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Globalisation, International Factor Movements and Market Adjustments

by

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Globalisation, International Factor Movements and Market Adjustments

"Globalisation" is a loose and imprecise term. There appears to be two main strands of thought in the literature which discusses it. The first strand is what might be called "internationalisation". By this I shall mean the growing interdependence among national markets for goods, services and factors which has resulted from the liberalisation of trade among nations in goods, services and factors. This focuses on the growth of links between national economies which have resulted from trade liberalisation, including the adjustments required in domestic factor markets.

The second strand is that found in the literature on Foreign Direct Investment (FDI) and the multinational enterprise (MNE). This literature spans economics and management. Economists and management specialists who use the term have in mind something more specific than internationalisation. UNCTAD, which surveys the activities of multinational firms in their annual World Investment Report, uses the term "globalisation" in the more precise sense of integrated production activities and strategies of multinational enterprises. (See in particular the survey in UNCTAD (1993, Part 2) of the "integrated international production system" which is emerging.) This strand highlights the activities of the multinational enterprise as an agent of production; activities such as their integration strategies, intra-firm trade, outsourcing and offshore production.

Both strands have in common a focus on the "global economy" rather than on national economies. This seems to me to be a useful focus in the context of structural adjustment. Most of the existing literature on structural adjustments is concerned with labour market adjustments within national economies. It explores possible sources of change such as globalisation and increased foreign competition, biased technological change, immigration or the disincentive effects of social security schemes (see, for example, the papers in Siebert, 1997)). In comparison, the global economy focus adds two elements to these discussions of market adjustments. First, it emphasises changes in other countries and their relationships to changes in the importing country. Second, a global focus which includes the activities of multinational enterprises encompasses capital and technology markets as well as labour markets.

This paper surveys changes in the global economy and tries to draw out some implications for the analysis of adjustments in national markets. Section I examines major trends in world trade in goods, services, factors and technology. Section II considers some general equilibrium analysis of the liberalising interconnected Global Economy, in particular the question of the substitutability-complementarity of goods trade and factor trade. Section III considers some aspects of the multinational enterprise, including the substitutability-complementarity of goods trade and international production. It also considers the role of the MNE in technology development and diffusion. The final Section, Section IV, notes some implications of the global economy for the analysis of market adjustments at the national level.

I

The most commonly observed trend in world trade is the rapid and sustained growth in the value of international trade in merchandise goods. The WTO (and formerly its predecessor, the GATT) reports annually on the growth of world trade in merchandise, deflating the value series by an index of unit values of traded commodities to obtain an index of the volume of world merchandise trade. In the last decade from 1986 to 1996 the volume of world merchandise trade increased at an average compound rate of 6.0 per cent per annum (WTO (1997b, Table II.1)) This continues a long period of expansion in the volume of world trade since the creation of the GATT in 1948. Moreover, the growth in world trade has been regular. These series show that the volume of goods traded internationally has increased in every year since the recession year of 1982. It grew even during the recession years of the early 1990s, though the rate of growth slowed to about 4 per cent over the period 1990-93.

The WTO also compares the rate of growth in the volume of merchandise trade with that of world merchandise output. In every year since 1986 the volume of world merchandise trade has increased more rapidly then the volume of world merchandise output; at a compound rate of 6.0 per cent compared to 2.5 per cent (WTO (1997b, Table II.1)). This implies that an increasing part of world merchandise output is being traded across national borders. This is the trend of “internationalisation” of world (merchandise) production.

Within the aggregate merchandise trade, there are other trends which are relevant to issues of market adjustment. Consistently in every decade since 1950 the rate of growth of the volume of Manufactures trade has exceeded that of the other two sectors, Agricultural Products and Mining Products; most recently, for example, over the period 1990 to 1996, the volume of manufactures has increased at a compound rate of 6.5 per cent compared to a rate of 4.5 for Agricultural Products and 4.0 per cent for Mining Products (WTO, 1997b, Table II.1). The prices (unit values) of Manufactures have trended upwards without interruption over the last decade whereas the prices of both Agricultural Products and Mining Products have had periods of falling prices and a much higher year-to-year variability. This continues a long-term trend in the fall of the prices of primary products relative to the prices of manufactures. Thus, the growth of world trade has been largely a growth in trade in Manufactures.

The fall in the prices of primary products relative to the prices of manufactures combined with the fall in their share of trade (and expenditures) indicate a shift in aggregate world demand. It is the relative prices which determine the profitability of production and the intersectoral allocation of resources. This shift is more pronounced when the growth of services and trade in services is included.

Breaking down total trade by region, the most notable trend in the last two or three decades has been the increasing share of Asia (including Japan). The Asian share of world merchandise exports rose from 15.6 per cent in 1980 to 25.6 per cent in 1996 (WTO, 1997b, Table III.1). The Asian share of world exports in Manufactures was higher; 28.8 per cent in 1996. The Asian countries in general are highly specialised in Manufactures; in a number of Asian countries (Japan, Hong Kong, Taiwan and Korea) exports of Manufactures make up over 90 per cent of total merchandise exports. This share of Manufactures in total merchandise exports is substantially higher than that of the traditional major industrial regions of Europe (77.8 per cent) and North America (73.8 per cent) in 1996.[1]

1 One may note that the share of commercial services in the combined trade in merchandise and commercial services in the Asian region is 18 per cent in 1996, less than the world average. Hence, the Asian specialisation in Manufactures is even stronger when one looks at the trade in goods and services combined. However, in the 1990s Asia has increased its share of service trade even more rapidly than its share of merchandise trade.

Another trend in the growth of trade and especially trade in Manufactures is the growth of intra-industry trade. Some authors posited that the adjustment problems to changes in trade pattern would be less if the increase in trade was primarily intra-industry rather than inter-industry trade. A number of studies in the Seventies documented the rapid growth of intra-industry trade in the Sixties and Seventies; for example, Grubel and Lloyd (1975, Table 3.1) found that (adjusted) intra-industry trade amounted to 50 per cent of world trade by 1967. In Europe several economists in the late 1980s, however, found evidence that the growing share of intra-industry trade was reversing. A forthcoming study by Brülhart and Elliot (1998) shows that the intra-industry trade share of intra-EU trade increased again in the run-up to the 1992 Single Market deadline. For all merchandise trade it was 64 per cent in 1992.

Much less attention has been paid to international trade in services, though that is now being rectified gradually. In 1996 world exports of commercial services, as measured by the WTO, were 20 per cent of total world trade in merchandise exports plus commercial services. Exports of commercial services have increased over the period 1993 to 1996 at an average annual rate of 7.2 per cent (WTO, 1997b, Table II.5). These exports are in nominal terms as no deflator for trade in services exists. This is about the same rate of increase as merchandise trade over the period. There are no studies of intra-industry trade in services to my knowledge.

With respect to cross-border trade in capital, most of the literature focuses on Foreign Direct Investment (FDI) because, by definition, this is foreign investment which is subject to the control and therefore the decision-making of the multinational corporation. Global FDI inflows increased over the period 1991-96 at an annual growth rate of 17.1 per cent (UNCTAD, 1997, Table 2.1) which was much in excess of the growth of exports of goods and services over the period. Again this is in nominal terms as there is no deflator of asset prices which is suitable and comparable across countries (see UNCTAD, 1997, pp. 23-25 on this point) but this almost certainly indicates a rate of increase in real FDI flows which exceeds that of the volume of trade in goods in services. There has been a boom in FDI flows since the mid-1980s.

To relate these FDI flows to the rest of the economy, it is usual to express them as a percentage of the gross fixed capital formation in the host countries. For the world as whole, this percentage was 5.2 per cent in 1995 (UNCTAD, 1997, Annex Table B.5). For a few countries this figure exceeds 20 per cent (Belgium and Luxembourg, Ireland, and Sweden in the EU, Australia and New Zealand and a number of Developing and transition economies). One cannot, however, interpret this as a corresponding addition to capital formation in these countries as FDI flows are two-way in all countries and the relationship between net borrowing in all forms and domestic savings is complex. One can say that there has been a substantial increase in FDI flows relative to production and capital formation in the world economy. This is the trend of "globalisation".

International movements of labour can, in principle, be treated in the same way as the international movements in capital. There is the added complication that migration flows are divided between migration which is permanent and that which is temporary. Temporary migrants, mainly to Western Europe and the Middle East, outnumber on an annual basis the permanent immigration flows, but most of these return to their home countries after a few years. The main contemporary flows of permanent migration are from the developing countries to the developed countries.

In relation to the total world population and labour force, these flows are very small. Few countries have a migrant share of the population or labour force in excess of 20 per cent. [2] Statistics of the migrant share of population are more readily available than those of the labour force. For the developed countries with large scale permanent immigration programmes, the percentage of the total population which is foreign born are less than 20 percent with the exception of Australia (22 per cent at the time of the 1991 census); for the other countries, the percentages were 6 per cent in the US, 16 per cent in Canada, and 15 per cent in New Zealand (Rod and Williams, 1996, p. 34)). For the other developed countries, the share of migrant labour in the labour force will be much less. In Asia, the Singapore migrant share of total labour force is the highest in the region. Singapore relies heavily on migrants for the supply of some labour markets but in the aggregate just below 20 per cent of its labour force are foreign workers (Chew and Chew, 1995)). Moreover,

2 This is the share of the stock, not the inflow as in the case of capital above. Unfortunately, there are no comparable statistics of capital stocks. The fact that most of the migration stock is temporary labour means that the labour flow statistic is even lower compared to that for the FDI inflow.

this figure is less than the percentage of the FDI inflow as a percentage of gross capital formation in Singapore; over the period 1985-90 the latter figure averaged 59.3 per cent but it was 24.6 per cent in 1995 (UNCTAD, 1997, Annex Table B.5)).

The obvious explanation for the lower international mobility of labour is that every country in the world, with no exception, tightly regulates inflows of labour and people whereas a number of countries have no or little restriction on capital, at least into some sectors and industries, especially manufactures. International flows of capital are generally more important to market adjustments than flows of labour.

Finally, there is a direct relationship between trade in goods and services on the one hand and FDI on the other. Much of the growth of goods trade has been in intra-firm trade. It has been estimated that intra-firm trade constitutes around one third of all merchandise trade (UNCTAD, 1995). By definition, intra-firm trade is between parent corporations and their affiliates or among affiliates of the same parent corporation and is, therefore, related to the growth of FDI. Given the boom in FDI, the share of intra-firm trade has almost certainly been increasing. Similarly, one component of international commercial services is payments across borders of licensing fees and royalties. UNCTAD (1997, p. 20) estimates that these payments quadrupled between 1983 and 1995. Some four fifths of these payments were between parent corporations and their affiliates. These payments are intra-firm service transactions. No estimate has been made to my knowledge of the share of intra-firm trade in world service trade.[3] Hence, FDI and the resultant "globalisation" of production have substantially affected the composition of international trade in goods and services.

II

Issues of international trade and the market adjustments they cause need to be considered from the perspective of the global economy which comprises all of the trading countries.

3 Besides licensing fees and royalties, there are other international service payments which are made by multinational enterprises, many of which are intra-firm transactions; for example, management services and R&D. Data are not available for these services as they are aggregated with other services.

This section considers some of the general equilibrium relationships between trade in goods and services and factors in the global economy.

From the perspective of the general equilibrium of the global economy, international flows of capital and labour may not be independent of trade in produced goods; they may be substitutes or complements for international flows of produced goods. These relationships of substitutability and complementarity may be viewed in terms of the prices or the quantities of the goods and factors traded. In terms of quantity relationships, trade in goods substitutes for (complements) trade in factors if an exogenous increase in the volume of trade produces a decrease (increase) in the volume of factor migration, or *vice versa*. In terms of price relationships, trade in goods substitutes for (complements) trade in factors if a convergence of prices across countries produces a convergence (divergence) of factor prices.[4] For issues of market adjustment, the quantity definition is most relevant. In relation to FDI, these relationships are sometimes expressed as FDI having "trade-replacing" (substitute) or "trade -creating" (complement) effects.

To analyse these relations, one needs to specify the source of the original increase in the quantity of goods traded or the quantity of factor movement. In a general equilibrium model of the global economy, neither the change in the quantity of the goods or the factors can be exogenous. Some parameter in the model must have changed. The analysis is usually based on the effects of opening up trade in goods or in factors from an initial autarky situation to a situation of completely free trade in goods or factors. This causes the initial increase in the volume of trade in goods or factors.

There is a common presumption by many economists and policy-makers that trade in goods and factors are substitutes. For example, one of the factors which persuaded the US Congress to approve the North American Free Trade Area was the belief that increased trade in goods under its umbrella would reduce the demand for Mexican emigration to the US. The same may have applied to the decisions to enlarge the EU with the addition of the associated states and transition economies in East Europe and the

4 The converse is usually presumed to apply, that is, if trade in goods substitutes (complements) trade in factors, trade in factors substitutes (complements) trade in factors. Ethier (1996) shows that there are instances in which this presumption of symmetry does not hold and instances in which goods and factors may be substitutes in the quantity sense but not the price sense or *vice versa*.

Mediterranean. As another example, much of the literature on FDI refers to tariff-jumping FDI, that is, FDI which is induced by the restrictions on trade in goods. The more recent discussion of "investment diversion" due to preferential trading liberalisation is a variant of this view.

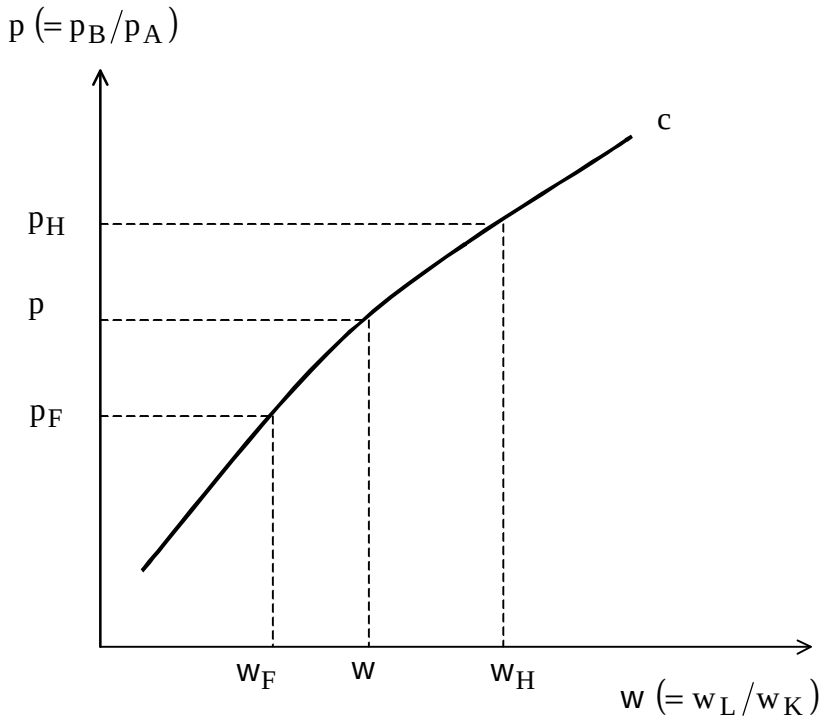
This presumption of substitutability was given support by the seminal paper of Mundell (1957) which showed that trade in goods and factors are perfect substitutes in the Heckscher-Ohlin model. Unrestricted trade in goods leads to factor price equalisation and the elimination of trade in factors and, conversely, unrestricted trade in factors leads to goods price equalisation and the elimination of trade in goods. This result emphasises the general equilibrium effects of factor proportions on factor prices and the one-to-one relationships between goods prices and factor prices.

It can be illustrated by a diagram familiar to international economists. Consider the standard 2×2×2 version of the Heckscher-Ohlin model. The two goods are A and B, the two factors are capital and labour, and the two countries are the Home country and the Foreign country or H and F for short. To isolate the influence of factor endowments and technology, we suppose initially that the two countries are identical in all respects except their relative factor endowments, that is, they have identical technologies and identical preferences. Preferences are homothetic which removes the influence of demand conditions on the pattern of trade.

With only two goods and two factors, there is a function which relates the relative price of goods to the relative price of factors, the price locus. In Figure 1, c is the function which expresses the relationship between the wage rate-capital rental ratio, $w = w_L/w_K$, and the ratio of the price of good B to good A, $p = p_B/p_A$. This holds in both countries because of the assumption that the technologies of the two countries are identical. In this example, this relationship is monotonic; good B is globally labour-intensive so that the goods price ratio is increasing in the factor price ratio.

Suppose first that there is no trade in goods or factors (autarky). The Home country is assumed to be capital-abundant in the physical sense and, therefore, under the assumptions made, also in the price sense. That is, $w_F < w_H$. Consequently, $p_F < p_H$.

Figure 1



Suppose now there is free goods trade between H and F but no factor trade. Each country exports the good which uses intensively the factor with which it is well endowed; Country H exports good A and imports B. The Law of One Price holds in the goods markets. A free trade equilibrium price is established somewhere between the pre-trade price ratios, $p_F < p < p_H$. The Law of One Price holds, that is, $p_{iF} = p_{iH}$ for goods i = 1, 2. Because of the one-to-one relationship between factor prices and goods prices in this 2×2 case, the equalisation of goods prices under free trade leads to the equalisation of factor prices.[5] The factor price equalisation literature has established sufficient and also necessary and sufficient conditions for factor price equalisation. Factor price convergence (that is, partial factor price equalisation) occurs under weaker conditions (see Falvey (1998)).Even if trade in factors were now permitted, there would be no factor trade because the real incomes of factors are equal across countries.

Suppose, instead, that there is free movement of factors but no trade in goods. The real wages of workers are unambiguously higher in the home country than in the foreign country and the real income of capitalists is higher in the foreign country (the Stolper-Samuelson Theorem). Factors migrate in response to differences in real incomes. Labour would migrate from F to H and capital from H to F. Nominal factor prices would be equalised. Factor price equalisation leads to the equalisation of goods prices. Thus trade in goods substitutes for trade in factors and *vice versa*, as Mundell demonstrated.

The Mundell result, however, depends crucially on the assumption that the technologies of the trading countries are identical and on other assumptions which are sufficient for factor price equalisation such as similarity of endowment proportions or the absence of factor intensity reversals. Consider the case in which the countries differ only in terms of technology. Technology differences can be introduced simply by supposing that, in the home country the cost of producing good A fall because of Hicks-neutral technology change in this industry and, in the foreign country the cost of producing good B fall because of Hicks-neutral technology change. The price loci of the two countries are illustrated by Figure 2, taken from Ethier (1996).

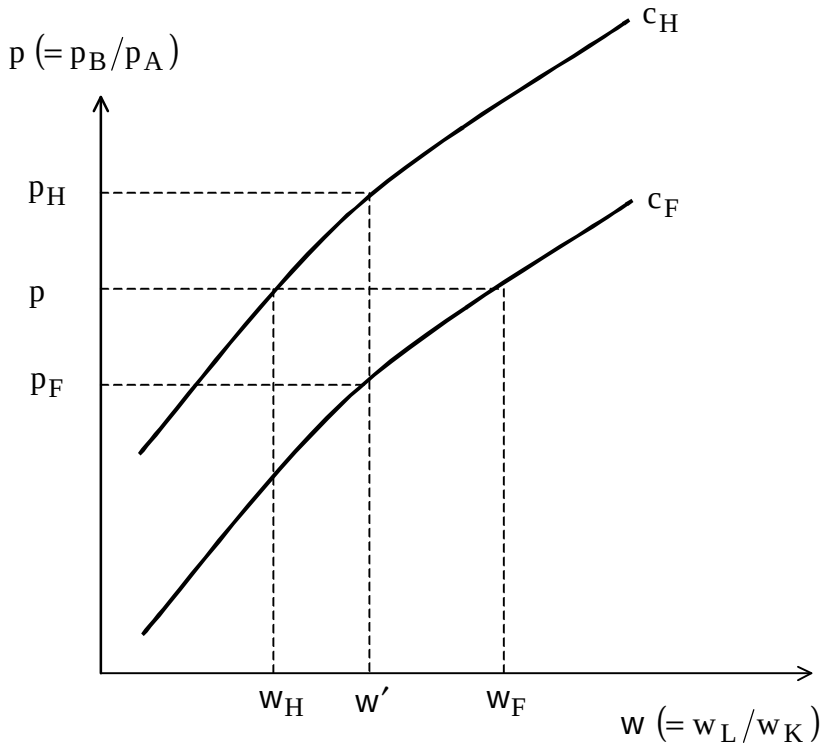
Suppose, first, that there is autarky. To isolate the influence of technology in this case, the two countries are assumed to have the same relative factor price, w'. When trade is opened, the home country exports good A and the foreign country exports good B, as before. The explanation now is that each country exports the good in which it has a superior technology. The relative goods prices converge to p. This causes the price of the factor used intensively in the production of the export good to rise in each country and thus factor prices *diverge* across countries. When international factor movement are allowed, there is inward migration of the factor used intensively in the export industry and outward migration of the other factor; the home country has an in-migration of capital and an out-migration of labour. This increases the volume of trade.[6] (However, the factor

5 These results can be extended to models in which the number of goods exceed the number of factors, as is well-known. But if the number of factors exceeds the number of goods, factor price equalisation does not occur; as, for example, in the specific factor model.

6 The model with factor migration assumes that all migrating factors take on the marginal productivity of the country in which they are employed.

prices are locked into those determined by the goods relative price.) The converse happens when factor migration occurs first with no trade in goods. This increases the volume of exports of the two countries. Thus, goods trade and factor trade are complements and *vice versa*. Production taxes or production distortions which differ across countries produce a similar complementarity (Ethier, 1997).

Figure 2



Note too the importance of the assumption that preferences are identical. If preferences differ among households, real factor price convergence when factors migrate may not produce the convergence of nominal factor prices. Moreover, there may be two way migration of a factor as different households in the one country will have different real incomes at the same goods and factor prices.

Most international economists seem now to believe that trade in goods and factors are more frequently complementary than substitutable, and there is some empirical evidence to support this view in the positive statistical associations of exports and international

production or FDI at the level of firms and nations (Cantwell, 1994, pp. 316-322) and WTO (1996, pp. 53-54).

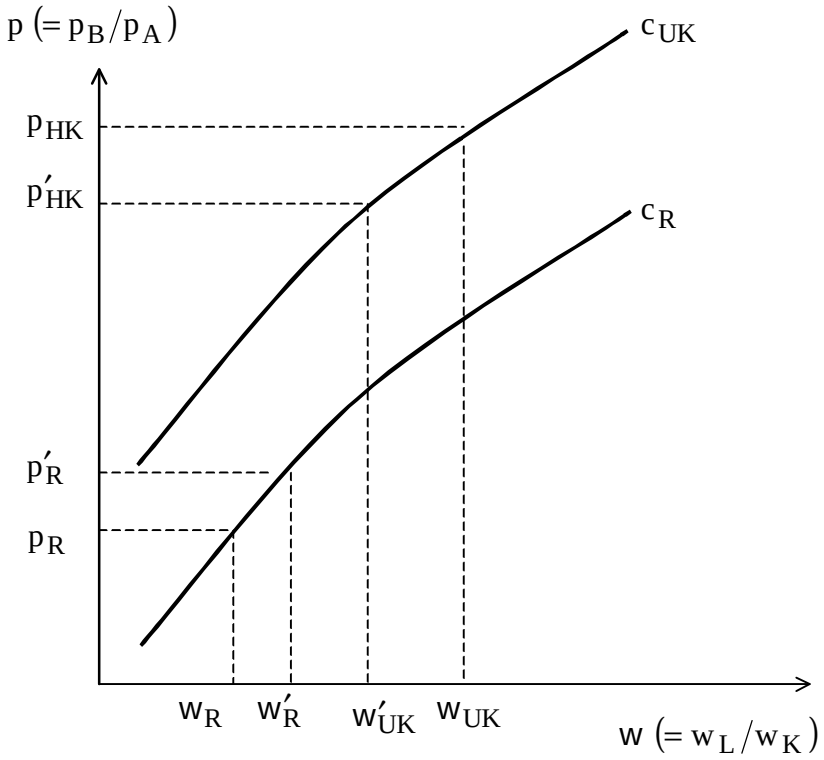
How can this model of interrelated goods and factor trade be applied to a country such as the UK and its current debate about labour market adjustment? One of the foci of the literature is on increased import penetration in goods markets which has been attributed to goods trade liberalisation, at least in part. Certainly, substantial goods trade liberalisation has occurred in the world economy in recent decades through both multilateral, regional and unilateral reductions in barriers to trade in goods. But factor trade liberalisation has also occurred. How have these interacted and what market adjustments have they caused?

Consider the UK as an example. One needs to characterise the factor abundance and level of technology of the UK. As a first pass at the trade pattern of the UK, we can regard the UK as a relatively capital-abundant country (in both the quantity and price senses) and one which also has a technology advantage in the production of capital-intensive goods. It has (net) immigration of labour and (net) emigration of capital (FDI).

This situation may be represented very crudely in Figure 3. Suppose the countries are the UK and the Rest of the World, UK and R for short. In the autarky situation, the UK would have a higher wage rate-rental ratio than the Rest of the World and a superior technology in the capital-intensive good. Some goods trade and some factor trade are now allowed. The partial liberalisation of goods trade will mean that the goods prices converge to say, $p'_{UK} > p'_{R}$. Factor prices also converge in this case: $w'_{UK} < w_{UK}$ and $w'_{R} > w_{R}$ but $w'_{UK} > w'_{R}$. The factor prices cannot converge further because the international flows of labour and capital are constrained by quantity constraints such as immigration quotas and prohibitions on rights of establishment. The partially liberalised factor trade will cause an inflow of labour into the UK and an inflow of capital into the Rest of the World. This will cause the quantities of goods traded to *decrease* compared to the situation with partially liberalised goods trade and no factor trade. In this situation factor trade is a substitute for goods trade, even though technologies differ, because factor trade reduces the disparities in the factor prices between the countries.

This situation is different from that in the previous discussion of complementarity because both initial factor endowments and technology differ between the countries and, in the example, the effect of different endowments dominates. The initial autarky price of labour relative to the price of capital is higher in the UK, which is the country which has the technology advantage in the capital-intensive good. This reveals another complexity of the general equilibrium analysis, namely, that goods and factors may be complements for some initial factor price ratios and substitutes for others in the same model. The initial conditions also matter. (Note, however, that if goods trade is liberalised further in both or even one country the factor price ratios cross and factor trade would cause factor prices to diverge.)

Figure 3



The liberalisation of goods trade causes market adjustments. It contracts the import-competing industry and expands the export industry. In the factor markets, it reduces the real wage rate and increases the real capital rental. Both the in-migration of labour and

the out-migration of capital cause the quantities of goods traded to be less than in the absence of this factor trade.

These models have assumed complete and immediate clearing of factor markets and thereby omit the competition for jobs between new immigrants and the resident labour force because they have allowed real wages to fall to clear labour markets. The immigration of labour exacerbates the adjustments in the labour markets.

III

Given the high rate of growth of FDI noted in Section I and the importance which some economists attach to the activities of the multinational enterprises, we need to consider their role in changing markets. MNEs play a major role in trade and technology transfer.

The recent literature on FDI emphasises that a firm located in one country may supply the markets located in another country or countries by either of two modes of supply (excluding non-equity arrangements such as licensing and franchising). The first is the mode of supply through production in the home country of the commodity and export to the foreign country. The second is by the establishment of an affiliate in the foreign country in which the market is located. The mode of supply through FDI is sometimes called international production. “International production is defined as that production which is located in one country but controlled by a multinational corporation (MNC) based in another country.” (Cantwell, 1994, p. 303). With this terminology the two modes of supply to foreign markets are international trade and international production. One may describe the sum of international trade and international production as “international supply”.

UNCTAD estimates the sales of foreign affiliates worldwide by extrapolating the sales of the foreign affiliates of France, Germany, Italy, Japan and the US on the basis of their share in world outward FDI. These estimates indicate that the sales of foreign affiliates have exceeded world exports or imports of goods and non-factor services in every year since the series began in 1984. For 1994, the latest year available, sales of foreign affiliates were 1.30 times the value of imports of goods and non-factor services (UNCTAD, 1997, Table I.3). These calculations show that one must consider the issue of

import penetration and its role in the adjustments of labour and other markets in terms of international production as well as imports of goods and services.

Foreign affiliates do not sell all of their output in the markets of the country in which they are located. In the latest year in which statistics are available, 1994, the share of exports in the total value of production of foreign affiliates was estimated at 28 per cent (UNCTAD, 1997, Annex Table A.5)). This was actually less than the share in 1982 (31 per cent). This trend may reflect in part at least the fact that FDI is flowing increasingly into the service sector where by definition services that require commercial presence cannot be supplied to third countries. One should note too that the proportion of foreign affiliate production which is exported varies greatly from region to region. In the US it is only 17 per cent in 1994. Thus FDI in the US is aimed overwhelmingly at the US market itself. But in Asia it was 48 per cent and most of this would have gone to third countries; for example, international production from Japanese FDI in East Asian countries is mostly exported to the markets of North America and Europe. FDI has played an important part of the import penetration of these markets by Asian exporters in industries such as electronics.

The pioneering work on the theory of the choice of mode of supply was that of Dunning (1981). His OLI model begins with the assumption that there are inherent disadvantages to FDI because of language and cultural differences. The multinational firm compensates by having some advantage associated with firm-specific knowledge-related capital that can be transferred at zero or little costs to plants in other countries.

In the last decade or so, economists have embedded the activities of the multinational corporation and its choice of mode of supply in general equilibrium models of the global economy (see Ethier, 1994 and Markusen, 1995, for surveys of this theory.) Suppose there are two countries which we can call H and F again, and two industries, A and B. In addition, there are now three types of firms. Type-h and type-f firms are the national firms of country H and F respectively, that is, they produce solely in their home country but they may export to the other country. Type-m firms are multinational firms (MNEs) which operate plants in each country. In one industry there are economies of scale due to the existence of both plant-specific and firm-specific fixed costs and technology

differences between the firms of the two countries. The products of this industry may be homogeneous or differentiated by country.

The international supply of markets through FDI brings additional gains from trade. There are savings in the firm-specific overheads. There may be transfer of technology which lowers the marginal costs of production. There may be gains from greater diversity in the range of products or in product quality.

In the present context, we are mainly concerned with features of the MNE and international production. The structure of firms in terms of these three types is endogenous. Multinational firms emerge when the barriers to exports in the form of border tariffs-NTBs and/or transport costs are substantial but barriers to FDI are relatively low. They do not require differences in factor endowments or preferences. On the contrary, there are higher levels of FDI and international production when the countries have similar per capita incomes and factor endowments. (See Markusen, 1995).

To consider the relationships between international trade and international production further, the key variables need to be defined. For one industry, industry i, in one country, the variables are defined as follows:

X_i^j = exports (supply) to the foreign country by Mode j = 1, 2

M_i^j = imports (supply) to the foreign country by Mode j = 1, 2

S_i = total domestic sales

Y_i = the value of domestic production .

Let Mode 1 be international trade in goods and Mode 2 be international production. X_i^1 and M_i^1 are exports and imports of goods of country i and X_i^2 and M_i^2 are international production by country i's foreign affiliates and the international production in country i by the affiliates of foreign corporations

Trade in goods and in capital (FDI) may be either substitutes or complements in principle. Or, rather, trade in goods and international production may be substitutes or complements. By analogy with the previous definition of substitutability and complementarity between goods and factor trade, trade in goods substitutes

(complements) international production if an exogenous increase in the volume of goods trade produces a decrease (increase) in the volume of international production. For the importing country, this means $\Delta M_i^1 > 0 \Rightarrow \Delta M_i^2 < 0$ (or $\Delta M_i^1 > 0 \Rightarrow \Delta M_i^2 > 0$). For the exporting country, $\Delta X_i^1 > 0 \Rightarrow \Delta X_i^2 < 0$ (or $\Delta X_i^1 > 0 \Rightarrow \Delta X_i^2 > 0$). Presumably, the converse relations hold.

In the Dunning-type model, trade in goods and international production will be substitutes. If restrictions on FDI in the form of denial of rights of establishment or national treatment are reduced, the resultant increase in FDI and international production will substitute for the mode of supply by direct exporting and, conversely, reducing barriers to trade to goods will lead to some substitution of the first mode of supply for the second. Indeed, if barriers to trade were eliminated and transport costs (which constitute another barrier to trade in goods) are zero, international production would disappear. Thus, there would be no multinational enterprises. If barriers to trade were eliminated but transport costs remain significant, there would be both international trade in goods and international production by MNEs.

However, other extensions of the model will produce complementarity between trade in goods and international production. The version of the model described above assumed that all production processes are completely integrated within one county. If the model recognises a sequences of stages of production of one product and allows these to be located in different countries, FDI will be accompanied by the sourcing of inputs from the other country. (Dixit and Grossman, 1982 have a very elegant model of vertical specialisation in the world economy.) This ties in with the popular discussions of FDI and global sourcing of components and other intermediate inputs from the cheapest location in the global economy.

Recently some writers have questioned the underlying premise of the Dunning model that foreign firms have an inherent disadvantage (for example, Gray, 1996)). Multinationality may itself have advantages in some markets. These may be the size and regularity of its long term relationships with key suppliers and customers. Or it may be that knowledge gained from operating and marketing in one foreign country is transferable, to some extent at least, to other foreign markets.

Faster product and process innovation and the transfer of these innovations across national markets is one feature of globalised markets. Multinationality may reduce the costs of innovation. Management specialists talk of "hypercompetition". "Hypercompetition is characterised by constantly escalating rivalry in the form of rapid product innovation, shorter design and product life-cycles, aggressive price- and competence-based competition, and experimentation with new approaches to serving customer needs." (Financial Times, 1998). They cite industries such as IT, pharmaceuticals and automobiles.

One particular aspect of multinationality is the use of strategic alliances with other MNEs in R & D. This is largely a phenomenon of the 1990s (UNCTAD, 1997, chapter 1 and Dunning, 1997). These involve predominantly MNEs from the US, EU or Japan and high technology industries such as biotechnology, information technology and materials development. They are regarded as an important part of the long term strategy of MNEs in these global markets. These advantages of multinationality and the role of R & D and technology development by MNEs suggest possible complementarity between increased international production and increased trade in goods.

Empirical studies are divided on whether trade in goods and FDI (as a proxy for international production) are substitutes or complements. Svensson (1997) finds that for Swedish enterprises international production outside Sweden decreases home country exports. On the other hand, Pfaffermayr (197) finds the opposite in Austria; outward FDI and exports are positively related, that is, they are complements.

As a step in the direction of analysing the links between modes of production, one needs to redefine measures of exports and imports, import penetration, export success and intra-industry trade to take account of the two modes of supply to foreign markets. Let the "exports" and "imports" of the industry be redefined as

$$X_i = X_i^1 + X_i^2 \qquad (1)$$

$$M = M_i^1 + M^2$$

That is, we add exports of goods and international production by MNEs of the same country, and the imports of the gods and the international production of foreign MNEs

located in the country. This gives us the aggregate international supply from and to a country.

One possible objection to the use of these summations is that, for an "importing" country, supply by the mode of a foreign affiliate takes place in the home or importing country and, therefore, employs domestic labour and other factors whereas imports of goods do not. However, foreign affiliates import management and other labour and, conversely, the patent company and affiliates in other countries may import labour from the home country, and both import intermediate and fixed capital inputs. In both modes, the value added in the country in which production is located is less than the gross value of output. What contributes to national incomes in both cases is the value added by residents of the home country.[7]

With these broader definitions of exports and imports, the measures of import penetration and export success can be redefined. The standard measure of import penetration for industry i, and the one which appears in the literature on increased imports as a source of labour market adjustment, is

$$P_i = M_i^1 / S_i \qquad (3)$$

The standard measure of export success is

$$Q_i = X_i^1 / Y_i \qquad (4)$$

These measures relate to exports and imports as a proportion of total domestic sales or output of the industry. When we recognise the existence of two modes of cross-border supply, these measures should be modified to

7 A refinement would be the calculation of "exports" in terms of value added only excluding the import content of the output, and "imports" in terms of "retained imports", excluding that part of imports used in the production of exports. Similarly, the value of the outputs of affiliates of home country corporations producing in foreign countries and of foreign affiliates producing in the home country could be calculated on a value added basis.

The same adjustments could be made in the measures of import penetration and export success and in the intra-industry indexes of Equation (9) and (10).

Julius (1990, chapter 4) suggests a different redefinition of exports and imports of goods on the basis of the nationality of the producer. For exports, this would add goods produced abroad by an affiliate of a parent domiciled in the country and subtract goods produced within the territory by a foreign corporation. The difficulty with this measure is that it ignores the foreign content of goods produced abroad by a domestic

$$P_i = \left(M_i^1 + M_i^2\right) / S_i \quad (5)$$

$$Q_i = \left(X_i^1 + X_i^2\right) / Y_i \quad (6)$$

For the analysis of structural adjustments in some markets, these measures may be preferable to the traditional measures. In the goods markets, one needs to examine competition and market shares from both modes of supply. In capital markets, owners of capital assets used in the production of the outputs of some industry will be concerned with increased penetration by Mode 2 just as much as Mode 1. The rapid growth of FDI indicates that Mode 2 has become a more important source of supply relative to goods trade and, therefore, of import penetration. In labour market, however, the traditional measures may be more relevant.

There are some statistics of the ratio of production by foreign affiliates to imports of goods and services, that is, M_i^1 / M_i^2. In Western Europe, the ratio of sales of foreign affiliates to imports of goods and non-factor services in 1984 was 1.28 (UNCTAD, 1997, Table I.3). The EU figure was 1.22. To compare the shares of the markets located in Western Europe or the EU, one needs to exclude that part of the sales of affiliates of MNEs which are exported to third countries. No data are available for individual countries in Western Europe.

Finally, there may be "imports" and "exports" within the one industry. This can apply to either mode of supply across national borders. For some industries, the import penetration ratio may be less than the export success ratio ($P_i < Q_i$), making them more vulnerable to loss of market share in their export markets than to increased import penetration.

These simultaneous exporting and importing may be captured statistically by an extension of the Grubel-Lloyd measure of intra-industry trade to encompass international supply by the mode of international production. Here one is concerned with the extent to which

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corporation and the domestic content of goods produced at home by a foreign corporation. The value added adjustment would be preferable.

"imports" by Mode 1 and Mode 2 combined are matched by "exports" of Mode 1 and Mode 2 combined. The extended measure of intra-industry trade, for industry i, is

$$IIT_i = (X_i + M_i) - \left| \sum_{j=1,2} X_i^j - \sum_{j=1,2} M_i^j \right| \quad (7)$$

The Grubel-Lloyd measure of intra-industry "trade" in the industry is

$$A_i = \left\{ (X_i + M_i) - \left| \sum_{j=1,2} X_i^j - \sum_{j=1,2} M_i^j \right| \right\} \Big/ (X_i + M_i) \quad (8)$$

The intra-industry trade can be summed across industries, giving an index of the economy-wide level of intra-industry trade.

For the purposes of analysis of adjustments in markets which are shocked by some change in the structure of the market, the index of *marginal* intra-industry trade may be more appropriate. (Brülhart, 1994) proposed an index of marginal intra-industry trade. Brülhart and Elliott (1998, Table 4) calculated the index for intra-EU merchandise trade only. They show that marginal intra-industry trade was some 30 per cent of the change in intra-EU merchandise trade flows over the period 1988-1992. For Manufactures only it was 36 per cent. Brülhart and Hine (1998, p.10) survey correlations between changes in industry employment and the marginal intra-industry trade index. In general they find low and mostly insignificant relationships between changes in imports and exports on the one hand and changes in employment at the industry level. They also find

> "More surprisingly, the evidence suggests that growth in imports relates positively to employment gains. Increased imports do not seem mainly to have crowded out domestic jobs, but they seem to accompany booming sectors, where either intermediate goods are imported to sustain growing domestic production, or the growth in demand is such that it can absorb both higher imports and higher domestic production. Obviously, this conforms with the typical IIT scenario, where both domestic and foreign producers carve out their separate market niches through differentiated products."

On the other hand, other studies find a significant statistical relationship between increases imports into developed market economies from the developing countries on the one hand and changes in employment (Wood, 1994 and Saeger, 1997). The relationship between changes in employment (and other aspects of structural adjustment) and imports may be quite different for imports from different countries.

These differences may be due to differences in the modes of supply. The Brülhart Index covers only Mode 1. The Brülhart index can be redefined in terms of the first differences of "exports" and "imports" . For industry i, this gives

$$B_i = \left\{ \left(\Delta X_i + \Delta M_i\right) - \left| \sum_{j=1,2} \Delta X_i^j - \sum_{j=1,2} \Delta M_i^j \right| \right\} \Big/ \left(\left|\Delta X_i\right| + \left|\Delta M_i\right| \right) \qquad (9)$$

This index measures the extent to which changes in exports and imports by both modes of supply match each other. Like the Grubel-Lloyd Index, this lies in the closed interval [0,1] and, when aggregated across industries, it is a weighted average of the marginal intra-industry trade of the individual industries.

Given the definitions above, one can now decompose marginal intra-industry "trade" in an industry into three components[8]:

1. Two-way marginal exchange of international trade in goods (Mode 1)
2. Two-way exchange of international production (Mode 2)
3. Two-way marginal exchange of international trade for international production (Modes 1 and 2)

Essentially, this approach looks at the market for goods first and measure the offsetting of changes in total exports and imports. Because of the differences between the two modes of supply in their derived demands for labour and for capital across countries, it is desirable to separate the component which is offsetting traditional goods trade and the component which is offsetting international production.

Algebraically, the decomposition of the term in Equation (9) is given by

8 One can also decompose <u>total</u> intra-industry trade into its three components in precisely the same way. This would be appropriate for analysis of total intra-industry trade and international production.

$$(\Delta X_i + \Delta M_i) - \left| \sum_{j=1,2} \Delta X_i^j - \sum_{j=1,2} \Delta M_i^j \right| \equiv 2\min(\Delta X_i, \Delta M_i)$$

$$= 2\sum_{j=1,2} \min\left(\Delta X_i^j, \Delta M_i^j\right) + 2\min(\Delta X_i', \Delta M_i') \qquad (10)$$

where $\Delta X_i' = \Delta X_i - \sum_{j=1,2} \min\left(\Delta X_i^j, \Delta M_i^j\right)$ and $\Delta M_i' = \Delta M_i - \sum_{j=1,2} \min\left(\Delta X_i^j, \Delta M_i^j\right)$. The three terms in equation (10) are the three components of marginal intra-industry trade.

These types can be called Types 1, 2, and 3 respectively. Type 1 is the standard marginal intra-industry trade. Type 2 is the analogous flows for international production by multinational corporations. Type 3 is the mixture of the marginal flows for the two modes, one flow in one direction and the other flow in the reverse direction.

With this decomposition of the marginal industry trade, one can then calculate the proportions of marginal intra-industry trade which are of each type. In particular, one can calculate the proportion of marginal intra-industry trade which has been captured by the measures used hitherto. The three components together give a description of the nature of marginal intra-industry "exports" and "imports" of the industry.

No studies have been conducted of changes in the extended definition of "exports" and "imports" and their relationships to changes in employment or other aspects of structural adjustment in industries. This is a promising area of future research.

The advantage of this formulation with both the MNE and intra-industry trade is that it emphasises the possible links between changes in international trade and international production and between changes in exports and imports, of either mode, within industries. It will be useful for the analysis of structural adjustment problems when marginal intra-industry in trade of any type is important. It is, however, only a beginning. One will need to analyse these measurements in terms of models of intra-industry trade and intra-industry international production.

These concepts have another implication for the analysis of structural adjustment. They focus on the multinational firm as the agent of technology development and diffusion. The

technologies of firms are not regarded as exogenous and unchanging. The development of new technologies, including new products, may be a crucial aspect of competition in global markets. The importance of trade in technologies was noted in Section I. In fact there is considerable concern in EU countries over the competitiveness of EU companies in high-technology industries (see, for example, the papers in Siebert, 1997b). An example of this view of the world is the recent report by the EU Competitiveness Advisory Group (Jacquemin and Pench, 1997)). It sees a need for EU companies to close the worldwide technology gap in order to maintain competitiveness in the EU and export markets. One feature of this literature is the perceived need to maintain a sizable home (EU) base as a platform for exports.

IV

What are the implications of these models for market adjustments?

First, an increase in imports due to liberalisation of goods trade brings gains from increased trade in the importing country. This is the simple lesson of general equilibrium. It applies in the standard model of a small unilaterally liberalising country with no international factor movements. The liberalisation of goods trade contracts the import-competing industry and expands the export industry. This is an expression of Lerner symmetry: “a tax on imports is a tax on exports”. Too much of the literature on labour market adjustment is excessively gloomy and ignores the fact that the problem is an intersectoral adjustment problem. These gains are greater when we take account of the non-Heckscher-Ohlin gains in the form of greater product diversity, economies of scale and technology transfer.

We should note that the increase in import penetration may originate in trade liberalisation in the exporting country too. Given the extent of unilateral liberalisation in some foreign countries, notably in East Asia (see PECC, 1995)), a significant part of the problems in countries such as the UK may be due to foreign trade liberalisation. When international factor movements occur and FDI and goods trade are complementary, the original shock which led to increased import penetration of goods markets may have been liberalisation of FDI in third countries such as Asia.

Second, increased penetration of national goods markets may feed back to factor markets in the goods-importing country. In the factor markets of a capital-abundant country such as the UK, increased import competition in goods markets reduces the real wage rate and increases the real capital rental. When we allow migration of factors between countries, both the in-migration of labour (if not constrained) and probably more importantly the out-migration of capital cause adjustments in addition to those caused by the factor trade. But, in the case outlined in Section II, they cause the quantities of goods traded to be less than in the absence of this factor trade. They moderate the price adjustments required in the importing industry or industries.

This last effect may seem remote from what is happening in the UK markets but in fact it may be substantial. Consider the East Asian countries as an important part in this debate. In the NIC countries (Hong Kong, Singapore, Taiwan and Korea) over a period of the last two decades or so, their relative endowments have changed dramatically. They have become much less labour-abundant. This is partly the result of very high rates of capital accumulation but also of a net capital inflow from Developed market economies. These countries have moved up the technology ladder in terms of the commodity composition of their exports and now compete in more capital-intensive and middle technology exports. (To complicate matters further, three of these countries - Hong Kong, Singapore and Taiwan - have become capital exporters in recent years (see Lloyd, 1996)). But this too is exactly what the Heckscher-Ohlin model with factor migration predicts.)

In those models of FDI which have vertical disintegration of production processes, the effects may be different. FDI may result in increased output of the final product in the FDI-receiving country. Such FDI may in fact be trade-replacing for the final product, international production replacing previous imports of the final product. This poses problems of market adjustment similar to those of the more standard analysis of fully-integrated imports replacing fully-integrated domestic production. But such final products trade may also be associated with an increased sourcing of intermediate and perhaps capital inputs from other countries. In such cases, the changes in the aggregate demand for labour in the industry will be determined by changes in the domestic content of the final product and changes in the volume of output of the industry.

Some of the international trade in goods will be intra-industry trade. This may apply to trade in final products which are differentiated by type or quality and to trade in goods which are a part of a value chain. The latter case allows stages to be ordered by their capital intensity. Then a capital intensive country may produce those stages which require greater capital intensity and import those which require lower capital intensity. There is, however, no reason to believe that offsetting increases in both imports and exports within industries will affect factor market adjustments any differently than the same adjustments caused by offsetting inter-industry increases in exports and imports which occur when markets are opened and international trade increases.

When we recognise the importance of intra-industry trade, we need to recognise that the major shocks to domestic producers may originate in the markets for the goods they export rather than the goods they import. This also applies to international production; firms may be vulnerable to increased competition through the entry of new competitors in their home market or in the markets they serve through foreign affiliates.

With intra-industry goods trade and intra-industry international production, international production may be a substitute or complement for goods trade. FDI and the associated international production may, therefore, moderate or aggravate problems of adjustment due to increased penetration of goods markets.

Models which emphasise the role of technology as a factor which determines market share have the important consequence of highlighting the role which adjustments in technology markets may play in the whole process of adjustment. Technology markets may assist or worsen adjustments in labour and capital markets.

Technology markets may assist the adjustment process. If the shock is in the form of an increase in imports of goods, the appropriate adjustment may be the development within the corporation or by purchase of new technologies to produce new goods or old goods more cheaply. The failure of adjustment which sees the domestic sales and/or the foreign sales of a corporation decline in this event , and with them domestic employment, may be a failure of the firm to adapt its capital stock and technology rather than a failure of labour markets.

On the other hand, advocates of national champions and subsidies to high-technology industries, see a reduction in the home country's producers share of the home country market as a loss of the home base which may threaten the exports of the industry. If this is true, increased import penetration has a secondary negative effect which reduces the demand for labour and other inputs in the industry and increases market adjustments. One must, however, be sceptical of this link.

Hence, the international movement of factors and international production may moderate the adjustment problems in goods markets subject to increased import competition if factor movements and international production are substitutes for goods trade. The standard Heckscher-Ohlin model and the Dunning model of FDI produce relationships of substitutability. But in other models goods and factor movements are complements and factor movements may aggravate adjustment problems in goods market. Similarly, technology trade may moderate the adjustments or it may aggravate them. And the shocks causing market adjustments may originate in factor markets as well as goods markets. In general, therefore, the analysis of market adjustments must include the interplay between factor and goods markets in the home economy.

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