td>
<td>.13</td>
</tr>
<tr>
<td>$R_m$ (15)</td>
<td>.61</td>
<td>.54</td>
<td>.54</td>
<td>.53</td>
<td>.72</td>
</tr>
</tbody>
</table>

**APPENDIX TABLE II**

* For the meaning of symbols see the following page.
Appendix Table II continued

$W_d = \text{population of the 'rest of the world'}$

$W_s = \text{number of people in the 'rest of the world' in the production of the commodity in question. This figure includes employment in the value added stage and in raw material production.}$

$Y_w = \text{per capita income in the 'rest of the world'. (Note that 'rest of the world' means the United Kingdom's major trading partners for the commodity in question.)}$

$V.A. = \text{the share of value added in the final product in the United Kingdom.}$

$d = \text{the United Kingdom's rate of consumption tax expressed as proportion of the producer price.}$

$t = \text{the United Kingdom's rate of import tariff expressed as proportion of c.i.f. import price.}$

$T = \text{the 'rest of the world's' tariff on United Kingdom exports expressed as proportion of United Kingdom export price.}$

$R_m = \text{the share of United Kingdom raw material production in United Kingdom consumption of raw materials (for producing either the import-competing or exportable final product).}$
I therefore estimated these as follows. Assume that in each industry the immigrants earn the same wage rate as the indigenous population. The estimate of $W_h$ is then got by weighting the average wage in each industry by the number of the indigenous population employed in the industry; similarly $W_m$ may be estimated. One other problem concerned the choice of data for those calculations where we assumed that immigrants arrived in the initial year of the period in question. Since there is no data about the industrial distribution of immigrants in 1951, I calculated their income for that year by assuming that their industrial distribution was as at the end of the period in question, i.e. 1961, and using this to obtain the weighted average wage for 1951. Then for consistency for calculations where the 1961-66 immigrants were assumed to arrive in 1961, I used the 1966 industrial distribution of employment and the 1961 wages. (The employment data are from Jones and Smith (28) while the wage data are from 'National Income and Expenditure', various issues). This procedure may be justified because although evidence points to job discrimination against immigrants, there is little evidence of wage discrimination (See, for instance,(52.))

(3) These are the estimates made by E.J.B. Rose (45).

(4) The number of people employed in the new housing sector was estimated from the employment and income data on the construction industry (of which new housing is a sub-division) and the income data on new housing: The United Kingdom employment in the construction industry in 1951 (for which no data was available) was estimated from
the data for England and Wales on the assumption that the proportion of the active population employed in new housing was the same as in the rest of the United Kingdom. Then using this estimate I estimated the numbers of indigenous workers in new housing on the assumption that the ratio of employment in the new housing sector to that in the construction industry was the same as the ratio of net outputs. (The employment figure for construction was obtained from the 1951 Population Census for England and Wales, Table C and Table 4. Income figures were obtained from the 'National Income and Expenditure'. The value of new housing in 1951 was estimated from the 1955 data for new housing and the index of industrial production for the construction industry as a whole - which I obtained from the Annual Abstract of Statistics).

For 1961 and 1966 we have the number of indigenous and New Commonwealth immigrant workers employed in the construction industry in the United Kingdom (see Table I in Chapter I). The numbers in new housing were estimated on the assumption that the ratio of employment in new housing to that in the construction industry as a whole was the same as the ratio of net outputs.

(5) The data on transport is given together with the communications industry. Therefore, to find the number of indigenous and immigrant workers in transport, I made some assumptions. These assumptions and the sources of data are the same as in the new housing examined in note 4 above.
HS = the number of people employed in raw material production (i.e., agriculture) \( (N_r) \) and in food processing \( (N_v) \). To make the 1961 and 1966 figures comparable to that of 1951, the numbers actually employed in 1961 and in 1966 were adjusted upwards to take account of the productivity increase that took place during these years in the particular sector. (The \( N_r \) and \( N_v \) figures for 1951 were obtained respectively from 'ILO Labour Statistics Yearbook, 1956, Table 130' and 'Annual Abstract of Statistics, 1955, Table 130'. The corresponding figures for 1961 and 1966 were obtained respectively from 'Annual Abstract of Statistics' and 'Jones and Smith', op.cit. Appendix Table 3.3. The data for the productivity increase were obtained from 'Statistics on Incomes, Prices, Employment and Production'. The estimates are weighted averages of the productivity increases in agriculture and in manufactured foodstuffs).

As for the export sector, I used the same method of estimation and the same sources of data.

(7) In estimating these figures the use has been made of Appendix Table 3.3 of Jones and Smith's (28) book.

(8) Figures obtained from various values of 'United Nations Statistical Yearbook'.

(9) My own calculation from the figures obtained from various volumes of 'United Nations Statistical Yearbook', and 'Yearbook of National Accounts Statistics'.
(10) Figures obtained from various volumes of 'ILO Labour Statistics
Yearbook', 'United Nations, Growth of World Industry', and
'United Nations Statistical Yearbook'.

(11) The share of the value added, V.A., is expressed as the ratio
'gross domestic incomes (= income from employment + gross profits
and other trading income) of the industries concerned/net total
outputs (= total outputs-inter industry sales) of the industries
concerned'. The figures were obtained from the Input Output
Tables for the years 1954, 1963 and 1968, and I used the estimates
obtained in this way for my calculations of the welfare impact in
1951, 1961 and 1966, respectively.

(12) The rate of tax is the 'taxes on expenditure less subsidies'
figures for the relevant industries expressed as a proportion of
net total input. I obtained these from the Input Output Tables
for the years 1954, 1963, and 1968 - which means that the rate of
tax estimates relate to these years. As there were no other
estimates available, I used them respectively for the years 1951,

(13) The rate of tariff for the import-competing sector as a whole is
got by weighting the tariff of each industry by the value added
of the industry. (The nominal tariff rates were obtained from R.E.
Baldwin (S.) and N. Oulton (42), and the value added figures
from the Input Output Tables).

(14) The 'rest of the world's' tariff on United Kingdom exports is a
weighted average of the tariffs of the United States, the initial six countries of the EEC, Sweden and Japan: the average tariff of each of these countries (for 1962) was obtained from B. Balassa (3), while their G.N.P.s. were used as weights. This rate was used for my calculations of the welfare impact in 1961 and 1966. For the calculations pertaining to 1951 I used a slightly higher tariff rate to allow for tariff reductions in the 1950's.

(15) As far as the import-competing sector is concerned \( R_m = \frac{\text{the value of United Kingdom agricultural production}}{\text{the value of United Kingdom agricultural consumption}} \), where agricultural consumption includes agricultural imports. (The figures for the United Kingdom agricultural production are from various issues of the 'Annual Abstract of Statistics', and the figures for the agricultural imports are from various issues of 'Trade and Navigation Accounts of the United Kingdom' and 'United Nations Yearbook of International Trade Statistics').

In the case of the export sector \( R_m = \frac{\text{value of United Kingdom raw material production}}{\text{value of United Kingdom raw material consumption}} \), where the denominator includes United Kingdom raw material imports. Now, although the data on raw material imports was available (from 'Annual Abstract of Statistics'), there was no data available on the United Kingdom raw material production (used in the production of manufactures). Therefore, in the calculations I used my own estimates of these. To obtain the required figures I followed the following procedure: if we know the value of output, the share of the value added in the value of output, and the value of raw material imports, we also know the value of United Kingdom raw material production.


64. Trenor, C. "Effects produced in receiving countries by mass immigration," The economics of international migration.


