

CHAPTER 10

Globalization in food and agriculture

The preceding chapter focused on the role of trade and trade policies as driving factors for increasingly integrated markets. This chapter on globalization will expand the analysis by identifying the other main factors that drive global economic integration and analyse their main effects on food and agriculture. These are presented in three major sections. The first part provides a definition of the process of globalization, placed in its historical context. Emphasis is given to the importance of factors that reduce transaction costs, notably on the impacts of new transportation and communication technologies. The second section presents the main features of globalization in agriculture, and discusses why some countries have been successful in integrating their food and agricultural economies into the rapidly growing world markets, but also why others have largely failed to do so. This includes factors such as openness to trade and capital flows, ability to adopt external expertise and technologies, but also the importance of factors relating to a country's geographic location or its infrastructure endowment. The third part presents the options, the potential and the limits that developing countries are facing for future integration into global food and agriculture.

10.1 Globalization as an ongoing process

Globalization refers to the ongoing process of rapid global economic integration facilitated by lower transaction costs and lower barriers to movements in capital and goods. It has shown itself in a growing interdependence of the world's economies, rapidly rising trade flows, increases in capital movements and an increasing internationalization of production, often organized within and between multinational corporations. To a large extent, globalization has been brought about by a massive reduction in transaction costs, which in turn was made possible through more efficient transportation and communication facilities as well as innovations in organizing complex logistical processes. Trade and capital flows have also been boosted by a systematic reduction in trade and investment barriers. This process has brought about massive income gains for those who participated. Broadly, the integration into a larger and more competitive market has increased the returns to investment for producers and provided consumers with a greater variety of products at lower prices.

This process of growing integration of the world economy has also given rise to numerous

concerns. Most prominent is the concern about the growing marginalization of entire countries or societal groups within countries. There are in fact many countries that have been left out of the overall economic integration and growth process, in some cases, despite sincere efforts to open up to foreign trade and capital flows. Over the 1990s, rapidly integrating economies recorded a per capita income growth rate of more than 4 percent p.a. while the income available per person in less integrated countries shrank by 1 percent annually (World Bank, 2001e). The rapid growth in agricultural trade has given rise to concerns that diseases and pests will be hard to control and contain at the local level. Moreover, there are sociocultural concerns that globalization could destroy the cultural heritage (including dietary habits) as well as traditional societal and social links that have evolved over centuries. Finally, there is widespread concern about a growing economic, social and cultural dependence on a few dominant countries or corporations, which are seen to have the potential of disempowering entire societies.

While the term “globalization” has been coined only recently, its driving forces and its principal impacts are of older date. Similar developments, albeit of a more limited scope, have characterized global economic development in the past. In particular, innovations that reduce transaction costs (better transportation and communication technologies) have always had a strong accelerating impact on global integration. A look back also suggests that the process of economic integration is a non-continuous one. It is often a process of waves that occur when new technologies are widely adopted around the world. Similarly, trade and investment liberalization is being negotiated and implemented in rounds. The two developments, technological change and liberalization, can be mutually reinforcing and create particularly noticeable waves of globalization. The current wave of globalization is driven by major technological breakthroughs in transportation and communication technologies (notably the Internet, mobile telephone technology and just-in-time systems) in tandem with various efforts to liberalize international trade and investment flows.

The first wave of globalization during the second half of the nineteenth century. The first wave of rapid global integration began in the second half of the nineteenth century and was brought about by a combination of breakthroughs in transportation and communication technologies. Trade between continents was boosted by the shift from sail to steamships, which resulted in a tremendous decline in transatlantic transportation costs as well as faster and more reliable connections. Trade in agricultural commodities, typically bulky, perishable or both, enjoyed a particular boost. Transatlantic trade in grains and oilseeds – previously circumscribed by high transaction costs – shot up sharply. This brought new land into production, most notably in the Midwest United States and some parts of Australia.

Agricultural trade was further accelerated by the advent of the railways, which resulted in a further and sharp reduction of transportation costs within continents. Lower transaction costs heightened competition and brought about not only a significant downward pressure on prices, but also a growing convergence of commodity prices across continents. For example, in 1870, a bushel of wheat sold for 60 cents in Chicago but for double that price in London. The difference was largely a result of high transportation costs from Chicago to London. With railroads and steamships,¹ transport rates between Chicago and London fell to 10 cents a bushel between 1865 and 1900 and the price differentials for wheat declined accordingly (Henderson, Handy and Neff, 1996).

The decline in transaction costs also had significant impacts on the overall volume of intercontinental trade, market shares and income. United States exports of grain and meat to Europe, for instance, increased from US\$68 million in 1870 to US\$226 million in 1880, which boosted farmers’ incomes in the United States and the welfare of consumers in Europe. The new transportation facilities also reduced costs for internal shipments and, together with cheaper food supplies from abroad, increased food security at the local and regional level. For the first time in history, this brought about years of “lower agricultural production without famine” in Europe (Tilly, 1981).

¹ Between 1850 and 1913, global overseas transportation capacity increased by more than 500 percent. At the same time, tankers and vessels with cooling facilities vastly expanded the range of products exchanged within and across countries and continents.

Lower transportation costs also affected labour mobility and labour costs. Sixty million people migrated from Europe to North America and Australia to farm the newly available land. As land was abundant, it created an opportunity for many immigrants to earn an income that exceeded by far the wages they used to earn in Europe. In Europe itself, in turn, it created a relative labour shortage and an upward pressure on wages both in absolute terms and relative to land prices. Overall, immigration led to a narrowing of differences in wages in all globalizing regions. “Emigration is estimated to have raised Irish wages by 32 percent, Italian by 28 percent and Norwegian by 10 percent. Immigration is estimated to have lowered Argentine wages by 22 percent, Australian by 15 percent, Canadian by 16 percent and American by 8 percent” (Lindert and Williamson, 2001). Indeed, migration was probably more important than either trade or capital movements.

The backlash after 1914. With the end of the First World War, trade policy went into reverse and many nations stepped up border protection. The increase in tariffs was built on the notion that higher protection would help rebuild the domestic industries that had suffered or were destroyed during the war. The process started in Europe. France, Germany, Spain, Italy, Yugoslavia, Hungary, Czechoslovakia, Bulgaria, Romania, Belgium and the Netherlands all raised their import tariffs to levels comparable to those before the war. Even the United Kingdom, a free trade nation, declared that “new industries since 1915 would need careful nurturing and protection if foreign competition were not again to reduce Britain to a technological colony”.

In June 1930, when the United States Congress passed the Hawley-Smoot Tariff Act, the United States joined in the new protectionist wave. Agricultural tariffs were increased particularly sharply, both in absolute terms and relative to industrial ones. In reaction to the sharp increase in United States tariffs, other countries enacted retaliatory trade laws. The spiralling tariff increases put a brake on global trade and reversed much of the liberalization that resulted from the first wave of globalization. Between 1929 and 1933, United States imports fell by 30 percent and, more significantly, exports fell by almost 40 percent. The sharp

decline in trade aggravated the internal economic situation, and the depression in the United States intensified and engulfed much of the rest of the then economically integrated world.

The second wave of globalization, 1945-80. The experience gathered from the reversal to protectionist policies during the interwar period gave an impetus to a new wave of internationalism after the Second World War. The new wave of trade liberalization was, however, more selective both in terms of countries participating and products included. By 1980, developed countries’ barriers to trade in manufactured goods had been substantially removed, but barriers for developing countries’ agricultural products had been lowered only for those primary commodities that did not compete with agriculture in the developed countries. By contrast, most developing countries had erected trade barriers against imports from each other and from developed countries.

The resulting effect on trade flows was very uneven. For developed countries, the second wave of globalization was a spectacular success. Freer trade between them greatly expanded the exchange of goods. For the first time, international specialization within manufacturing became important, allowing scale economies to be realized. This helped to drive up the incomes of the developed countries relative to the rest of the world (World Bank, 2001e). For developing countries, it perpetuated the North-South pattern of trade, i.e. the exchange of manufactures for land-intensive primary commodities, and this impeded them in exploiting their comparative advantage in labour-intensive manufactures. In addition, as discussed below, many developing countries adopted a policy approach that was not conducive to a greater integration into the globalizing world economy.

The economic policy approach adopted in many developing countries during the 1950s and 1960s was strongly influenced by the work of Raul Prebisch. Under the assumption of balanced trade and price stability, Prebisch established the following relationship between the relative growth rates of an economy *vis-à-vis* its trade partners and the income elasticities for its exports and imports: $g_i / g_w = e_x / e_m$, where g_i and g_w are the trend growth rates of the economy and the rest of the world, and e_x and e_m the export and import income elasticities.

The policy message from this relationship was straightforward: if a country wants to grow more rapidly than the rest of the world, its export elasticity needs to be higher than its import elasticity. The actual situation in developing countries, however, was precisely the reverse. Typically, they exported primary goods with low income elasticities and imported manufactured products with high income elasticities. As a result, growth without a balance-of-payment constraint was assumed to be impossible without a continuous depreciation of the real exchange rate or the steady accumulation of foreign debt. This so-called “elasticity pessimism” was the main rationale behind the import substitution policies of this period.

For much of the 1950s and 1960s, import-substituting industrialization (ISI) was seen as a way out of this deadlock. ISI was based on the idea that domestic investment and technological capabilities can be spurred on by providing home producers with (temporary) protection against imports. Whether and to what extent ISI helped or hindered development remains controversial. On the one hand, the so-called “consensus view” emphasizes that ISI policies were at the heart of the problems that many of their adopters encountered in the subsequent decades when they opened up their economies (for example, see OECD, 2001c). On the other hand, there are claims (Rodrik, 1997; Hausmann and Rodrik, 2002) that ISI worked reasonably well, notably in raising domestic investment and productivity. It has been stressed that numerous economies in Latin America and the Near East recorded robust growth under ISI policy regimes.

There is, however, a broad consensus that ISI was an ineffective response to weather the economic turbulence of the 1970s, which witnessed the abandonment of the Bretton Woods system of fixed exchange rates, two major oil shocks and other commodity boom-and-bust cycles. For agriculture, ISI strategies meant higher input costs and therefore negative effective protection, i.e. implicit taxation. In conjunction with explicit taxes on output and exports, ISI strategies created a considerable burden for agriculture in many developing countries, put a brake on agricultural export growth and slowed their integration into global agricultural markets. On average, for the period from 1960 to 1984, the bias against agriculture

depressed the domestic terms of trade for agriculture by 30 percent. In the extreme cases of Côte d'Ivoire, Ghana and Zambia, the average bias against agriculture reached levels of 52, 49 and 60 percent, respectively (Schiff and Valdes, 1997).

The current wave of globalization. The last two decades of the twentieth century marked the beginning of a new wave of globalization. Like the first wave about a hundred years earlier, it was brought about by a combination of lower trade barriers and numerous technological innovations that strongly reduced transaction costs for movements not only of goods but also of people and capital. This is particularly apparent from the substantial increase in international migration and capital movements, which were of less importance during the second wave of globalization. Unlike its predecessors, this wave of globalization included many more developing countries, even though not all of them were able to harness globalization to their benefit. Particularly countries in sub-Saharan Africa failed to participate, resulting in a further widening of their income gap with both integrating Asian economies and, even more so, the fully globalized economies of the North.

Most countries in East Asia were able to reap substantial benefits by exploiting their comparative advantage of cheap and abundant labour. Some countries in Latin America and the Near East/North Africa region were also able to integrate fast. A common feature of successful integrators is an above-average shift towards exports of manufactures. Countries such as China, Bangladesh and Sri Lanka already have shares of manufactures in their exports that are above the world average of 81 percent. Others, such as India, Turkey, Morocco and Indonesia are swiftly approaching the world average. Another important change in the exports of successfully globalizing developing countries has been their substantial increase in exports of services. In the early 1980s, commercial services made up 17 percent of the exports of developed countries, but only 9 percent of the exports of developing countries. During the third wave of globalization, the export share of services in the former group increased slightly, to 20 percent, but for developing countries the share almost doubled to 17 percent (World Bank, 2001e).

10.2 The main features of globalization and the correlates of success

10.2.1 Freer trade and outward-oriented policies

Chapter 9 has already dealt with the main developments in global agricultural trade, its importance within overall trade and the structural changes that have taken place over the past 40 years. It also provided an overview of likely trade developments for the next 30 years and the trade policy issues that are expected to arise from the projected shifts in trade flows. In this section, emphasis is placed on the potential role of trade for development and poverty alleviation.

The links between trade, development and poverty have been subject to an extensive and heated debate. While proponents and opponents agree on the central importance of freer trade for increasing global welfare, there is considerable disagreement as to whether and to what extent freer trade can be harnessed by individual countries as a means to promote development and fight poverty. There is also considerable disagreement as to how the transition towards freer trade, i.e. the speed, timing and sequencing of liberalization measures, should evolve. Some of these issues will be addressed in the following section.

The consensus view. Economists have been asserting for a long time that trade liberalization is good for economic development, particularly in developing countries. The benefits from openness are assumed to arise from the efficiency gains that flow from superior resource-allocation decisions in more open markets (Bhagwati and Srinivasan, 1999). The result is an increase in economic growth. More recently there have also been numerous empirical studies that suggest that openness to trade and investment flows has had a positive effect not only on economic growth but also in helping to fight poverty. Among the most influential empirical studies are those by Edwards (1998) and by the World Bank (Dollar and Kraay, 2000, 2001). Wolf (2000) summarizes much of this literature.

In view of its importance for the ongoing policy debate, the main conclusions of the World Bank study are summarized below. The first concerns the

link between growth and openness. Dollar and Kraay examine this relationship using an econometric study covering a sample of 72 developing countries. Avoiding some of the pitfalls of earlier studies by using a single indicator of openness (the ratio of trade to GDP), the authors arrive at a number of important conclusions:

- Weighted for population, the per capita income of the group of “globalizers” grew at 5 percent a year in the 1990s, compared with 1.4 percent for the “non-globalizer” group.
- Growth rates for the globalizers have been steadily increasing since the mid-1970s, while those for the non-globalizers fell sharply in the 1980s and recovered only marginally in the 1990s.
- Per capita income among the globalizers is rising more than twice as fast as in industrialized countries, while the non-globalizers are falling further behind. On a population-weighted basis, countries that are open are growing 3.6 percent a year faster than others. On this basis, average income in a globalizing economy would double every 14 years, compared with 50 years in a non-globalizing economy: a growth gap that would have profound implications for poverty reduction.

The second conclusion concerns the relationship between economic growth and poverty reduction. On the basis of an econometric exercise analysing economic growth in 80 countries over a period of four decades, it is argued that, on average, the income of the poor rises on a one-to-one basis with overall growth. In other words, poor people capture a share of any income increment that reflects their existing share of income distribution. As the authors say: “It is almost always the case that the income of the poor rises during periods of significant growth” (Dollar and Kraay, 2001).

On closer inspection, however, some of the numbers look less impressive. One reason for this is that averages have the effect of obscuring important differences between countries, especially when samples are weighted for population (since this means that large countries such as China have a disproportionate influence). Using an unweighted average, the per capita growth rate for the globalizers in the 1990s falls to 1.5 percent. Moreover, ten of the 24 countries in the group have growth rates

of 1 percent or less. Further disaggregation reveals that one-third of the “globalizing” countries have lower average growth rates for the 1990s than the “non-globalizing” group.

The critique of the consensus view. The basic critique of the consensus view is that the link between openness and growth is one of correlation but not, or at least not necessarily, one of causation. Simply put, openness is essentially an economic outcome, captured (in the case of the World Bank study) by the ratio of trade to GDP, but not an input, i.e. a policy tool to arrive at higher growth.²

When focusing on the causal relationship between trade policy, growth and poverty reduction, the critics of the consensus view claim that it appears to be an upside-down version of reality (Rodrik, 2001 and Oxfam, 2002). In fact, they stress that some of the most successful globalizers are anything but radical liberalizers, while many of the most radical liberalizers have actually achieved very little in terms of economic growth and poverty reduction. They claim that no country has ever developed simply by opening itself up to foreign trade and investment and that practically all of today’s developed countries embarked on their growth behind tariff barriers, and reduced protection only subsequently (Rodrik, 2001).³

There are also many examples in agriculture, where appropriate domestic policy settings and the timing and sequencing of liberalization steps have proved to be more important than a complete and immediate reduction of border protection. Some of today’s most successful agricultural exporters (e.g. China and Viet Nam) established their international competitiveness under protection and import substitution regimes and embarked subsequently on “policy reforms”.⁴ In many cases, success was built on a promotion of export-led growth combined with a domestic investment and institution-building strategy to stimulate entrepreneurship and the willingness to assume risks. Another important factor has been that mechanisms are put in place to ensure

that excess capacities are cut back, and to create exit possibilities for non-performing sectors or actors, and that the opening-up process to international competition is phased in a determined manner (for examples, see below).

Notwithstanding the importance of temporary trade protection measures, the proponents of fast and full liberalization stress that no country has developed successfully by turning its back on international trade and long-term capital flows. Very few countries have grown over long periods of time without experiencing an increase in the share of foreign trade in their national product. In practice, it is hard to imagine that a country can create and sustain growth if it remains shut off from the forces of competition that help to innovate and upgrade its productivity. Moreover, it is equally hard to imagine that developing countries would not benefit from imported capital goods that are likely to be significantly cheaper than those manufactured at home. Policies that restrict imports of capital equipment raise the price of capital goods at home and thereby reduce real investment levels. Exports, in turn, are important since they permit the purchase of imported capital equipment.

The agricultural sector in many developing countries has been particularly adversely affected by the inward-oriented industrial development strategies of the 1950s and 1960s. In some countries the anti-agriculture bias remained a policy feature throughout the 1970s and 1980s (Schiff and Valdes, 1997). Import substitution policies for manufactures restricted capital good imports for agriculture, raised input costs and resulted in often significant negative effective rates of protection. This held back real investment levels in agriculture and slowed export performance in many developing countries. In some developing countries, industrial protection and restrictions on capital good imports for agriculture were accompanied by direct taxation of agricultural exports, placing agriculture at a disadvantage both relative to other sectors and vis-à-vis developed country competitors.

² Dollar and Kraay acknowledge this possibility, when declaring that “we use decade-over-decade changes in the volume of trade as an imperfect proxy for changes in trade policy” (Dollar and Kraay, 2001).

³ Bussolo and Lecomte (1999) also stress that trade policy theory does not unambiguously suggest that protection has a negative impact on growth in developing countries. However, they emphasize that those countries that apply more open trade regimes, together with fiscal discipline and good governance, have enjoyed higher growth rates than those implementing restrictive policies. An open and simple trade policy can foster some external discipline, helping to reduce distortions on domestic markets, and to narrow the scope for wrong or unbalanced policies in other areas, as well as for rent-seeking and corruption that do not normally favour the poor.

⁴ For much of the 1970s and 1980s, developing countries’ agriculture was heavily discriminated against (see Chapter 9). Wherever and as long as agriculture was taxed, either directly or through macroeconomic measures, development slowed and international integration suffered.

Openness and development in agriculture – some country examples. *Viet Nam's* rapid economic and agricultural development over the 1990s is now commonly regarded as one of the most successful development stories of the last decade. Annual GDP growth has been consistently high throughout the 1990s, averaging 7.6 percent. Over the same period, agricultural output has been growing at almost 5 percent per year, far outstripping demand in local markets (Government of Viet Nam, 2001). Poverty has declined substantially and the number of undernourished has dropped by 3 million people (FAO, 2001a).

Export markets provided an important source of demand to sustain growth. Over the 1990s, the value of agricultural exports shot up by a factor of 3.5 and, for a number of commodities such as coffee and rice, Viet Nam emerged as a leading exporter in world markets. By the end of the 1990s, rice and coffee exports combined generated about US\$2 billion in foreign exchange earnings (1997/99 average), accounting for nearly 20 percent of the country's total merchandise exports.

The foundations for Viet Nam's rapid integration into the global market were laid in 1986 with the introduction of *Doi Moi*, Viet Nam's economic renovation programme. At the heart of the reform was a decollectivization process, through which farming families received most of the land. In tandem, farmers were allowed to increase sales to the market and agricultural taxes were reduced. Agriculture also benefited from other fiscal reforms, the creation of a Treasury system, and the reform of the banking system, which created a secure deposit base and allowed fiscal operations deep into the country's rural areas. These measures had a profound effect on society, encouraging entrepreneurship and willingness to take risk. Finally, *Doi Moi* offered "return" options to workers in the new factories, thereby reducing risk for internal migrants and further accelerating the fast development of rural areas.

There is no doubt that the success of the 1990s was also promoted by a growing openness in the global trading environment, in which Viet Nam's export performance benefited from declining tariffs and non-tariff barriers. As in many coun-

tries, Viet Nam's economy also enjoyed all other benefits of globalization, such as cheaper and faster transportation and communications. However, while benefiting from improved market access abroad, Viet Nam was slow in removing its own border protection or its trade-distorting subsidies. Particularly, agricultural import tariffs have been raised repeatedly over the 1990s (see, for example, USDA, 1999c, 1999d and 2001b)⁵ and subsidies have been provided with the aim of increasing agricultural production and exports. Fforde (2002) even maintains that the initial fast liberalization process in the early 1990s did not allow the country to build up enough expertise and competitiveness and put a brake on overall growth.

Policies also played an important role in managing the 2000/02 coffee crisis that severely affected large parts of Viet Nam's thriving agricultural sector. For example, a sizeable support programme was launched to help coffee growers regain international competitiveness. The programme includes subsidies to upgrade coffee quality and to reduce production costs. It promotes smaller, less centralized processing factories and warehouses suitable for the many different coffee-producing regions (USDA, 2001b) and supports the creation of overall and agricultural infrastructure and the shift towards improved coffee varieties. But the new policy package also initiated a rationalization process within Viet Nam's coffee economy. Changes in eligibility for the existing soft loan programme are probably the most important efforts in this context. Under the revised scheme, credit subsidies will not be offered to low-yield producers or inefficient operations, but only to potentially profitable farmers. In parallel, special preferences have been given to participating farmers to switch to arabica coffee or to improve their operation's effectiveness (USDA, 2001b).

Overall there are probably three important features that have contributed to the success of the coffee policy. First, policies play an active role in promoting production, particularly production for exports. Second, support is not an open-ended government commitment but is limited to kick-starting the process and helping the sector discover where its comparative advantage lies. And third,

⁵ Viet Nam undertook, for instance, a far-reaching tariffication exercise in 1999 (effective December 1999), converting many non-tariff barriers into tariffs, in line with World Bank prescriptions. This process was in general accompanied by an increase in effective border protection, with tariff rates between 30 and 100 percent. Detailed tariff schedules are, for instance, available from USDA (1999c, 1999d).

once competitiveness is established, policies focus on the competitive producers and decline support to non-competitive ones. In doing so, competitive producers are helped through the price troughs while the non-competitive ones are encouraged to exit from the sector.⁶

A fairly similar set of reforms in China in the late 1970s set the stage for the impressive economic performance that has been the envy of poor countries since. Per capita GDP (at current prices) increased by a factor of nine and the value of exports by a factor of ten. Agricultural output tripled, as did agricultural exports, while the number of undernourished declined by 76 million people (from 1990/92 to 1997/99). In fact, China was the single largest contributor to the reduction of undernourishment during the 1990s, accounting for two-thirds of the progress made in fighting hunger (FAO, 2001a).

This rapid development process started with fairly simple initial reforms in the agricultural sector. The communal farming system was loosened and the so-called household responsibility system was introduced, allowing farmers to sell their crops on the free market once they had fulfilled their quota obligations to the state. The government remained actively involved in agricultural policy formulation and implementation. The overall process can be best described as one of active experimentation, in which production expanded rapidly under administrative pressure to fulfil production quotas, as well as under production incentives through input subsidies (water, fertilizer).⁷ In tandem, policies were put in place that promoted the adaptation of new technologies from abroad to the domestic production environment (particularly the high-yielding varieties of the green revolution) which, over time, even enabled domestic researchers to take the lead in developing

new applications (hybrid rice, etc.).⁸ The importance of adopting external knowledge and technologies is discussed in Section 10.2.3 below. Finally, domestic policies also encouraged the exit from agriculture of unproductive farmers. These measures include the creation and promotion of township and village enterprises (TVEs) that helped absorb the excess labour of rural areas or, more recently, massive investments in rural infrastructure to reduce transaction costs and increase competitiveness of farmers and food processors in China's hinterland.

Unlike Viet Nam and China, sub-Saharan Africa largely failed to take advantage of the growing trade opportunities in global markets. Its share in global exports, for instance, dropped from 3.1 percent in the mid-1950s to 1.2 percent in 1990. This corresponded to an annual loss in export earnings of about US\$65 billion. In trying to identify the contributing factors to this decline, a World Bank study (Amjadi, Reinke and Yeats, 1996) found that trade barriers abroad have not had a significant influence. On the contrary, once preferences were taken into account, tariffs conveyed significant competitive advantages over competing goods shipped from some other regions, and were even a positive factor for the location of commodity processing in Africa as opposed to some other foreign locations.⁹ Similarly, non-tariff barriers (NTBs) of markets abroad did not account for Africa's poor export performance. In fact, the share of Africa's exports subject to NTBs (11 percent) is less than half the average for the group of developing countries.

To draw general lessons from a few success stories is difficult. Nonetheless, there are a few commonalities that characterize successful globalizers. To begin with, all of them have both outward-oriented policies and domestic produc-

⁶ Viet Nam's active policy engagement in promoting and disciplining production may also be regarded as a special case of policies that have been pursued elsewhere in East Asia. "Where Korea differs from other developing countries in promoting big business, was the discipline the state exercised over these chaebols by penalizing poor performance and rewarding only good ones ... The government as the controller of commercial banks was in a powerful position to punish poorly managed firms by freezing bank credit. As a result only three of the largest 10 chaebols in 1965 – Samsung, Lucky-Goldstar and Ssangyong – remained on the same list 10 years later. Similarly, seven of the largest 10 in 1975 remained on the same list in 1985" (Kim, in Nelson, 2000). The Korean Government was quick to shelve its plans for supporting particular firms or industries when new information suggested that productivity would lag (Westphal, 1981, p. 34).

⁷ It should be noted that the system of incentives to increase or slow output, and even to leave or stay in agriculture, was accompanied by a rigid system of administrative measures that may not be at the disposal of policy-makers in market economies.

⁸ Agricultural policies were accompanied by non-agricultural policy measures that aimed to facilitate structural change and gradually to liberalize the non-agricultural sector. The most important measures were the creation of township and village enterprises (TVEs), the extension of the "market track" into the urban and industrial sectors, and the creation of special economic zones to attract foreign investment.

⁹ The authors warn that Africa may experience some losses through the Uruguay Round erosion of these preferences, although such losses should not be large.

tion incentives. Moreover, freer trade regimes are adopted after or in parallel with domestic policy reforms. The country examples also suggest that openness *per se* is unlikely to be a sufficient condition for a successful integration into the global economy. More important seems to be (i) that farmers can operate in the appropriate domestic incentive system; (ii) that the incentives are reduced where unproductive excess capacity is created and exit policies are in place; and (iii) that adjustment and reallocation costs are minimized, e.g. through appropriate timing, sequencing and pacing of policy measures.

10.2.2 Freer movement of capital and the emergence of transnational companies

Alongside the expansion of trade flows, another feature of globalization has been the rapid growth in international capital flows. Transnational corporations (TNCs) have been the driving force behind this rapid development and foreign direct investment (FDI) is the main instrument through which TNCs expand their reach beyond national boundaries. Through FDI, TNCs affect production levels and composition, production technologies, labour markets and standards, and eventually also trade and consumption patterns. Through their control over resources, access to markets and development

of new technologies, TNCs have the potential to integrate countries into global markets.

Foreign direct investment: level, flows, and distribution. Between 1989/94 and 2000, annual global FDI inflows increased more than sixfold, from US\$200 billion to US\$1 270 billion (UN, 2001c). The growth in FDI exceeded by far the growth in trade flows. Between 1991 and 1995 the average annual growth rate of FDI was 21 percent compared with 9 percent for exports of goods and non-factor services. Between 1996 and 1999, the difference increased, with FDI growing at an average rate of 41 percent and exports growing at 2 percent. In 2000, total sales of foreign affiliates amounted to US\$16 trillion, compared with world exports of goods and non-factor services of US\$7 trillion. Developed countries absorbed the major part (80 percent) of the FDI inflows but also accounted for a similar proportion of outflows.

As an increasing number of countries integrated into the global economy, FDI flows also became more evenly distributed and reached more countries in a substantial manner (UN, 2001c). By 2000, more than 50 countries (24 of which were developing) had accumulated an inward FDI stock of more than US\$10 billion, compared with only 17 countries 15 years earlier (seven of them developing countries). The picture for outward FDI is similar: the

Table 10.1 Regional distribution of FDI inflows and outflows (billion US\$)

	FDI inflows		FDI outflows	
	1989/1994	2000	1989/1994	2000
Developed countries	137.1	1 005.2	203.2	1 046.3
EU	76.6	617.3	105.2	772.9
Japan	1.0	15.8	9.0	32.9
United States	42.5	8.2	49	139.3
Other	17.0	363.9	40.0	101.2
Developing countries	59.6	240.2	24.9	99.5
Africa	4	8.2	0.9	0.7
Latin America and the Caribbean	17.5	86.2	3.7	13.4
Asia	37.9	143.8	20.3	85.3
Other	0.2	2.0	0.0	0.1
Central and Eastern Europe	3.4	25.4	0.1	4.0
World	200.1	1 270.8	228.3	1 149.9

Source: UN (2001c).

number of countries with stocks exceeding US\$10 billion rose from ten to 33 (now including 12 developing countries, compared with eight in 1985) over the same period. In terms of flows, the number of countries receiving an annual average of more than US\$1 billion rose from 17 (six of which were developing countries) in the mid-1980s to 51 (23 of which were developing countries) at the end of the 1990s. In the case of outflows, 33 countries (11 developing countries) invested more than US\$1 billion at the end of the 1990s, compared with 13 countries (only one developing country) in the mid-1980s.

A closer look at the regional distribution, however, reveals that there is still a high concentration of FDI flows within developing Asia (Table 10.1). More than half of all FDI went to Asian economies, and within Asia, East and South Asia accounted for almost the entire inflow. At the other end of the scale, FDI inflows to Africa have remained minimal. While doubling in absolute terms, the continent's share in total inflows to developing countries fell by half, between 1989-94 and 2000, from 6.8 to 3.4 percent (Table 10.1).

TNCs and FDI in food and agriculture. The basis for the large TNCs that dominate today's global food economy was laid with the market concentration process in developed countries. In the United States, for instance, four meat-packing firms have traditionally controlled about two-thirds of the beef supply, and by the mid-1990s over 80 percent of the beef supply was controlled by four firms (OECD, 2001d). High levels of firm concentration also characterize the retail food distribution system in other OECD countries. For example, in Australia, over 75 percent of the retail food distribution system is controlled by three firms.

As the domestic markets for their products became increasingly limited, these large food processors extended their operations in two principal directions. First, they extended their reach "vertically" by taking over the principal operations along the food chain. The final result of this process is often a fully vertically integrated company with operations that cover the entire food chain from the "farmgate to the dinner plate". Second, they expanded horizontally, i.e. they extended their

reach by branching into foreign markets. The combined process of horizontal expansion across countries and vertical integration within the company created the typical TNC in food and agriculture. These TNCs are frequently referred to as "food chain complexes" or "food chain clusters".

The three most advanced food chain clusters are Cargill/Monsanto, ConAgra and Novartis/ADM.¹⁰ ConAgra, for example, one of the three largest flour millers in North America, ranks fourth in corn milling. It produces its own livestock feed and ranks third in cattle feeding, second in slaughtering, third in pork processing and fourth in broiler production. United AgriProducts is part of ConAgra and sells agrochemicals and biotechnology products (seeds) around the world. The conglomerate also owns its own grain trading company (Peavey). At the retail level it widely distributed processed foods through such brands as Armour, Swift and Hunt's, and is second only to Philip Morris as a leading food processor. The Novartis/ADM cluster also connects the different stages of food production from genes/seeds (Novartis and Land O'lakes) to grain collection (ADM) to processing across the globe from Mexico, the Netherlands, France, China and the United Kingdom. Alliances with IBP, the largest United States beef packer and second largest pork packer, extend its influence down the food chain (Heffernan, 1999).

A more recent feature within the process of vertical integration is that the food chain complexes have extended ownership and control from the agricultural downstream sector (food processing and marketing) into strategic parts of the upstream system. For instance, it is estimated that only three firms control over 80 percent of US maize exports and 65 percent of US soybean exports; only four firms control 60 percent of domestic grain handling and 25 percent of compound feed production (Hendrickson and Heffernan, 2002). While market concentration in certain parts of a country's food system is a well-established feature in many countries, these complexes have extended their influence across country borders and have created vertically integrated or coordinated production chains across the globe (OECD, 2001d).

¹⁰ All of them are located in, and operate globally from, the United States. They control, through joint ventures and strategic alliances, important parts of the food industry that range from seeds to processed products such as meats, seafood and other foods (OECD, 2001d).

Table 10.2 shows the implantation of agrofood TNC subsidiaries from different home regions of the parent company arranged by host region of the subsidiary, i.e. how much and where TNCs have spread out their activities. It shows that most TNCs in the food industry operate from a western European or United States home base. Together they account for about 84 percent of all TNCs that have invested in markets abroad. Those from Asia are largely found in Asia, although there are significant numbers located in the EU and North America, and those from Latin America are predominantly in other Latin American countries. Europe and North America are both the home and the hosts to the vast majority of TNC subsidiaries, their stage of development acting both as push and pull forces. TNCs from the EU and the United States have, to a significant extent, also established foreign affiliates in developing countries. In both cases, Asia and Latin America are the most important destinations. TNCs from western Europe, for instance, have nearly as many foreign affiliates in Asia or Latin America as they have in North America. By contrast, Africa is home to very few subsidiaries, and those it has are almost entirely located within other African countries.

TNCs in food and agriculture: help or hurdle for rural development? The general view among experts – in developed and developing countries alike – is that FDI is a powerful catalyst for overall economic development. A number of recent publications (World Bank, 2001e and UN, 1999b) have documented the benefits that FDI can create for development. The 1999 issue of the *World Investment Report* (UN, 1999b) identifies five major advantages that are carried along to the host country alongside inflows of FDI: access to capital,¹¹ access to technology, access to markets, enhanced skills and management techniques and help to protect the environment

The UN report stresses that developing countries have vastly benefited from the rapid increase in FDI inflows during the 1990s, particularly through added productivity growth. Several other sources underline and quantify the potential that TNCs have in generating productivity gains (e.g. Sachs and Warner, 1995; Baily and Gersbach, 1995).¹² Baily and Gersbach (1995) stress that the potential for productivity gains is particularly large where TNCs reinvest profits in the host countries, create forward and backward linkages with local firms, upgrade the performance of a country's firms

Table 10.2 Number of subsidiaries of the 100 largest TNCs by region (1996)

Home region	Host region						Total
	Africa	Latin America and the Caribbean	North America	Asia	Eastern and central Europe	Western Europe	
Africa	58	0	0	1	3	2	64
Latin America	8	45	14	5	0	49	121
North America	52	390	1 295	234	114	818	2 903
Asia	9	37	103	587	1	90	827
Western Europe	84	233	312	268	104	1 948	2 949
Australasia	1	8	5	25	0	46	85
Total	212	713	1 729	1 120	222	2 953	6 949

Source: Agrodata (2000).

¹¹ The catalyst for the East Asian financial crisis in 1996 was a huge outflow of funds, as commercial banks and institutional investors called in loans. The resulting losses were equivalent to more than 10 percent of GDP for some countries (based on data in IMF, 1999). By contrast, FDI remained constant throughout this period.

¹² This is partly because of increased competition, partly a demonstration effect "...when companies based in one country set up operations in another, they carry with them the production processes and productivity levels of their home country" (Baily and Gersbach, 1995, p. 309).

through the provision of superior expertise and technologies and hence boost growth (Box 10.1). Also to be remembered is that TNCs are the world's chief repository of economically useful skills and knowledge and that technology flows are increasingly important components of FDI (UN, 1999b).

Despite the vast potential of FDI for rural development, there are a number of reasons to suggest that simply opening up a country's border to FDI may not be the best way to reap the benefits. There are substantial differences in the "quality" of FDI flows and governments may have to intervene in the process of channelling FDI. Furthermore, the complexity of the FDI package means that governments face trade-offs between different benefits and objectives. For instance, they may have to choose between investments that offer short- as opposed to long-term benefits; the former may lead to static gains, but not necessarily to dynamic ones. Moreover, the level of FDI inflows to developing countries can easily be overstated. TNCs can repatriate much of the profits that they produce from their investments in developing countries. In sub-Saharan Africa, for instance, an average of 75 percent of the profits have been repatriated annually between 1991 and 1997 (IMF, 1999). Also the costs of attracting FDI through tax revenues foregone in the host country can be substantial¹³—costs that need to be counted against the benefits these inflows bring.

There are also concerns that TNCs abuse their market power, add downward pressure on rural

wages and disempower farmers through unfair contractual arrangements. These concerns often arise from the notion that the linkages between farmers and TNCs are based on contracts between unequal parties, one party consisting of a mass of unorganized small-scale farmers with little bargaining power and few of the resources needed to raise productivity and compete commercially, and the other party being a powerful agribusiness, offering production and supply contracts which – in exchange for inputs and technical advice – allow it to exploit cheap labour and transfer most risks to the primary producers. This imbalance in negotiating power has been described extensively for the international cocoa and coffee markets where smallholder farmers are at the starting-point of "buyer-driven supply chains" (e.g. Ponte, 2001; see also Box 10.2). Such an imbalance in negotiating power can affect the distribution of benefits along the food chain (Talbot, 1997; see also Ponte, 2001; Gibbon, 2000; and Gereffi, 1994). For example, the share of income retained by coffee producers dropped from 20 percent in the 1970s to 13 percent in the 1990s and is likely to have dropped further with the dramatic price decline for green coffee in 2001/02.

But it should also be noted that there have been important domestic factors that have squeezed the profit margins for producers. Some developing countries have creamed off farmers' profits through export taxes, export controls and mandatory sales. For instance, for much of the 1970s and early 1980s

Box 10.1 TNCs can be the source of major productivity gains

Baily and Gersbach (1995) carried out a comparison of labour productivity in Japan, Germany and the United States for a number of manufacturing sectors, including food and beer. The United States was most productive in both of these sectors, food productivity in Germany reaching 76 percent of the United States level while in Japan it was only 33 percent. For beer the comparable figures were Germany 44 percent, and Japan 69 percent. They relate relative productivity to a globalization index and find a significant positive relationship – high globalization leads to high relative productivity. The globalization index is a complex construct that takes into account the extent of the exposure of a country's firms in a particular industry to the productivity leader's firms, through trade, production by the productivity leader's subsidiaries in the country, or ownership. For food, the globalization index is very low in Japan, but at a medium level in Germany, and rising.

The authors conclude that the entrance of foreign firms is the most significant impetus to productivity upgrading in an industry and that the indirect effects (on local firms and the supply chain) may be more significant than the direct effects.

¹³ For example, in the second half of the 1990s, the governments of Rio Grande do Sul and Bahia in Brazil gave General Motors and Ford financial packages worth US\$3 billion to locate factories in their states (Hanson, 2001).

Box 10.2 The global coffee chain: changing market structures and power

The 1990s saw a number of major changes in the structure of the international coffee market. The main changes include a growing market concentration of trading and roasting companies; a growing product differentiation in high- and low-quality brands; and a redistribution of the value added along the marketing and processing chain.

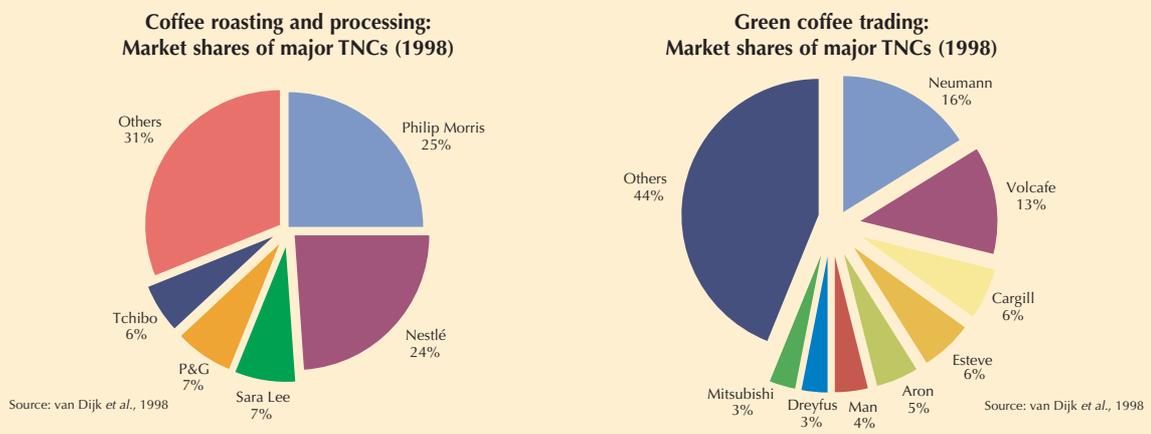
Growing market concentration. The general deregulation of the international coffee market that followed the end of the International Coffee Agreement (ICA) in 1989 opened the way for a growing consolidation of the market. This process was particularly pronounced for roasting and trading, where a declining number of companies control an increasing part of the market. In 1998, the two largest coffee traders (Neumann and Volcafé) accounted for 29 percent of the total market, and the top six companies controlled 50 percent (Figure 10.1). Amid growing market concentration, some smaller and specialized companies have emerged, focusing on trade in the speciality coffee market (high-quality and specific origins).

Concentration within the group of coffee traders was promoted by higher international price volatility, which increased after the end of the ICA (Gilbert, 1995). Mid-sized traders with unhedged positions suffered considerable losses or found themselves too small to compete with larger traders. As a result, they either went bankrupt, merged with others, or were taken over by the majors. Within the exporting countries, the bureaucracy that was needed to monitor exports and ensure compliance with the quota restrictions of the ICA was no longer needed. Coffee boards and other parastatals that regulated export sales have been dismantled, the capability of producing countries to control exports disappeared and their ability to build up stocks decreased. Despite very low prices, current producer-held stocks are close to their lowest levels in 30 years.

Product differentiation. Despite the overall increase in market concentration there was a product differentiation into a system of first-line and second-line supply, subject to price premia and discounts. The differentiation was created by roasters who declined shipments from countries that could not guarantee a reliable minimum amount of supply. In the case of arabica, this minimum is around 60 000 tonnes a year (Raikes and Gibbon, 2000). Minimum supply requirements have created concerns that minor producers may become increasingly marginalized in the future. In addition, product segmentation will further encourage international traders to engage in major producing markets such as Uganda in order to satisfy their major roaster clients (Ponte, 2001).

Redistribution of the value added. Increased consolidation in the coffee industry has also affected the distribution of total income generated along the coffee chain. Talbot (1997) estimates that in the 1970s an average of 20 percent of total income was retained by producers, while the average proportion retained in consuming countries was almost 53 percent. Between 1980/81 and 1988/89, producers still controlled almost 20 percent of total income, while 55 percent was retained in consuming countries. In the 1990s, the situation changed dramatically. Between 1989/90 and 1994/95, the proportion of total income gained by producers dropped to 13 percent, and the proportion retained in consuming countries surged to 78 percent. The share of income retained by producers in the last three to four years is likely to have dropped further as a result of the current situation of oversupply and low prices for green coffee and the ability of roasters to maintain retail prices at relatively stable levels.

Figure 10.1 Market concentration in the coffee chain



cocoa farmers in Ghana were obliged to sell their crop to the government for as little as a twentieth of the world price (The Economist, 2002a, p. 44). Likewise, profit margins have also been squeezed for Ecuador's banana growers, largely in the absence of TNC activities. Ecuador's government has currently fixed the local price for bananas at US\$2.90 per box, whereas the export price is as high as US\$17 per box. The low farmgate price "has squeezed farmers' profits to almost nothing" (The Economist, 2002b, p. 54). Unlike Central America, where TNCs own almost all banana plantations, Ecuador's banana economy is dominated by some 6 000 small family farm producers.

Some experience with successful FDI in food and agriculture. The links created between TNCs and domestic firms are crucial factors that determine whether and to what extent a host country benefits from FDI. In the food industry, these linkages are forged between the TNC and the farmers or the local procurement company. The potential for linkage-intensive FDI is particularly substantial in food and agriculture. Linkage-intensive FDI is often the result of the need to process perishable inputs such as milk or fruit and vegetables (UN, 2001c). It can also be forced by logistical bottlenecks or by tariff barriers that make imported goods less competitive. Moreover, TNCs may face restrictions on landownership in many developing countries which can make it necessary for foreign affiliates to rely on domestic producers and to engage in efforts to develop new and upgrade existing suppliers.

These linkages from the foreign affiliate to the national farm sector can provide enormous benefits for farmers and their cooperatives and thus have considerable potential to stimulate rural development. Field research conducted in India (UN, 2001c) provides a number of interesting insights as to how these benefits are generated. It reveals that the four leading TNCs (i.e. Pepsi Foods Ltd, GlaxoSmithKline Beecham Ltd, Nestlé India Ltd and Cadbury India Ltd) on average sourced locally 93 percent of their raw material (tomatoes, potatoes, basmati rice, groundnuts, cocoa, fresh milk, sugar, wheat flour, etc.) and 74 percent of other inputs (such as plastic crates, glass bottles, refrigerators, ice chests, corrugated boxes, craft paper, etc.). Through these linkages the TNCs promoted overall development by means of the

following methods.

- *Collaboration in product development.* All four TNCs are engaged in product development with local research institutes or universities, to develop hybrid varieties of crops and vegetables and new agricultural implements, to alter cropping patterns and to raise productivity. For example, Pepsi Foods has evaluated more than 215 varieties/hybrids of chili, probably the largest scientific evaluation of chilies anywhere. Pepsi's technology in chili cultivation has raised its yield three times. In addition, Pepsi has developed 15 new agricultural implements to facilitate planting and harvesting in India.
- *Technology transfer and training.* New hybrid varieties, implements and practices have been transferred to suppliers (primarily farmers) through farmer training camps. Pepsi provides its contract farmers, free of charge, with various agricultural implements and hybrid seeds/plantlets, as well as process expertise. Cadbury India has a procurement and extension services team that imparts training to potential and existing suppliers in new techniques in planting, harvesting, quality control and post-transplantation care of cocoa crops through technical bulletins, video demonstrations, slides and charts and live demonstrations on the use of various agricultural implements.
- *Introduction of contract farming.* Farmers are contracted to plant the processors' crops on their lands and to deliver to the processors, at pre-agreed prices and quantities of output based upon anticipated yields and contracted area. Towards this end, a processor usually provides the farmers with selected inputs such as seeds/seedlings, information on agricultural practices, regular inspection of the crop and advisory services on crops. Farmers have the choice to leave some part of the output free from the contract arrangement to sell on the open market (see also Box 10.3).
- *Financial assistance* is provided to growers through the involvement of agricultural development banks. For example, GlaxoSmithKlineBeecham acts as a guarantor, enabling its suppliers to take bank loans.

Technology transfer to local farmers has had a positive impact on farm productivity. Tomato

Box 10.3 Formalizing the linkages in agriculture: the importance of contract farming

An extensive study by FAO (FAO, 2001i) brings together numerous examples from many developing countries that confirm the generally positive influence of TNCs on the agriculture of these countries. But the FAO study also shows that policies play an important role in promoting the benefits that TNCs or the local processors can provide for a country's agriculture. Most important, it shows that the underlying contracts between farmers and the company are crucial for success or failure. Numerous examples demonstrate how well-managed contract farming works as an effective tool to link the small-farm sector to sources of extension, mechanization, seeds, fertilizer and credit, and to guaranteed and profitable markets for produce. When efficiently organized and managed, contract farming reduces risk and uncertainty for both parties. The principal benefits laid out in the study are the following.

Increased productivity. In northern India, Hindustan Lever, a food processor, issued contracts to 400 farmers to grow hybrid tomatoes for processing. A study of the project confirmed that production yields and farmers' incomes increased as a result of the use of hybrid seeds and the availability of an assured market. An analysis of the yields and incomes of the contracted farmers compared with farmers who grew tomatoes for the open market showed that yields of the farmers under contract were 64 percent higher than those outside the project. In Sri Lanka, a flourishing export trade in gherkins has been built on contracts between companies and more than 15 000 growers with plots of around 0.5 ha each. On a much larger scale, more than 200 000 farmers in Thailand grow sugar cane for the country's 46 mills under a government-sponsored system that assigns growers 70 percent and millers 30 percent of total net revenue (FAO, 2001i).

Introduction of superior technologies. Small-scale farmers are frequently reluctant to adopt new technologies because of the possible risks and costs involved. In contract farming, private agribusiness will usually offer technology more effectively than government agricultural extension services, because it has a direct economic interest in improving farmers' production. Indeed, most of the larger corporations prefer to provide their own extension. In Kenya, for example, the South Nyanza Sugar Company (SONY) places strong emphasis on field extension services to its 1 800 contracted farmers, at a ratio of one field officer to 65 sugar-cane growers. The extension staff's prime responsibilities are focused on the managerial skills required when new techniques are introduced to SONY's farmers. These include transplanting, spacing, fertilizer application, cultivation and harvesting practices. Also, SONY promotes farmer training programmes and organizes field days to demonstrate the latest sugar-cane production methods to farmers.

Risks and problems. In addition, the FAO study emphasizes that contract farming can be a major tool for transferring skills and providing access to credit – features that are particularly important for smallholders. But the study also underlines that certain risks and problems can be associated with contract farming. Considerable problems can result if farmers perceive that the company is unwilling to share any of the risk, even if it is partly responsible for the losses. In Thailand, a company that contracted farmers to rear chickens charged a levy on farmers' incomes in order to offset the possibility of a high chicken mortality rate. This was much resented by the farmers, as they believed that the poor quality of the chicks supplied by the company was one cause of the problem. Inefficient management can lead to overproduction, and in some cases processors may be tempted to manipulate quality standards in order to reduce purchases. One of the biggest risks for farmers is debt caused by production problems, poor technical advice, significant changes in market conditions, or a processor's failure to honour contracts.

yields of local suppliers for Pepsi in Punjab, for example, rose from 16 tonnes/ha in 1989 to 52 tonnes/ha by 1999. In general, foreign affiliates may have contributed to better farming practices (e.g. hybrid seeds, transportation innovation) resulting in increased incomes and yields (McKinsey & Company, 1997).

10.2.3 International flows of knowledge and technological innovations

Probably the single most important transfer of external technology to developing countries' agriculture took place during the green revolution. The literature documents where the new technologies have been adopted, to what extent, and how

swiftly this has been the case. This section will focus on why some countries managed to adopt, exploit and further enhance the new technologies, while others failed to do so. It will try to identify the policies that allowed some countries to embrace global technological innovations, but also describe why other countries are still struggling to adopt the technologies that developed country farmers have been using for many decades.

One of the most influential studies in this context (Griliches, 1957) underlines the importance of inventive adaptation. Griliches shows that farmers in Iowa and Illinois had long adopted high-yielding hybrid maize varieties suited to the Corn Belt states, while farmers outside the Corn Belt (e.g. in Alabama) continued to grow inferior traditional varieties. This had little to do with the farmers' capabilities. Instead, differences in the agro-ecological conditions between the Corn Belt and Alabama, together with the sensitivity of hybrid maize to these differences, resulted in the lack of adoption and the continuous technological distance between these maize-growing areas. As Griliches noted, "farmers outside the Corn Belt could not reap the benefits of the new technologies until the adaptive research had taken place to make the technologies available to the new environment".

In general, the same holds for the transfer of new technologies to developing countries. Farmers in the Philippines got no direct benefit from many decades of United States hybrid maize research that produced a tripling of United States maize yields. They indirectly benefited from previous hybrid research in the United States only after the research capacity was created to adapt the hybrid varieties to local conditions in the Philippines. In many African countries, farmers are still cut off from the benefits of hybrid maize varieties, not because they are unwilling to import the technology but simply because the technology has not been adapted to their local growing environments.

Perhaps even more important, much of the success of the green revolution was not or not primarily based on the fact that new technologies were made available to countries from outside.

While the new "foreign" technologies, i.e. high-yielding varieties, played an important role, there is ample evidence that the superiority of these new varieties was largely limited to the areas to which these new technologies were adapted. Evenson and Westphal (1994) documented how important the adaptation process to tropical environments was for the success of high-yielding rice varieties outside their subtropical homes.¹⁴ "It was in the 1950s, after an Indica-Japonica crossing programme sponsored by the FAO and IRRI gave major impetus to rice improvement for tropical conditions, that the new technologies became available where they were needed. By 1965, many national rice breeding programs had been established in tropical conditions. India, for example had 23 programs in various locations. Around 200 rice breeding programs existed in some 40 countries by 1970. Most had, and have maintained, a close association with IRRI, which has served as a nodal point in the transfer of new germplasm."

Evenson and Gollin (1994) quantified the importance of adaptive research in the spread of high-yielding rice varieties during the green revolution. They show that national research centres played a crucial role in the adoption and spread of the new "technology". The International Rice Research Institute (IRRI), as the central and exogenous provider of the new technology, accounted for only 17 percent of all new varietal releases since 1965. IRRI played, however, a crucial role in generating the basic technology: it accounted for 65 percent of all new releases of parental varieties.

In the future, the very same factors will likely determine the extent to which the new agrobiotechnologies will be adapted and diffused to the economic and agro-ecological environments of developing countries, even though the issue is complicated by the fact that many of the new technologies are proprietary ones. Countries that put in place the basic infrastructure that promotes the adaptation to local environments are likely to gain the most. Again, Asian countries are likely to come first, followed by Latin America, while there is a danger that African countries will, once again, be left behind.

¹⁴ Evenson and Westphal also provide an extensive documentation of the events that kick-started the spread of high-yielding rice varieties in the 1950s. *Inter alia*, they explain that: "The earliest rice improvement research activities were in Japan, where major gains were made in this century through improving Japonica landraces suited to subtropical regions. It was not until World War II that concerted efforts were made to improve the Indica landraces. As of that time, rice producers in Japan, Korea, Taiwan and parts of mainland China had achieved a 50-year technological lead over the tropical rice producing areas".

The factors that determine the success in reaping the benefits of new technologies have much in common with those that enable countries to reap the benefits of open markets. The experience of the green revolution suggests that the existence of new productivity-enhancing technologies alone is not a guarantor for a successful adaptation of these technologies. Likewise, opening up to international markets and reduction of border measures will not, on their own, ensure that the potential of freer trade can be fully exploited. Both openness to trade and to technological change are important, but what seem to be more important are the policies and institutions that allow countries to exploit the opportunities offered by openness. These factors can help to acquire the often tacit knowledge that enables countries to adapt new technologies to the domestic market environment, help them to exploit the demand potential of large international markets and employ trading rules to their advantage. Taken alone, access to markets is unlikely to create an exportable surplus. If not locally adapted, new technologies will not substantially increase productivity.

10.2.4 Greater mobility of people within and across national borders: migration and urbanization

International migration. Massive movements of labour have been a feature of all three waves of globalization. During the first great wave of modern globalization, from 1870 to 1910, about 10 percent of the world's population relocated permanently (World Bank, 2001e). International migration was much more modest and geographically limited during the second wave. The main reason was that only a limited number of countries were involved in the second wave of globalization, and where intense migration pressures occurred, strict immigration controls helped to put a brake on labour flows. These controls were somewhat relaxed during the third wave of globalization and had a powerful effect on transnational migration. By 1995, about 150 million people or 2.3 percent of the world's population lived in foreign countries (Taylor, 2000). Roughly half of this stock of migrants was in the industrial countries and half in the developing world. However, because the population of developing countries is about five times

greater than the population of the developed countries, migrants account for a much larger share of the population in developed countries (about 6 percent) than in poor countries (about 1 percent).

The freer movement of people has always had powerful effects on wages in poor and rich countries alike. Initially, different speeds of growth within and across countries promote inequality in wages and wealth, which in turn creates the economic pressure to migrate. Then migration itself, in addition to increased trade and capital flows, helps arrest or even reverse a growing wage inequality. The influx of low-wage labour puts downward pressure on wages in immigrant regions, while raising wages in the emigrant nations. Moreover, wealth is also redistributed when and to the extent that emigrants send back remittances to their countries of origin. As already mentioned in Section 10.1, Lindert and Williamson (2001) conclude that migration was overall a more important equalizing factor than either trade or capital movements.

Globalization also affects international migration in agriculture. During the first wave of globalization, migration was almost exclusively determined by different speeds of agricultural development. But even today many developed countries turn to foreign-born migrants as an important source of agricultural labour. Most rural migrants are attracted by higher wages in developed countries' fruit, vegetable and horticultural sectors. In the United States, for example, an estimated 69 percent of the 1996 seasonal agricultural workforce was foreign-born (Mines, Gabbard and Steirman, 1997). In California, by far the nation's largest agricultural producer, more than 90 percent of the seasonal agricultural workforce was foreign (Taylor, 2000). The majority (65 percent) of United States migrant farm workers originated from households in rural Mexico. Despite the high concentration of foreign-born workers in farm jobs, the vast majority of immigrants are employed outside agriculture, most in low-skill service and manufacturing jobs.

Agricultural migration is primarily a movement of low-skill labour from developing countries to the higher wage environments of developed countries. As such, it is unlikely to be associated with many of the typical concerns that emigration would lead to a "brain drain" in developing countries and

deprive them of their most important capital for future development. In fact, empirical studies show that migrants seldom sever their ties with their source households after they migrate and family members who remain behind (often parents and siblings) reorganize both their consumption and production activities in response to the migrant's departure. Migrants (often children) typically share part of their earnings with their household of origin through remittances (Taylor, 2000). Remittances or savings accumulated abroad can even create the basis for future investments in the rural economies of their home countries.

The impacts in the countries of immigration are often more ambiguous. While an inflow of unskilled workers from developing countries benefits the highly skilled workers in host countries (their jobs are not threatened by these immigrants, and the presence of immigrants will lower prices for many things that the skilled workers consume, including food, restaurant and hotel services, and personal services), the same inflow will reduce the real wages of unskilled workers. Such competition in the low-wage sector has brought about political tensions within many host countries and has often resulted in increasingly restrictive immigration rules.

As immigration rules tightened and the economic incentives to immigrate remained unabated, illegal immigration and trafficking in human beings increased rapidly. The World Bank estimates that there is an annual inflow of about 300 000 illegal workers to the United States alone (World Bank, 2001e). Many more cross temporarily into the United States. In 1999 United States authorities apprehended 1.5 million illegal immigrants along the Mexican border. The great majority sent back to Mexico attempt to cross again within 24 hours. Illegal migration into the EU soared in the 1990s, from an estimated 50 000 p.a. in 1993 to half a million in 1999 (World Bank, 2001e).

Intranational migration and urbanization. As discussed in the preceding section, international migration has affected rural populations and agricultural labour forces in developed and developing countries alike. However, despite its importance for certain regions or countries (notably North America), international migration has become

negligible compared with migration within national boundaries.

A look at the United Nations population projections by urban and rural areas reveals that a significant proportion of the world's population growth expected between 2000 and 2030 will be concentrated in urban areas. Urban population was estimated at about 2.9 billion in 2000, and is projected to be about 4.9 billion by 2030 (Figure 10.2). Most of the future increase will be in the cities of developing countries. The urban population in developing countries is projected to increase from 1.9 billion people in 2000 to about 3.9 billion people by 2030, thus accounting for almost the entire increment in developing countries' population growth. But only a part of it is caused by increased rural-urban migration. Also important will be the transformation of rural settlements into urban areas and, most important, natural urban population growth.

These shifts in population distribution are considerable. At the beginning of the 1960s, only about 20 percent of the developing countries' population lived in urban areas. By 2000 the share had risen to nearly 40 percent and is expected to rise to 56 percent by 2030. The rural-urban population ratio declined from about 3:1 in the 1960s to almost 3:2 in 2000 and will be close to 3:4 in 2030. Within the group of developing regions, urbanization will be most pronounced in developing Asia and sub-Saharan Africa. In other developing regions, notably Latin America, urbanization has already progressed to an extent that leaves little room for further growth in urban populations, at least relative to rural ones.

Numerous factors have promoted and will continue to promote urbanization in developing countries. These factors are often classified as push and pull factors, i.e. factors that either incite people to leave their rural homes or attract them to urban areas. Typical push factors include low and declining profitability of agricultural production, lack of non-agricultural employment opportunities and a general lack of services such as schools, medical treatment and entertainment. They have resulted from a general neglect of, or even an outright bias against, agriculture.

On the pull side, expectations for better services, housing, higher wages and more reliable sources of food are the main factors that attract

migrants to urban areas. The typical drivers of globalization, notably better information facilities (television, etc.) have been instrumental in creating these expectations. There is, however, a large and widening gap between the expectations and the realities of urban areas in developing countries. Access to food, jobs and services is becoming more limited and other amenities that are often associated with “urbane” or “civilized” city life are entirely missing. This so-called premature urbanization is associated with numerous externalities. These include huge social costs caused by health and sanitation problems, urban poverty, crime, etc.

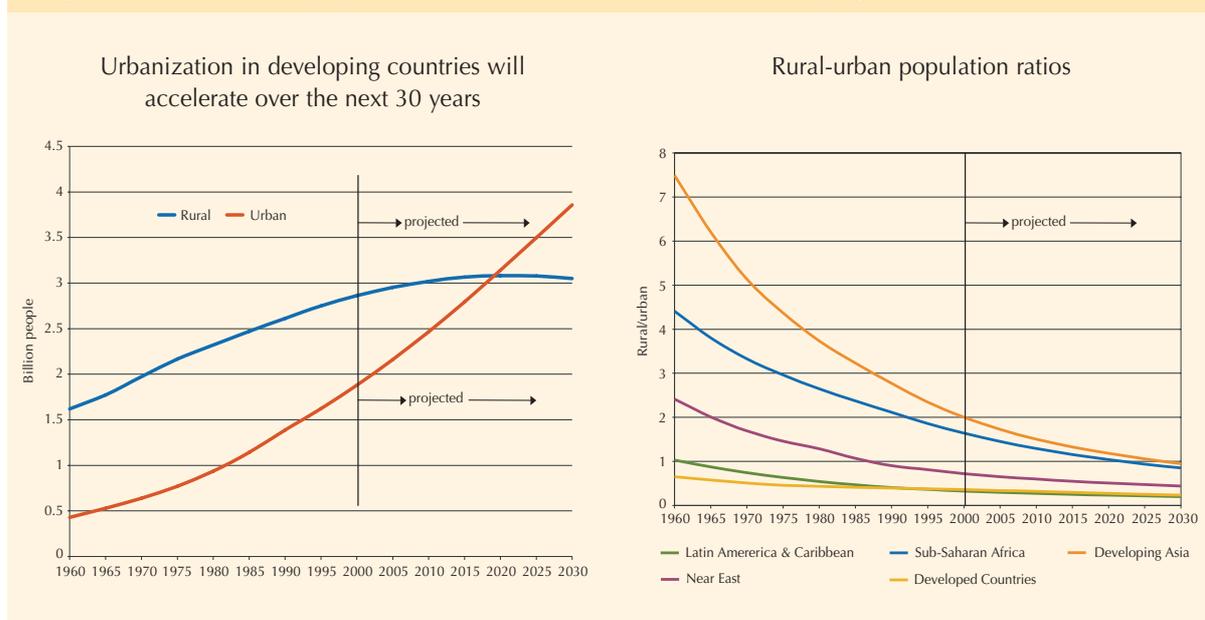
Despite these problems, it is widely accepted that urbanization is unstoppable, let alone reversible (The Economist, 2002c). Moreover, while it may not even be economically desirable to stop or reverse urbanization, it can be very profitable to slow the trend and mitigate or avoid the externalities associated with premature urbanization. The most important factor is a revival of rural areas in developing countries, which would amount to a reversal of the internal and external policy bias against agriculture in developing countries (as discussed in Chapter 8).

10.2.5 How important are geographic location and infrastructure?

Geographic location. Economists have long noted the crucial role of geographic location for economic development. Adam Smith, who is most remembered for his prescription of free market forces for economic development, emphasized that the physical geography of a region can influence crucially its economic performance (Smith, 1976). He contended that the economies of coastal regions, with their easy access to sea trade, usually outperform the economies of inland areas. Smith's rationale for the importance of geographic location is that productivity gains depend on specialization, and that specialization depends on the size of the market. The size of the market in turn depends on both the openness of markets and the costs of transport. Geography is a crucial factor in determining transport costs.

Empirical studies based on geographic information systems (GIS) have drawn renewed attention to the importance of the physical location for economic development. A frequent point of departure for the GIS-based analyses of location-based development questions is a map of income density,

Figure 10.2 Past and projected trends in urbanization of developing countries



a measure of how much GDP is produced within a given area of land.¹⁵

Figure 10.3 provides such a map. The map underlines two principal geographic factors that affect economic well-being. First, almost all high-income countries are in the mid- and high latitudes, while nearly all countries in the geographic tropics are poor. Second, coastal economies have generally higher incomes than landlocked countries and coastal, temperate, northern hemisphere economies have the highest economic densities in the world. Indeed, outside Europe, there is not a single high-income landlocked country, although there are 29 non-European landlocked countries (Gallup, Sachs and Mellinger, 1999). Four areas – western Europe, Northeast Asia (coastal China, Japan and the Republic of Korea), and the eastern and western seaboard of the United States and Canada – are the core economic zones of the modern world. These regions are the overwhelming providers of capital goods in global trade, the world's financial centres, and the generators of a large proportion of global production.

A look at the regions within the United States, western Europe and temperate-zone East Asia that lie within 100 km of the coastline reveals that these areas account for a mere 3 percent of the world's inhabited land area, 13 percent of the world's population and at least 32 percent of the world's GDP measured at purchasing power parity. If coastal China is excluded from the calculations (since it lags far behind the other economies in this group), then the core coastal region has a mere 9 percent of the world's population but produces at least 30 percent of world GDP. According to WTO data (1995), just 11 countries in North America, western Europe and East Asia, with 14 percent of the world's population, account for 88 percent of global exports of capital goods (machinery and transport equipment).

Moreover, nearly all landlocked countries in the world are poor, except for a few in western and central Europe that are deeply integrated into the regional European market and connected by low-cost trade. Even mountainous Switzerland

has the vast bulk of its population in the low-elevation cantons north of the Alps, and these population centres are easily accessible to the North Atlantic by land and river-based traffic. There are 35 landlocked countries in the world with a population greater than 1 million, of which 29 are outside western and central Europe. The difference in the average GDP per capita is striking: the landlocked countries outside western and central Europe have an average income of about US\$1 771, compared with the non-European coastal countries, which have an average income of US\$5 567. The difference in economic density is even greater, since the landlocked countries tend to be very sparsely populated¹⁶ (Gallup, Sachs and Mellinger, 1999).

The most important points that arise from the inspection of GIS-based information can be summarized as follows:

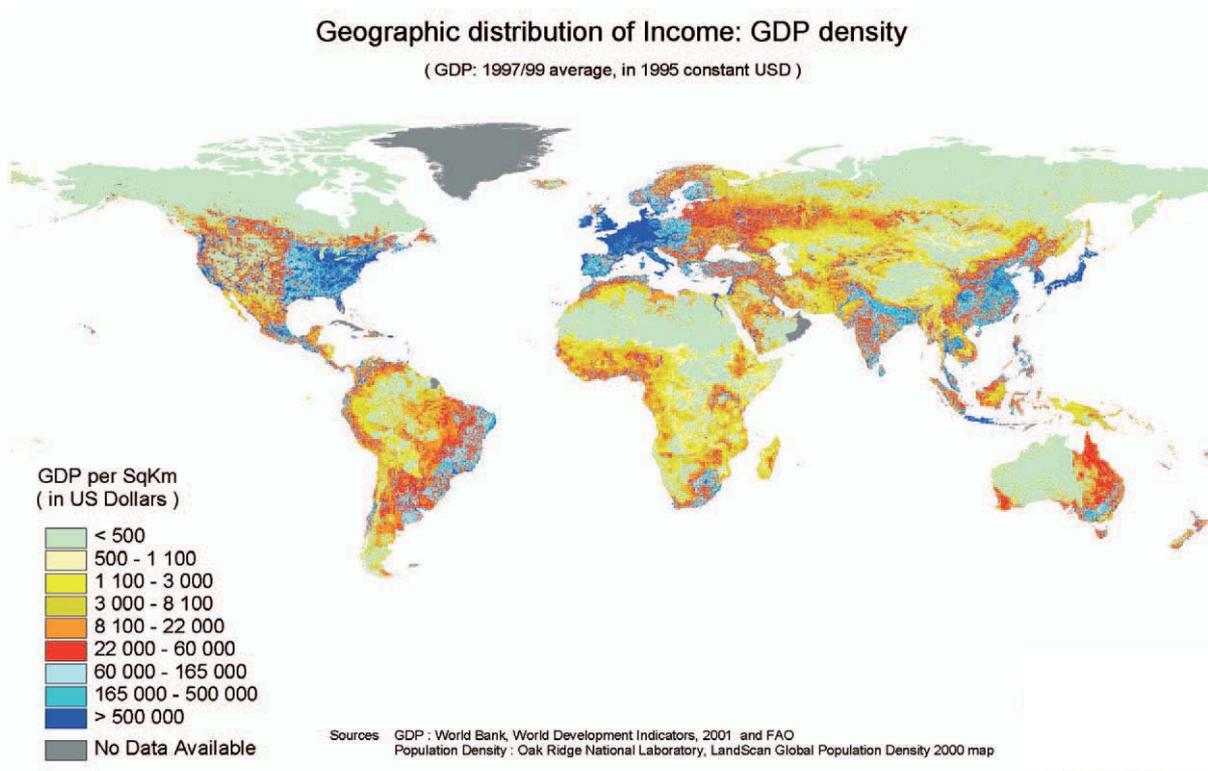
- Coastal regions, and regions linked to coasts by ocean-navigable waterways, are strongly favoured in development relative to the hinterlands.
- Landlocked economies may be particularly disadvantaged by their lack of access to the sea, even when they are no farther than the interior parts of coastal economies.¹⁷
- Location advantages are particularly important for successful economic integration of agriculture and the food industry. Many agricultural commodities are either bulky, perishable or both, which leads to high transportation costs per unit value of product. High transportation costs mean that countries with poor market access conditions and inadequate infrastructure might remain effectively insulated, even if all trade barriers were removed.

Endowment with, and importance of, infrastructure. Infrastructure can offset much of the disadvantage that may arise from an unfavourable geographic location. In fact, in many developed countries and regions, access to infrastructure offsets possible disadvantages caused by unfavourable locations. The extensive and efficient transporta-

¹⁵ Ideally, such an income density map depicts information about population density and the spatial distribution of income. In the absence of the latter, Figure 10.3 simply combines population density with average per capita income levels (1997/99) for a given country.

¹⁶ Fifty-nine people per km² in landlocked countries compared with 207 people per km² in coastal countries.

¹⁷ Obvious reasons for this are: cross-border migration of labour is more difficult than internal migration; infrastructure development across national borders is much more difficult to arrange than similar investments within a country; and coastal economies may have military or economic incentives to impose costs on interior landlocked economies.

Figure 10.3 GDP density map of the world

tion and communication systems in landlocked parts of Europe or North America effectively link these regions to one another and integrate them into world markets. A look across other regions of the world provides a more mixed picture. While parts of East Asia and Latin America hold relatively high stocks of infrastructure, Africa and many countries in sub-Saharan Africa in particular suffer from both unfavourable location and a lack of infrastructure.

The case of sub-Saharan Africa. Numerous studies (e.g. Finger and Yeats, 1976; Amjadi, Reinke and Yeats, 1996) have analysed and quantified the importance of infrastructure as a factor for the successful integration into international markets. Amjadi, Reinke and Yeats focus on sub-Saharan Africa and how the region's inadequate endowment with infrastructure weighs on its export performance. The study also documents the importance of insufficient infrastructure and related policies relative to other factors such as tariffs and non-tariff barriers.

The importance of the region's infrastructure relative to its competitors is also underlined by a comparison of the barriers that sub-Saharan African

exporters face in markets abroad, relative to those its competitors faced when they embarked on export-oriented policies. For example, pre-Uruguay Round tariffs facing African exports to the EU, Japan and the United States averaged three-quarters of a percent (about 18 points lower than those the Asian newly industrializing countries [NICs] faced when they began their sustained export-oriented industrialization drive), and preferences give Africa an edge over some competitors (Amjadi, Reinke and Yeats, 1996). As long as transport is expensive, electricity unavailable or unreliable and access to phones restricted, the costs and risks of doing business remain high and the possibilities of reaping the benefits of globalization remain limited. But globalization also offers new opportunities to leapfrog traditional constraints. These new options will be discussed in Section 10.3 of this chapter.

10.2.6 What are the impacts on food consumption patterns?

The effects of freer trade in agriculture, the operations of TNCs in the global food sector as well as urbanization and migration become visible in

changes in food consumption patterns. In general, these factors promote a convergence of food consumption patterns across different countries and regions. The channels through which these factors operate are either direct or indirect via the link of income growth in poorer countries. Rising incomes have an equalizing effect on food consumption patterns as they promote a shift of poorer consumers to higher-value food items, while higher-income segments are constrained by natural consumption limits even for higher-value food items.

A number of concerns revolve around the growing convergence in food consumption patterns. Some analysts see convergence as an indicator of a loss of cultural identity that reflects in part the growing market power of transnationally operating food enterprises (“McDonaldization”). Moreover, there are concerns that a fast convergence in food consumption patterns may have unexpected resource implications. A growing global convergence on, say, a typical United States diet is associated with rapid growth in feedgrain needs and thus with an extra burden on the available agricultural resource base. Another concern associated with a convergence in food consumption patterns is that food would have to travel over ever longer distances and that the externalities associated with these extra “food kilometres” are not, or not fully, reflected in the price of food. This section examines to what extent food consumption patterns have already converged and what the projections to 2015 and 2030 imply for future convergence.

Measuring convergence in consumption patterns.

The comparison of food consumption patterns was undertaken on the basis of 29 primary product groups.¹⁸ The need to compare diets of some 150 countries over a period of 70 years (1961 to 2030) strongly favoured the use of a single indicator, namely the consumption similarity index (CSI). This index measures the overlap in the diets of two countries by comparing how many calories consumed in two given countries originate in the same primary products. The CSI is expressed as:

$$CSI_{j,k} = 1 - \frac{1}{2} \sum_i \left| \frac{CAL_{ij}}{CAL_j} - \frac{CAL_{ik}}{CAL_k} \right|$$

A $CSI_{j,k}$ of 1 means that the diets of country j and country k are identical, i.e. that consumers draw the same number of calories from each of the 29 food categories distinguished in this study, while a $CSI_{j,k}$ of 0 means that the diets of the two countries are entirely different, i.e. that consumers in country j and k draw their calorie consumption from completely different food categories. In principle, the CSI allows the food consumption pattern of any country j to be compared with the one of any other country k .¹⁹ It is important to stress that the CSI only captures the similarities in the structures of the diet in terms of primary products as defined in this study, but does not necessarily capture similarities in the final processed products that are actually consumed. This means that it measures to what extent consumers in two countries rely on a wheat-based or meat-based diet but not whether the wheat-based calories are consumed in the form of noodles or bread, or that meat is consumed in the form of hamburgers or traditional meat products. It is also important to note that the CSI measures similarities in diet structures, regardless of the absolute calorie intake levels. This can result in surprisingly high similarities in diets that are indeed very similar as far as the overall structures are concerned but very different regarding their respective levels of calorie intake (e.g. high shares of meat consumption in pastoral societies with low overall calorie consumption generate a high similarity with meat-intensive OECD diets).

The CSI has been used to compare the food consumption patterns across countries and over years. While CSI calculations have been undertaken for all combinations of countries, the results are only reported for the United States as a “comparator” country. All CSI coefficients are based on a comparison of any given country’s diet with the one of the United States. Convergence over time is convergence towards the United States consumption patterns. The convergence in food

¹⁸ The 28 food commodities given in Annex 1 of this study and a commodity, “other calories”, i.e. all calories consumed and not covered by the 28 commodities of this study.

¹⁹ Note that a CSI of 0.5 between country 1 and country 2 and a CSI of 0.5 between country 1 and country 3 do not mean that the overlap/similarity in the diets between country 2 and 3 has to be 0.5 as well.

consumption reported here may thus be regarded an “Americanization” rather than a globalization of food consumption patterns.

Evidence for convergence. A look at CSI developments suggests that diets have indeed become increasingly similar over time. The speed of convergence, however, differs markedly across countries. The traditional OECD countries form a cluster with consumption patterns that are very close to the United States diet. About 75 percent of the calories in many OECD countries originate from the same sources as in the United States. These countries are fully integrated into the global food economy and their food economies are tied to one another through effective and efficient transportation and communication infrastructures, similar food distribution systems, cold chains, etc. One of the striking features in the group of OECD countries is the high similarity in consumption patterns within the cluster of English-speaking countries (Australia, New Zealand and the United Kingdom) where 80 percent and more of all calories stem from the same foodstuffs.

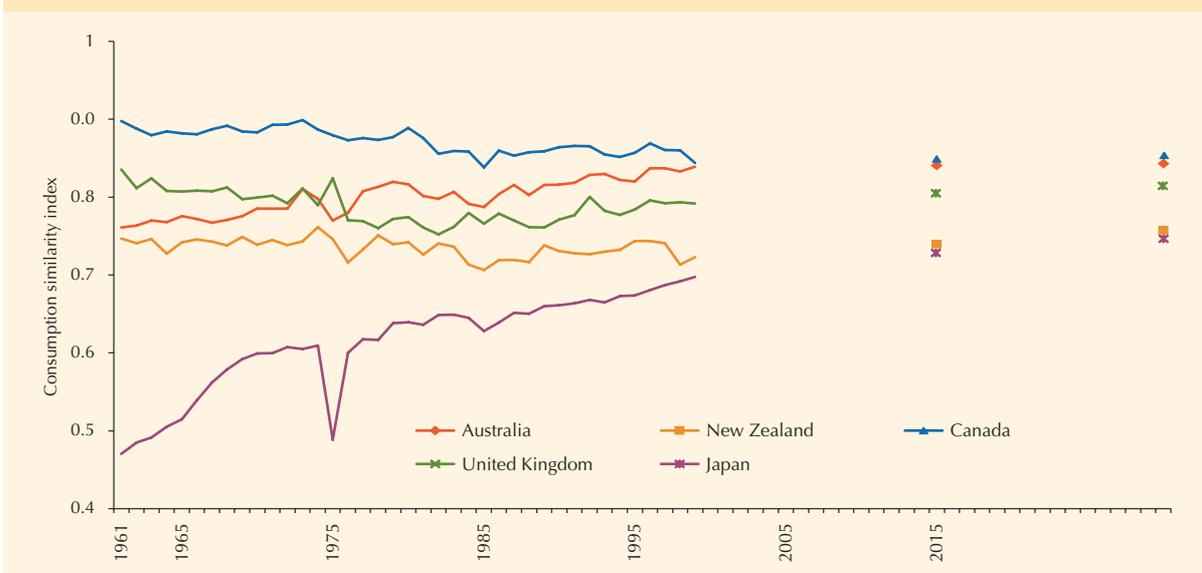
Many of these countries share not only the same language, but have also a common food and cooking culture. The absence of language barriers and the similarity in food culture are important parameters for an effective and low-cost operation

of transnational food enterprises. These similarities allow them to employ the same or similar advertising and marketing strategies and thus reap economies of scale in their market penetration strategies. Finally, there is also a geographic element that plays a role in explaining similarities in diets. For instance, 85 percent of all calories consumed in Canada stem from the same primary commodities as in the United States. Similarly high values exist when diets of North African or western European countries are compared among each other (not with the United States).

Outside the group of the well-integrated western countries, the similarity with the United States consumption pattern is often considerably smaller. Again, there are a number of different groups of countries that exhibit different levels of overlap and different dynamics in moving towards United States food consumption patterns. Very dynamic change can be observed within the group of East and Southeast Asian countries. Japan's consumers are among the most dynamic adapters of a United States-type food consumption pattern. Starting from an overlap of only 45 percent in 1961, similarity had increased to about 70 percent in 1999 and is expected to reach a level of 75 percent in 2030 (Figure 10.4).

Outside the group of OECD countries, a number of different clusters can be identified across conti-

Figure 10.4 Food consumption convergence in OECD countries



Note: The dip for Japan in 1975 reflects a change in diet caused by the drastic price increases in world markets during the world food crisis in the mid-1970s.

nents and regions. Within Africa, three major trends in consumption patterns emerge. First there is the group of North African countries, where consumption patterns are characterized by a grain-rich diet and where often more than 70 percent of the calorie intake stems from cereals, notably from wheat. Within this group, food consumption similarity reaches levels of more than 90 percent. Compared to a United States diet, however, similarity has reached a level of about 60 percent (Figure 10.5) and is, even by 2030, not expected to exceed about 65 percent. This could seem surprising at first sight, given the geographic vicinity to, and increasingly important economic integration with OECD markets. However, other factors override the integrating forces of globalization/Americanization on food consumption patterns. These are rooted in (i) the traditional food culture characterized by high consumption levels of wheat-based staples (bread, couscous); and (ii) the non-consumption of pork that limits the potential for shifts towards meat consumption.

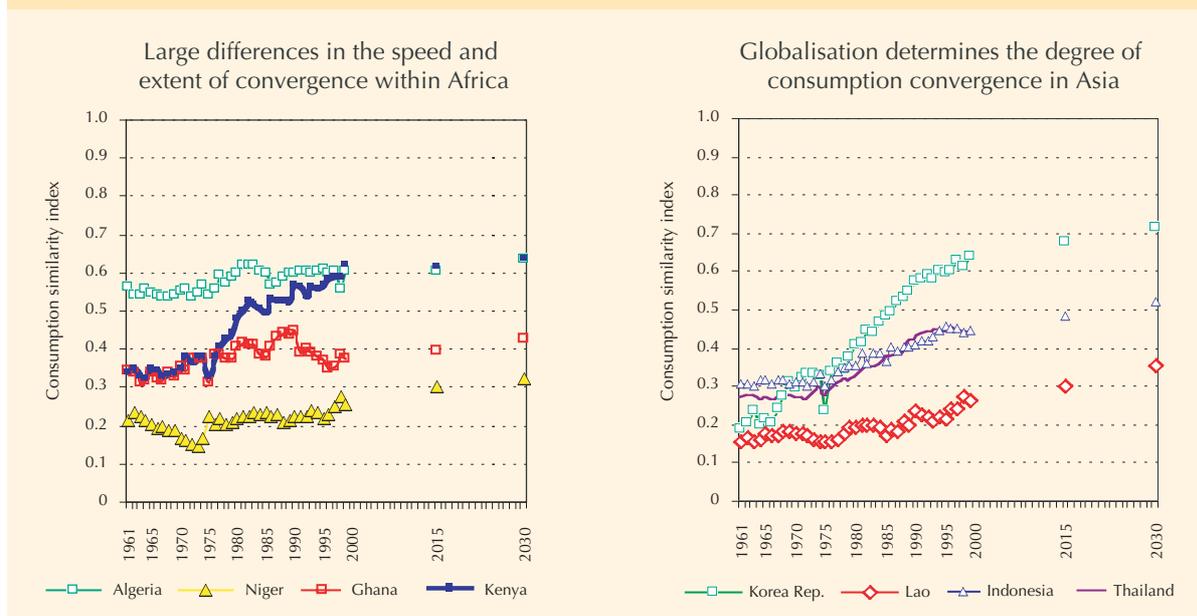
In summary, the forces of globalization have had a significant impact on food consumption patterns and have resulted in a growing convergence of consumption patterns. Even though the relative importance of the various driving forces of globalization is difficult to gauge, openness to trade and investments, geographic location, income levels and growth and TNC activity are almost always associated

with a rapid convergence in food consumption patterns. Many of these factors are interrelated. Well-integrated countries also often enjoy higher income growth that works, within the boundaries of income responsiveness and overall calorie intake levels, as a force for convergence. There are, however, factors of a longer-term nature that put a cap on the convergence of food consumption patterns. They include cultural and religious constraints as well as deeply rooted traditions in food consumption and preparation. As a result they limit convergence, even in the most integrated OECD markets, to a level of about 80 percent, a level that is not expected to be topped over the next 30 years. Outside the OECD area, convergence levels off at about 60 percent overlap.

10.3 Some options to integrate developing countries better

Multimodal transportation systems. The smart combination of various transportation modes (sea, air, rail and road) can help to overcome the financing constraints that many developing countries face in building up traditional infrastructure components. So-called multimodal transportation systems have gained a considerable momentum in integrating hitherto remote areas of Asia and Latin America (Box 10.4).

Figure 10.5 Food consumption convergence in Africa and Asia



Box 10.4 Multimodal transport offers new opportunities for developing countries

The advent of multimodal transportation systems adds to numerous new opportunities for developing countries to integrate faster and more easily into the global economy. In China, for instance, a new service has been established connecting the country's hitherto isolated hinterland with Europe. Multimodal Logistics, a Rotterdam-based company, is now offering rail transport for containers from Rotterdam to northwest China. The Marco Polo Rail Express, as the service is commonly called, has two connecting points at Almaty and Druzhba. The transit time is between two and three weeks depending on its destination in China, which could be Alataw-Shankou, Jinghe, Wusu, Ürümchi, Turpan, Korla or Hami/Yumen (UNCTAD, 1999a).

There is also an effort to connect Singapore and Europe by rail. So far, India, the Islamic Republic of Iran, Pakistan and Turkey have been active in the project. Each participating country must bear the cost of completing the link within its national boundary. The aim is to reduce the transit time for deliveries from Singapore to Europe and vice versa by two weeks. There is also a proposal to construct a tunnel that will link Taiwan Province of China and mainland China in order to accommodate the increase in goods traded and transported between the two countries. The Taiwanese private sector has already responded by investing in new depots in Shanghai and Shenzhen in China.

There are also plans to create a land bridge that would connect Latin America's Atlantic side with its Pacific coast. These plans have grown out of the anticipated congestion of the Panama Canal, which is projected to face serious capacity constraints within the next 15 years. The proposal is to integrate Bolivia's eastern and Andean railways to form a link to and from the Chilean port of Arica and the Brazilian port of Santos. The increase in traffic from such a link is expected to be between 2 and 20 million tonnes with a cut in transport costs of about US\$16 per tonne (UNCTAD, 1999a).

The new transportation systems can be particularly efficient if combined with new communication tools. These new technologies offer considerable potential to overcome the location handicap that many remote areas in the developing world face; they could provide new trade opportunities for bulky or perishable goods that were previously excluded because of prohibitively high transaction costs. This in turn could help integrate agricultural producers and provide a stimulus to rural areas, perhaps comparable to the rapid expansion of agricultural production in the United States Midwest during the first wave of globalization.

Leapfrog traditional communication constraints: the Internet for trade facilitation. As during the first wave of globalization, the availability of more efficient transportation systems has been accompanied by the advent of more efficient communication systems. These new communication technologies enabled shippers to tailor volumes and delivery dates of goods to the precise needs of importers. The Internet now allows even smaller-sized companies to compete with their larger counterparts, who had gained a competitive advantage through the dedicated but more expensive electronic data

interchange (EDI) systems. For the low initial cost of a personal computer, a modem and an Internet connection, anyone can now access the Internet. More and more shippers and carriers choose to do business through the Internet because of the lower administrative costs involved in conducting transactions. This means significant savings because carriers and shippers depend less on third-party value-added networks that are normally required to run EDI transactions.

There is also a growing expectation that the Internet will soon provide all the advantages that had previously been restricted to expensive EDI systems. Most important, Internet data transfer will become increasingly safe. Moreover, it is available 24 hours a day, allowing business deals to be made at the shipper's and carrier's convenience. It could provide niche markets for smaller carriers, enabling them to capture a greater market for small package deliveries.

Economic agglomeration and special economic zones. Despite the possibilities of exploiting further efficiencies in the existing infrastructure, investments in a uniform expansion of infrastructure in every location may be neither an efficient nor an affordable option for most developing countries, particularly in

Box 10.5 The benefits and limits of economic agglomeration

China's special economic zones are a well-known example of a successful formation of spatial agglomerations. These zones have attracted substantive but spatially limited public investments in infrastructure. They have offered free trade with otherwise protected countries and have thus been particularly successful in attracting foreign investment. Alongside foreign investment, skills, production techniques and management knowledge in private companies improved while domestic policy-makers gathered institutional knowledge and practical policy experience. This hands-on experience then helped to attract additional foreign capital and is now helping to develop China's hinterland.

Mauritius' export processing zone (EPZ) provides another example of a successful spatial agglomeration strategy. Operating under free-trade principles, it enabled an export boom in garments to European markets and an accompanying investment boom at home. The Mauritian EPZ was created as part of an overall development strategy in the 1970s. Given the small size of the home market, it was not surprising that Mauritius would benefit from an outward-oriented strategy. The challenge, however, was to smooth the adjustment process for the existing domestic garment sector that had been long protected under the country's ISI regimes. The EPZ scheme also provided a way around political difficulties. The EPZ generated new opportunities of trade and employment, without taking protection away from the import-substituting groups and from the male workers who dominated the established industries. The segmentation of labour markets early on between male and female workers, with the latter predominantly employed in the EPZ, was particularly crucial, as it prevented the expansion of the EPZ from driving wages up in the rest of the economy, thereby disadvantaging import-substituting industries. New employment and profit opportunities were created at the margin, while leaving old opportunities undisturbed. This in turn paved the way for the more substantial liberalization that took place in the mid-1980s and 1990s.

Where these linkages to the domestic sector are not developed, the success of the EPZ model is often less sustainable. For example, during the 1980s the Dominican Republic was able to diversify out of its dependence on agricultural commodity exports by expanding its production of garments for the United States market. However, the country's increasing share of the North American market owed less to domestic competitiveness than to the arrival of United States subsidiaries and their subcontractors in the country's EPZ. When wages increased, foreign investors relocated to lower-wage economies in Central America. Because the export industry never established domestic linkages or generated a national supply base, export growth did little to raise long-term capacity (Vincens, Martínez and Mortimore, 1998). Problems can also arise out of the extensive tax inducements granted in EPZs. EPZs typically offer tax concessions for five to ten years and, in some cases, as in Honduras, they are granted on a permanent basis (Agosin, Bloom and Gitli, 2000). The resulting revenue losses for the national governments can be substantial. For Bangladesh, the revenue losses associated with tax concessions in the EPZ amount to around US\$84 million p.a.

areas where income and population densities are low. As an alternative, a number of manufacturing/service agglomerations could be developed. Large areas with low population densities (sub-Saharan Africa and Central Asia) would still require several such locations and a considerable labour mobility to populate these places. Of particular interest from the perspective of globalization is the formation of dynamic economic regions and export processing zones (EPZs), which often thrive in the open trading environment (Scott, 1998). These zones can become centres of industry, producer services and urban amenities. Their growth derives from trade, the capacity to attract financing and skills, and the use of agglomeration effects to create networking relation-

ships yielding the maximum of synergy. Recent research also suggests that advances in telecommunications, by increasing the frequency of contact between people, can motivate greater face-to-face interaction and make it more desirable to live in cities (Gaspar and Gleaser, 1999).

In most developing countries, a small number of cities – with the capital city in the lead – generate half or more of the country's GDP. These interlocking metropolitan areas comprising an economic region could become the principal "growth pole" for countries (Simmie and Sennet, 1999). These regions could be located in a single country as in Brazil, India and China or straddle two or three countries as they do in Southeast Asia.

Box 10.6 Why and when is two-way trade in agriculture important for developing countries?

There is growing recognition that developing countries can reap important benefits from two-way trade (TWT) and there is evidence that TWT can provide an avenue for successful globalization strategies.

First, a shift towards TWT is typically associated with a shift in trade to processed products and thus higher-value goods. Within a given infrastructure, a shift in trade towards higher-value goods reduces the share of transaction costs per unit of merchandise and thus helps overcome the geographic and infrastructure constraints faced by many developing countries. Second, TWT helps to cope with adjustments in factor markets arising from the large swings in international commodity prices witnessed over the last decades. As trade is largely the exchange of similar and processed products, shocks result in a reallocation of production factors within an industry, rather than between industries. The latter is typically a process that involves the discontinuation of activities in one sector and the loss of jobs, in order to move factors to other industries or sectors. This type of resilience against international shocks can be an important argument for policy-makers in developing countries to integrate their economies faster and more fully into international markets.

Third, TWT in food and agriculture offers economies of scale in the food industry. It enables domestic producers and processors to sell products that are homogeneous with respect to factor requirements but heterogeneous with respect to utilization and marketing to both domestic and foreign markets. Like increased natural protection, scale economies are particularly important when countries want or have to integrate their domestic economy into international markets and expose their domestic sectors to greater competition from abroad. This is a particular benefit for small developing countries, notably small islands, for which TWT could provide an interesting avenue to reap economies of scale, diversify trade and escape the volatility of price swings that they would face otherwise. Fourth, if intra-industry adjustments dominate, commitments towards freer trade are likely to be more comprehensive and to last longer. Empirical studies (Caves, 1981) suggest that increasing IIT following trade liberalization keeps pressures from import competition low. As a consequence, politicians are more likely to press ahead with the process of trade liberalization since the high political cost associated with resources shifting between industries is limited. Finally, IIT in food and agriculture enables those developing countries that are scarcely endowed with productive natural resources (land, water, climate, etc.), to create and foster trade opportunities independent of the ability to produce primary agricultural products. TWT in food and agriculture has boosted the food processing sector in many Asian economies and created a trade surplus for countries that lack the climatic and agronomic conditions for a flourishing agricultural export economy.

Most developed countries have vastly benefited from the productivity gains that economic agglomerations and clusters provide. Agglomeration gains were probably most pervasive during the second wave of globalization, when trade between developed countries became determined not so much by comparative advantage based on differences in factor endowments but by cost savings from agglomeration and scale. Because such cost savings are quite specific to each activity, although each individual industry became more and more concentrated geographically, the industry as a whole remained very widely dispersed to avoid costs of congestion.

However, while agglomeration economies are good news for those in the clusters, they are bad news for those left out. A region may be uncompetitive simply because not enough firms have chosen to locate there. As a result “a ‘divided

world’ may emerge, in which a network of manufacturing firms is clustered in some ‘high wage’ region, while wages in the remaining regions stay low” (Yussuf, 2001).

Intra-industry trade in agriculture. Classical trade theory suggests that countries specialize in international trade according to differentials in production costs for different goods. These cost differentials can result either from efficiency differences in the use of production factors (Ricardian trade specialization) or from differentials in factor endowment (Heckscher/Ohlin). When developing countries specialized in producing and exporting agricultural products for which they seem to have a classical “comparative advantage”, they were facing increasingly binding constraints for their potential to grow (relative to world markets). This was not neces-

sarily as a result of limits in domestic factor endowments or as a result of trade barriers in markets abroad (see Chapter 9), but simply because the export markets they produced for exhibited low and declining demand elasticities, while their own import demand remained elastic.²⁰ This created the so-called “elasticity pessimism” and the economic rationale for the import-substituting industrialization (ISI) strategies pursued by many developing countries in the 1950s and 1960s (see Section 10.2.1 above).

Krugman (1986) showed how a country could overcome the elasticity constraint by embarking on intra-industry trade (IIT) or two-way trade (TWT) in differentiated products. The principle is as follows: if consumers have a certain taste for variety, each new differentiated product creates a niche and the corresponding demand. If the number of products produced in a given country is related to the size of the economy, then the countries with the fastest growth also tend to produce more products. Contrary to the traditional view, this mechanism does not need a price (exchange rate) or demand adjustment to equilibrate the trade balance. Instead, the mechanism works

endogenously. The country with higher growth produces more product variety, which in turn generates its own export markets.

These microeconomic effects play a role in the growth process and interact with macroeconomic policies, notably with the exchange rate. For example, there is evidence from a comparison between the Republic of Korea and Taiwan Province of China that the latter was able to generate more product variety than the Republic of Korea and rely less on a continuous competitive devaluation to gain a market share (Oliveira Martins, 1992 and Feenstra, Yang and Hamilton, 1999). More recent work has also shown a positive and significant impact of product variety on relative export intensity and growth (Funke and Ruhwedel, 2001).

In practice, however, TWT in food and agriculture was largely limited to trade within developed countries. In developing countries, trade patterns in food and agriculture remained biased towards a traditional (inter-industry) trade specialization, which broadly reflected two major factors. First, a great number of developing countries experienced low GDP growth rates and failed to attain the GDP

Box 10.7 How has two-way trade been quantified?

To measure the order of magnitude and the development in IIT specialization, a modified Grubel-Lloyd (GL) index of two-way trade (TWT) has been computed. The modification of the GL index was necessary to account for the overall trade imbalance in food and agriculture that is characteristic of many developing countries. The TWT index for n products (i) and a given country j is computed as follows:

$$TWT_j = 1 - \left[0.5 \cdot \frac{\sum_{i=1}^n X_{ij} - \sum_{i=1}^n M_{ij}}{\sum_{i=1}^n X_{ij} + \sum_{i=1}^n M_{ij}} \right]$$

where X_{ij} , M_{ij} are export and import values in current US\$.

In general the TWT index measures the proportion of total trade (sum of values of imports and exports) that is composed of trade in “similar products”. A value of the index close to one indicates that there is predominantly IIT (i.e. in differentiated products), while a TWT value close to zero suggests that trade is primarily inter-industry trade, i.e. in different products. The computations reported are made at the highest possible disaggregation level that is allowed by the data (the FAO trade database for food and agriculture comprises a maximum of 521 different products).

²⁰ Even for the development of a competitive food processing sector, most developing countries are simply too small to reach the necessary economies of scale. Where developing countries have made significant inroads into food processing – for example, orange juice production in Brazil, canned pineapples in Thailand and soluble coffee production in Colombia and Brazil – the scale required for efficient production means that upstream access to raw materials and downstream access to markets must also be secured on a large scale. Many developing countries lack the raw materials, capital and market access to make processing viable (UNCTAD, 2000).

levels required to stimulate a greater diversification of demand and eventually rising IIT. Second, growing TWT goes hand in hand with the development of an internationally competitive food processing industry, a process for which most developing countries faced major constraints. Food processing industries are well established in the industrialized countries.

But indicators for trade diversification and specialization (Table 10.3) also show that the difference in the levels of TWT between developed and developing countries was not always as pronounced as in the 1990s. Throughout the 1960s and 1970s, IIT in agriculture has been low when compared to manufactures, in developed and developing countries alike. However, while TWT remained at low levels in developing countries, many developed countries recorded a rapid growth in TWT trade over the 1980s and 1990s. For the United States and the EU, for instance, the level of TWT in agriculture increased rapidly since the early 1970s, while the TWT coefficients remained largely unchanged throughout the developing world. In sub-Saharan Africa, TWT accounts for merely 16 percent of total agricultural trade and this share has remained unchanged since

1970. The level is higher in the Near East/North Africa and South Asia but there too IIT in food and agriculture stagnated.

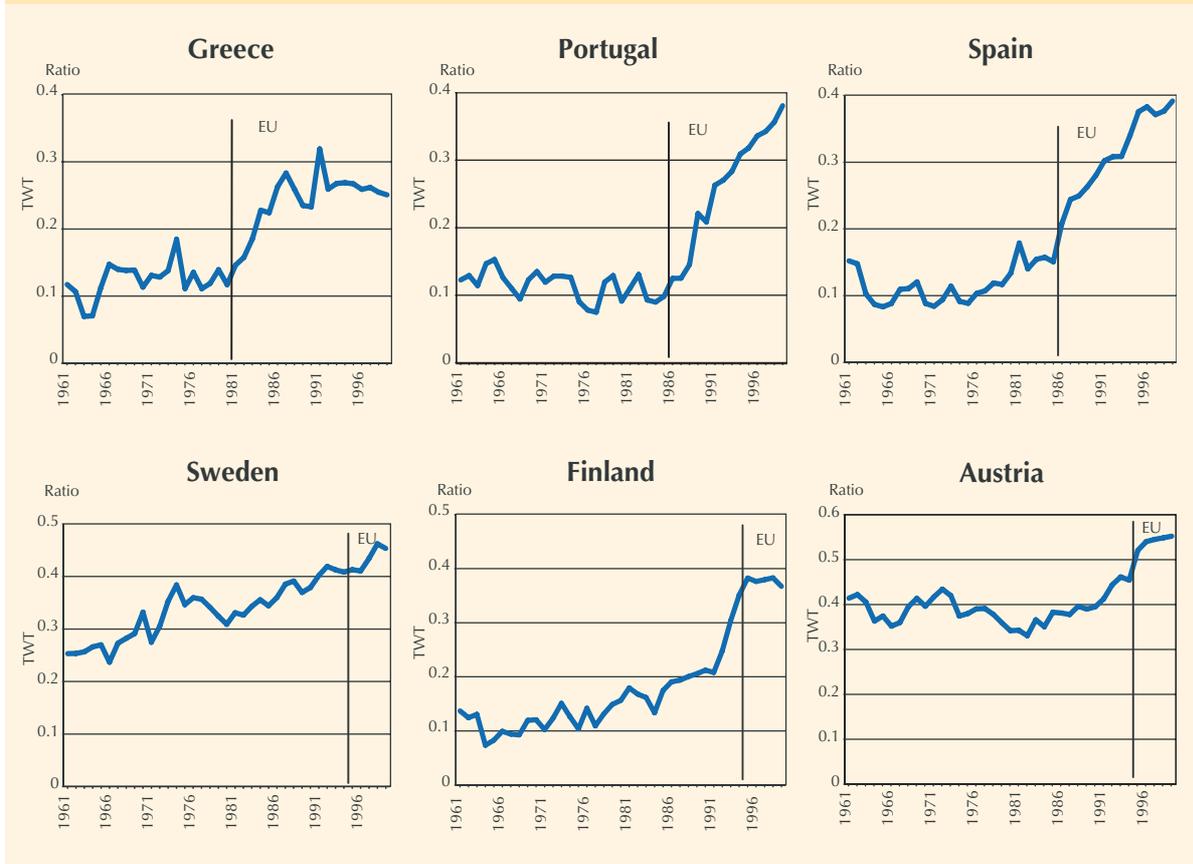
A closer inspection of country-specific information suggests that the level of TWT in agriculture increases rapidly when trade barriers are reduced and even more so when countries integrate their economy into a common economic market (Figure 10.6). Such a change is accompanied not only by the increasing amount of IIT, i.e. by the volume of exports and imports of similar products, but also by a rapid increase in the number of products traded. For countries that are firmly integrated into a common market (the Netherlands, Belgium), TWT in food and agriculture has reached levels that are comparable to those attained in manufactures. Country-specific data also reveal that a rising TWT is often associated with a growing trade surplus in food and agriculture and vice versa. This suggests that the ability to generate a trade surplus in food and agriculture does not so much depend on the ability of a country to produce a certain amount of raw material as on the country's capacity to produce differentiated products and to cater for specific markets, including market niches.

Table 10.3 Two-way trade in food and agriculture, by region

Region	TWT (percentage)			Number of products traded		
	1969/71	1984/86	1997/99	1969/71	1984/86	1997/99
Developed countries	25.2	30.2	34.6	252	297	279
EU	28.4	33.4	45.3	278	329	395
North America	31.0	33.8	44.8	280	315	390
Other countries	18.5	21.3	26.8	199	236	332
Developing countries	17.4	17.6	20.4	98	119	194
East Asia	13.9	17.5	16.0	101	136	186
Latin America and the Caribbean	14.0	15.3	18.1	122	139	234
Near East/North Africa	29.2	28.2	29.5	120	146	200
South Asia	17.7	17.6	13.5	96	167	227
Sub-Saharan Africa	16.4	15.7	16.8	77	79	142
Transition economies	26.3	19.0	28.9	118	121	269
Eastern Europe	25.2	19.3	28.0	117	119	278

Source: own calculations.

Figure 10.6 Two-way trade in food and agriculture, the effects of economic integration



10.4 Concluding remarks

Globalization – the growing integration of economies and societies around the world – is a complex process that affects the world’s food and agricultural economy in numerous ways. Cheaper and faster transportation, easier communication and the development of the Internet are important drivers. Also important are a growing number of international agreements that have codified and liberalized the flow of goods and capital. These factors have resulted in a rapid expansion of trade and FDI but also in the rise and growing influence of transnational companies. The impacts of these new factors have been very positive overall, even though the benefits are distributed unevenly. For example, globalization has helped to fight poverty and undernourishment in China, Viet Nam and Thailand, but has done little so far to integrate the poorest in sub-Saharan Africa, to improve their food security, or to enable the region’s farmers to make significant inroads into markets abroad.

This raises the question as to what factors determine success or failure, integration or marginalization. Why have some countries been able to take advantage of the great development potential that globalization offers while others have failed to do so?

Some of the correlates of success or failure have been identified in this chapter. To begin with, openness to trade and capital flows, and the ability to adopt and to adapt technological innovations are undoubtedly among the important factors for success. Also geographic location and endowment with infrastructure can play a crucial role in determining whether a country thrives or falls further behind in an increasingly globalized economic environment. But probably most important are the domestic incentive system and the companion policies that facilitate the integration process.

A number of examples have been presented to document success and failure in the process of globalization. No claim is being made that these examples are representative or comprehensive. Nonetheless, the examples suggest that a number

of common features are associated with success or failure in the process of global integration.

First, while openness to trade and investment flows is an important contributor to a successful global integration process, openness alone is not a guarantor for success. In many cases, openness has emerged gradually alongside overall economic and agricultural development. At the same time, no country has recorded high growth in the long term on the back of infant-industry protection and import substitution policies. Nowhere have insulation and protection spurred on agricultural growth and overall development in a sustainable manner.

Second, successful globalizers are masters in managing adjustment. They succeed in rationalizing excess capacities and create exit possibilities for farmers and new employment opportunities at minimal cost. The creation of township and village enterprises in China, the pruning of excess capacity in Viet Nam's coffee sector and credit restrictions imposed on unproductive chaebols in the Republic of Korea have been mentioned. Gradual adjustment is particularly important for agriculture, as a large part of the human and financial capital of the sector is fairly immobile in the short term. Managed transition provides an opportunity to reallocate resources or gradually depreciate them. Active adjustment management also helps to mitigate adverse impacts for the poor.

While the process of structural change often creates greater opportunities for the poor in the medium term, it also means that they have to bear short- to medium-term transitional costs that they are ill positioned to absorb. This is particularly true of trade reforms, where the adjustment costs often come upfront, while the benefits are seen only over a longer period of time. The policy measures to manage adjustment entail an appropriate mix, sequencing and phasing of trade reforms; they also include measures that prepare farmers and processors for international competition, e.g. through training and technical assistance. Even where and when border protection is largely removed, farmers can vastly benefit from measures that protect them from excessive price swings (e.g. China and Viet Nam).

Successful integration is also a process of learning and experimenting and there are measures that promote this learning process. The two-track system in China's agriculture (both in terms

of export orientation and in terms of free market plus government control) seems to work. It has allowed policy-makers to gather experience as to what system works and what does not, as to what farmers can do best and what not. Two-track systems have also proved useful in opening up to international competition without facing the costs of massive and rapid adjustments for a whole economy. Probably the most prominent examples for successful two-track systems are China's special economic zones and Mauritius' EPZ. There are various channels through which these two-track systems facilitate transition towards freer environments. They allow, for example, a country to provide foreign investors with special conditions that may be difficult to guarantee for the whole economy. They also help domestic companies to prepare for growing competition from abroad and allow policy-makers to adjust the domestic framework of competition policies to an environment of freer trade and capital flows.

Globalization has generated growth in FDI that exceeded growth in trade flows. FDI inflows can play a catalytic role for development. FDI provides not only an important source of finance. More important, it is a carrier of technology, skills and management techniques. But, as with trade, success rests not only on the degree of openness. As important as the quantity of inflows is the quality of FDI. High-quality FDI is characterized by low repatriation levels and intensive linkages to domestic farmers. Experience from FDI in India's food industry, in particular, has demonstrated its potential for promoting agriculture and overall rural development. TNCs provided farmers with better seeds, enhanced technologies and more stable prices and thus boosted crop yields and farm incomes. The contracts that forge these linkages are crucial for success. But there are also examples where FDI largely failed to create linkages with local farmers and even instances where TNCs have added to the marginalization of whole farm populations. Developments in the global coffee markets illustrate this point. There is evidence for a growing concentration in trading and processing of coffee and there is also evidence that TNCs managed to reap a growing share in the total value created in the coffee marketing chain. It is however less clear to what extent these developments reflect the abuse of market power and the absence of an appropriate

competition policy framework that can address the new competition policies in a globalized market.

Globalization in agriculture has also been brought about by an internationalization of production technologies. The green revolution was the single most important vehicle in this process. Again, while some countries have been phenomenally successful in adopting these new technologies, others have largely failed to do so. As with trade and investment flows, the correlates of success are not merely openness to innovation. Numerous studies suggest that it is more important to create the appropriate domestic environment that allows local producers to employ the new technologies gainfully. In short, adoption has to be accompanied by adaptation to provide success. Similarly, success or failure in reaping the benefits of biotechnologies will depend less on availability than on the capacity to adapt the new technologies to the agronomic and economic environments that prevail in a specific location. Finally, geographic location and infrastructure endowment play a crucial role in successfully tapping potential world markets. There is ample evidence that the lack of infrastructure (not the existence of trade barriers) has been the crucial impediment that hindered sub-Saharan Africa's farmers from making significant inroads into OECD markets.

But there is also evidence that globalization can offer new opportunities to leapfrog old obstacles resulting from unfavourable locations or inade-

quate infrastructure. In general, new technologies are cheaper and faster and can bring the most remote areas to the heart of the markets. These include Internet-based business communication systems as well as multimodal transportation systems. In sparsely populated regions, transaction costs can be reduced by promoting economic agglomeration.

In summary, globalization offers a great potential for farmers and the entire food sector of developing countries. Many developing countries are successfully tapping this potential, but not all of them are able to take full advantage of the new opportunities. The ability of a country to reap the benefits of globalization depends on factors such as openness to trade and capital flows, ability to adopt technological innovations, and also geographic location or infrastructure endowment. The various examples suggest that openness and outward-oriented policies characterize many successful globalizers but *per se* they are not guarantors for success. More important are the companion policies on the domestic front that facilitate integration into global markets. These are policies that provide appropriate transition periods towards freer trade; help adapt new, external technologies to the domestic environment; and provide competition policy settings and design contracts that also allow small-scale agriculture to thrive within the operations of TNCs.