

# **Globalization and the Challenge for Developing Countries**

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# **Globalization and the Challenge for Developing Countries**

## **The Rise and Future of Globalization**

The twentieth century began when the first wave of globalization was approaching its peak. It has ended on the rising crest of a second wave far more forceful than the first. Globalization is a source of both hope and of apprehension. One reading of economic change over the past hundred years points to strong benefits from closer integration. Openness to trade, factor flows, ideas and information have powerfully stimulated progress, economic and political. The most open nations are at the forefront of the advance. And when the leading industrial economies turned inwards after the First World War, the retreat from globalization was a grave setback for the entire community of nations. By some estimates, the spread of tariff and non tariff barriers affected between 50 and 70 per cent of total trade (Crafts 2000). It was only after the process was resumed slowly and fitfully in the 1950s,<sup>1</sup> that the economic tempo quickened and resulted in five golden decades.<sup>2</sup>

The paper argues that there are several key and interrelated elements to globalization and that the future gains will derive from the degree to which countries are willing to embrace them together rather than in a sequenced fashion. Moreover, the future course of globalization is by no means assured in spite of the added momentum

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<sup>1</sup> The first GATT round was completed in 1947.

<sup>2</sup> However, five decades of growth did not help to close the gap between rich and the poor, except for a “convergence club” comprised of East Asian countries. A study using household survey data drawn from 91 countries for 1988 and 1993 found that inequality measured by the Gini index rose from 63 to 66. This was mainly the result of changes in mean incomes and not rising inequality within countries (Milanovic 1999). Boltho and Toniolo (1999), drawing on data for 49 countries, find that using country income weighted by population, shows a modest trend towards convergence starting in 1980 and helped by the higher growth of the incomes in India and China.

imparted by the gains in communications technology and the spread of the Internet. The degree to which countries have moved toward globalization varies widely. In both the industrialized and the developing countries skeptics question the benefits, and there is considerable resistance to further integration, resistance which stiffened following the east Asia crisis of 1997-98. The failure of the Seattle summit to launch the Millennium Round in November 1999 revealed the absence of the requisite political support and signaled the widening of the debate on globalization.<sup>3</sup> While few contest the economic returns from greater openness, they are perceived as having been unevenly distributed both between and within countries.<sup>4</sup>

For some groups, the rising flow of trade and capital has heightened the sense of vulnerability. Blue and many white collar workers in industrialized countries fear being displaced by cheaper labor in developing countries<sup>5</sup>. The volume and volatility of capital flows, has increased the risks of banking and currency crises as well as their costs (World Bank 1999). Production and trade is increasingly dominated by transnational corporations which use the options afforded by globalization to their own best advantage, and without much regard for the longer term development objectives of individual countries. There are also those who fear that an excessive focus on material progress threatens the sustainability of development and the cultural underpinnings of societies. The environment is being irreversibly degraded, and 'cultural capital' is being lost as the

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<sup>3</sup> The power of the Internet in marshaling protest increases the possibility of a backlash. The failure to ratify the Multicultural Agreement on Investment was because of a well orchestrated effort mounted by international NGOs using the Internet to galvanize widespread support. Similarly, the resistance to the meetings in Seattle reflects "the changed dynamics of contention in the global age". (Ayres 1999, p. 133)

<sup>4</sup> Within countries, trade can reduce inequality measured by the Gini coefficient as revealed by a study of 73 countries (Chakrabarti 2000).

<sup>5</sup> This is a repeat of the passions aroused in the pre-World War I period in the labor scarce economies when trade increased the elasticity of demand for labor (Williamson 1998).

result of an incipient homogenization of tastes, beliefs, and cultural markers<sup>6</sup>. Even revolutionary technological advances – such as genetically modified crops – whose spread is associated with the global influence of TNCs, are viewed with suspicion.

Finally as the world integrates, states – and the elites dominating governments – fear the loss of authority in making macro and industrial policy, in allocating resources, in defining their political, legal, social and economic institutions and in managing their affairs.<sup>7</sup> They worry about the press of competition from other countries, the power of global public opinion, of international institutions (such as the GATT/WTO and the Basle Accords) and the pressures exerted by NGOs,<sup>8</sup> UN agencies and transnational corporations (TNCs).

Although it is difficult to imagine how the seemingly inexorable march of globalization and the gains it provides to consumers and exporters,<sup>9</sup> could be appreciably slowed, or even reversed, experience warns against taking trends for granted.<sup>10</sup> The future of global integration will depend, as it has in the past, on the strength of perceived benefits and the capacity of the gainers in winning their case politically, on the success at building an institutional scaffolding - domestic and international - adequate to the task of

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<sup>6</sup> In countries such as France, the fear is growing that its culture and heritage is being worn away by a universal culture “that looks strangely American” and reflects “the success of its melting pot, which in an age of globalization is exported world wide” Moisi (1998, p. 96.)

<sup>7</sup> GATT also accommodated a fair amount of economic nationalism less permissible now under the WTO disciplines (Zeiler 1999). This can be irksome, especially for developing countries that now account for three fourths of WTO’s 134 members. Apart from the concerns of the industrialized countries, lack of support from developing economies could prevent the reaching of future accords on trade (Runge and Senaur 2000). The influence of interest groups on trade policy is explored by Freund and Djankov (2000). They find that income inequality and a variable proxying the incidence of corruption derived from the International Country Risk Guide exert a strong positive influence on protection and a negative one on import penetration.

<sup>8</sup> The number of international NGOs rose to 26,000 in the 1990s (Keohane and Nye 2000).

<sup>9</sup> Ng and Yeats (1999) show that the more open low income countries are integrating faster than other countries.

<sup>10</sup> See Garrett, 2000. In May 2000 ASEAN ministers, sensitized by the recent crisis, decided to defer a planned opening of their markets to automotive imports. They were also unable to break a deadlock regarding the time table for opening the trade in E-business. *Oxford Analytica*, ASEAN: Free Trade Retreat, May 4, 2000.

managing a variety of flows among countries, and on policies which prepare economies to meet the challenges arising from openness. There can be little doubt that with the ending of the Cold War, the U. S. and a few of its western allies are no longer able to play a decisive role in the crafting of international institutions or willing to give primacy to collective goals over narrower national interests. The increasing number of states and other entities with a voice also makes it much harder to reach agreement on bold measures in support of further global integration.

This paper will concentrate mainly on the first and third items. It identifies five interlinked aspects of globalization which present opportunities for developing countries – and discusses appropriate policy actions. The paper has less to say about institutions because this topic has been extensively dealt with in a number of recent publications including, most notably, the World Development Report 1999/2000.

### **Key Policy Dimensions**

Globalization impinges on development from several directions. Of greatest significance for national policy are:

- Growth of trade
- Capital Flows and Financial Capability
- migration
- IT and the Web
- diffusion of technology

All parts of the world are affected by globalization through these channels, but it is

important to remember that the full force of change is felt by a relatively small number of upper and middle income countries.<sup>11</sup> Most economies are only partially integrated into the global system. While this insulates them to a degree from the risk of turbulence associated with volatile short term capital flows it also prevents these countries from tapping the resources, energy and ideas inherent in globalization. Not surprisingly the high income members of the OECD are the most closely interlinked through trade, capital movement and the communications network.<sup>12</sup> Close behind are a group of East European and East Asian, middle income economies which are steadily converging towards the per capita income levels of the industrialized nations. A handful of Latin America countries have begun dismantling controls and are approaching a degree of openness equivalent to their Asian competitors. The remaining middle income and developing countries lag far behind and the income gap between these and the richest nations has continued widening. Forty years ago the per capita incomes of the twenty richest countries were fifteen times the level of the twenty poorest countries. This ratio has now doubled to thirty.

Many reasons have been put forward to explain the convergence of a few countries and the widening income disparity between the high income nations and the majority of the developing ones. Among them, the cluster of factors grouped under the rubric of globalization arguably rank uppermost. Furthermore, I will argue that greater integration with the world economy conducted simultaneously through the several channels noted above, when combined with policy measures and institutional change,

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<sup>11</sup> Keohane and Nye (2000) refer to thick and thin globalism to differentiate between countries. A country is in the “thick” of globalization when external relationships are both extensive and intensive. Thomas Friedman (1999) differentiates current from past globalization by noting that the ongoing trend goes “farther, faster, deeper and cheaper.”

is likely to be the most effective means of augmenting key factor inputs and total factor productivity (TFP) that are responsible for income growth. Moreover, the risks of this strategy can be ameliorated, and delay in embracing greater openness is rarely utilized to implement reforms that induce institutional depth, resource mobilization and industrial growth. It is the spur provided by external competition and greater exposure to ideas and information which quickens the pace of change.

### **Using Trade to Promote Development**

Trade is central to globalization and the starting point of a discussion on prospects for developing countries and on policies, but it is only one aspect of openness and must be complemented by others in order to yield its full effects. The association between trade, total factor productivity and growth has been long debated and strongly reaffirmed, most recently by Krueger (1997) and Srinivasan and Bhagwati (1999)<sup>13</sup>. Recent research is sharpening our understanding of how trade acts on each of these. The conventional wisdom, based largely on the performance of the east Asian economies, was that the principal impulse was through exports. Trade enlarged the markets for domestic producers, allowed them to reap scale economies, forced them to be competitive and offered incentives and opportunities to assimilate as well as develop new technologies. Export earnings also loosened foreign exchange constraints on the economy thereby

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<sup>12</sup> However, large countries, such as the U. S. are less open because of the scale of the domestic market. See Garrett (2000) and Frankel (2000), who notes that the ratio of trade to GDP is only a sixth (12 percent) of a hypothetical level given by the share of the U.S. in global output.

<sup>13</sup> This is also supported by the findings of Ng and Yeats (1999). Countries with more open policies and unrestrictive governance achieved higher levels of per capital GDP. The effect of openness on income per capita ranges from 0.3 to 3.0. Increased global integration of the U.S. economy since the 1950s has raised incomes by 12 percent (Frankel 2000). See also the dissenting views expressed by Rodriguez and Rodrik (1999).

facilitating the expansion of other sectors. This neomercantilist approach leaned towards the grooming of selected industries with export potential and favored the protection of import competing industries.<sup>14</sup> It is responsible for the continuing popularity of export-led growth, the emphasis on manufacturing activities, and the prevalence of high trade barriers in many developing countries.

Ongoing research has modified our perspective in a number of respects:

It appears that even the most successful east Asian economies derived modest gains in TFP from the emphasis on exports, through the mid 1980s. Since then, TFP growth has been higher, and it may be partly related to the growing trade in technology intensive products which yield more learning by doing.<sup>15</sup> Moreover, companies which thrive as exporters are the ones that are able to cross a productivity threshold prior to engaging in trade.<sup>16</sup> Certainly, exports were a source of demand but growth was driven mainly by factor inputs and not by efficiency and technological gains arising from the export-push.<sup>17</sup>

Reducing protection whittles away distortions in the prices of capital goods and also discourages industrial policies which can be a source of rents. Such protectionist policies dampened the performance of India through the 1980s and also of the Latin American countries (Crafts 2000). Furthermore, imports may be a more important vehicle for technology transfer embodied in equipment and the technical assistance provided by suppliers.<sup>18</sup> Imports also force the contraction of inefficient producers and induce the survivors to become competitive by adopting a range of superior practices,

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<sup>14</sup> See for instance Amsden (1989).

<sup>15</sup> Ades and Glaeser (1999) using cross-country data since 1960 and data for U.S. states in the nineteenth century, show that increased demand arising from openness raises growth.

<sup>16</sup> Bernard and Jensen (1999).

<sup>17</sup> See Crafts (1999) for a review of the evidence.

techniques and product refinements. For both of these reasons imports can have a stronger link with TFP than exports.

Developing countries have tended to neglect services-which accounted for a fifth of total trade in 1999 or \$1.3 trillion- to the detriment of their manufacturing subsectors which rely on the efficiency of services, e.g. marketing, advertising, consulting and logistics- to achieve high rates of growth and export earnings. Starting from a small base, trade in certain types of producer services is now expanding faster than for goods (World Bank 1999). Hence, future growth will depend to a greater degree on the dismantling of barriers to trade in services, which remain high, and on incentives to promote competitive service industries. The importance of the service sector as a source of employment is on the increase and countries wanting to participate actively in the IT sector, production networks, and related activities must, in future, push their development as vigorously as that of manufacturing.

Furthermore, low income countries whose comparative advantage over the foreseeable future will lie in agricultural commodities, light manufactures and assembly type activities, will need to enhance their access to export markets. This calls for a more active, coordinated and strategic participation in trade negotiations – in the making and the extracting of trade concessions. Even though barriers have declined as a result of the Uruguay Round, trade in textiles and certain agricultural commodities (e.g. sugar, rice, peanuts), continues to be constrained by tariff and quota restrictions.<sup>19</sup> Agricultural exports from developing countries face tariff barriers averaging 16 percent in developed countries and 20 per cent in developing countries (Hertel et al. 2000). If the post -

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<sup>18</sup> Rodriquez-Clare (1996) has shown that by inhibiting technology adoption, tariff barriers can significantly reduce growth of incomes over the longer term.

Uruguay Round tariffs on agricultural products were to be reduced by 40 per cent, it is estimated that global incomes would rise by \$60 billion (Hertel et al 2000).

The Integrated Framework for Trade Related Technical Assistance, operated by six international agencies, provides countries with the means to assess their priorities and to engage more actively in trade negotiations. But some hard negotiations lie ahead if developing countries are to obtain guaranteed preferential access for some of their products and also to find ways of satisfying or surmounting barriers such as the phyto-sanitary and sanitary regulations.

Greater openness will also help firms in developing countries to become a part of the international production networks and supply chains that are the main conduits of trade.<sup>20</sup> Already two thirds of all trade is either within transnational corporations (TNCs) or associated with TNCs through arms-length transactions (UN 1999). Global supply chains organizing production and trade are of two forms: there are producer driven commodity chains run by TNCs in industries subject to entry barriers arising from capital intensity, technology or proprietary information. Here association usually results from equity investment by the TNC. Buyer driven commodity chains (BDCC) allow firms in developing countries greater freedom of entry. These are chains managed by large retailers, name brand marketers and trading companies that place orders with local producers and supply the design, specifications and in some cases the material as well. BDCCs are entrenched in labor intensive consumer goods and to break into markets for toys, household goods and footwear for example, firms in developing countries must link

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<sup>19</sup> However, exports from African countries face zero or very low trade barriers in OECD markets (Ng and Yeats 1999)

<sup>20</sup> See the discussion on diasporas below.

with these chains. Aside from production capacity, success depends on several factors. One is establishing a relationship with a supply-chain intermediary,<sup>21</sup> who manages the allocation of production, batching and delivery. Another is the adoption of information systems, order fulfillment practices, and quality standards expected by buyers in intensely competitive markets. Access, to imported inputs, to shipping facilities and other infrastructure has also been a determining factor in China's export success and India's slow start. Some research of recent vintage suggests that countries could be helped by exchange rate stability through the adoption, for instance, of a common currencies or currency board-e.g. reducing exchange rate variability by one standard deviation increases trade by 13 percent between a pair of countries (Frankel 2000).

This experience can help to focus trade related policies in four respects. In the first place, the likelihood of achieving export competitiveness is greatest in domestic resource intensive industries which can benefit from access to locally available inputs and skills. For example, Malaysia and Indonesia entered the export market with natural resource intensive products and these still remain the mainstay of their export drive. India and Bangladesh are competitive in labor intensive low-end cotton garments and textiles. Once an economy has established a reputation in export markets and built up a production base, it can pursue other possibilities with superior growth prospects over the longer term. The creation of an outward-oriented industrial base, however small and specialized, is also a signal to foreign investors. By changing perceptions about the nature of the local environment – as China's SEZs did during the late 1970s and early 1980s - such initial steps make it possible to draw resources and technology from the global economy and enter a virtuous spiral.

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<sup>21</sup> One well known supply-chain manager is Li and Fung of Hong Kong (Magretta 1998).

Second, industrialization is more likely to draw impetus from rising productivity and participation in international production networks, if barriers to imports are scaled back. In many instances, tariffs on capital goods and intermediates yield little revenue because of evasion or exemptions but they do introduce distortions, raise transaction costs for producers, reduce foreign direct investment (FDI) and discourage import substituting industries from striving after competitiveness. Brazil's experience indicates that although trade liberalization can lead to a loss of jobs in the short term, over the longer run this is outweighed by a more labor intensive output mix (Moreira and Najbert 2000). While multilateral trade liberalization, with reciprocal concessions, is the more attractive avenue, the gains from unilateral reduction in trade restrictions can benefit growth and serve as a bargaining chip in future trade negotiations, whether regional or international (World Bank 1999).

Third, policies which encourage domestic and foreign investment in services and expose local suppliers to competition are at least as important as those directed towards manufacturing.<sup>22</sup> For many of the smaller developing countries, services is a promising leading sector. The declining costs of supplying particular kinds of services using electronic channels is rapidly lowering entry barriers for countries willing to invest in technical and English language skills as well as the physical information technology (IT) infrastructure. In fact, the market for a wide range of existing and emerging services is on the way to becoming more globalized than the market for goods. Data processing and call centers are already migrating to developing countries. More sophisticated services

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<sup>22</sup> Although local language websites are proliferating in East Asia, the dominance of English has even led to a greater stress on English language skills in Japan and Korea. *Far Eastern Economic Review*, Local Lingo, May 4, 2000 and *Far Eastern Economic Review*, Lingua Future. However, as the numbers of non-native speakers using English increases, the character of the language is likely to change and for many purposes, simplified and specialized forms of English could proliferate (Wallraff 2000).

could quickly follow if countries take the necessary policy initiatives. For these reasons, expanding the coverage of GATS to cover all services and greater transparency on rules influencing market access would have a large payoff (Hertel et al 2000).

Industrialization may have ceased to be a necessary stepping stone to prosperity. Even predominantly rural economies, who are able to build up human capital using both conventional and distance learning techniques can become active participants in the global economy. The beauty of globalization in its current stage is ease of entry in certain areas, which enhances the opportunities for producers in developing countries with skills, products and ideas.

Last, while building export capability must remain a major policy objective, of equal importance is the methodical sweeping aside of trade barriers. There is scope here for developing countries to take the initiative in helping launch a new round of trade negotiations which could draw them into the mainstream of globalization. The danger is, that in the absence of such initiative, the benefits of globalization will continue to be monopolized by a few countries while the shocks and setbacks, if they are severe, will affect the entire world economy. The urgent policy decision is to invest in the skills and knowledge required to define priorities, win the domestic political battles, and to engage purposefully but flexibly in negotiations.

## **Varieties of Capital Flows and their Effects**

Another major facet of globalization is the vast increase in capital flows and their diverse composition.<sup>23</sup> As with trade, the bulk of FDI, portfolio flows and short term capital circulates within the OECD and a handful of the emerging economies in East Asia and Latin America. These flows have become a major source of investment, a conduit for technology transfer and a spur to financial deepening. Short term capital movements have also been linked with the upsurge in banking and currency crises culminating in the major shock which hit east Asia in 1997.

The jury is still out on whether greater openness to financial flows can be a source of instability and on the effects of capital controls on term structure of inflows, but research is clarifying the implications of financial globalization and showing, for example, how FDI is induced by a trade orientation and itself promotes trade.<sup>24</sup> First FDI, whether in manufacturing, services, or resource extraction, generally produces positive outcomes for the country even when spillovers are modest through competition and linkage effects.<sup>25</sup> On balance, it generates more productive and better paid employment and is environmentally friendlier than similar investment by indigenous producers (World Bank 1999). Second, FDI can augment the stock of skills, raise the level of technology, improve access to international markets and integrate countries into international production networks which are increasingly the locus of trade flows.

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<sup>23</sup> This associated with the growth of trade and controlling them as for instance by the U.S. in the mid sixties has proven difficult. See Garrett (2000).

<sup>24</sup> See World Bank (1999), Edwards (1999), Rogoff (1999) and De Gregorio et al (2000) on capital flows and their effects on stability and on the use of capital controls.

<sup>25</sup> See Markusen and Venables (1999).

Third, the salience of capital movements and their current fairly narrow ambit has drawn attention to the role of financial development. Openness can stimulate financial deepening, the creation and strengthening of institutions and the building of a viable regulatory infrastructure. But it is also the case, that countries which have made a strong start in building institutions and a regulatory framework are more likely to attract capital and minimize volatility (Easterly et al 2000).<sup>26</sup> An impressive amount of research shows that financial capability can add one to two percentage points to the annual growth rate as a result of increased allocative efficiency (Levine 1997). And financial backwardness compounds the growth retarding effects of barriers to openness. Higher growth rates can also reduce the likelihood of a country's growth momentum being sharply curtailed by an external shock.<sup>27</sup> Financial depth brings with it other advantages as well including the availability of equity capital permitting companies to diversify away from an excessive dependence on banks and to reduce corporate gearing ratios; and an increased supply of venture capital which facilitates the entry of new firms to fill the niches such as those created by IT and market integration.

The gains from a strong financial sector are independent of globalization. But a country which actively pursues financial development can reinforce domestic efforts and magnify the advantages of financial deepening by pursuing openness. For example, by increasing the presence of and the role played by foreign banks, a country can import best practice, inject more competition into the banking sector, and supplement its own regulatory oversight with that conducted by regulators in the home countries of the investing banks (World Bank 1999).

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<sup>26</sup> Bekaert (1999/2000) also does not find that financial market liberalization followed by capital flows leads to excess volatility. Nor does he find that such flows lead to an appreciation in real exchange rates.

<sup>27</sup> Easterly et al (2000).

While much has been written on measures to create an enabling environment for FDI in low income countries, and the growth promoting function of FDI is well recognized, less attention has been given to policy regimes which would maximize the financial sector's contribution to growth. Such a regime can have four ingredients. First, banks should be independent and preferably in private hands.<sup>28</sup> Where industrial policies direct lending to sectors favored by the government, the chances are that banks will neglect stringent credit and risk analysis, make loans on the basis of dubious collateral, acquire large amounts of non-performing assets and be regularly forced to rescue failing corporate clients.

Second, the efficiency and resilience of an independent banking system rests on the quality of rules governing capital adequacy, provisioning, transparency, auditing and managerial accountability. These rules are most effectively enforced by an autonomous public agency complemented by private, market-based monitoring and rating bodies. The two points are interlinked because an independent financial system derives credibility from an autonomous regulator able to define and enforce rules and is, therefore, likely to articulate the demand for regulatory autonomy (Posen 1993).

Third, policies to broaden financial markets and encourage the active trading of bonds and other instruments contribute to investment and stability. This calls for government initiative, especially in bond trading, encouragement to banks and other bodies to serve as fee-based market makers, attention to real-time settlement systems and the putting in place of credible and monitorable institutions. For many developing countries the solution may lie not in attempting to create a full suite of domestic markets

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<sup>28</sup> La Porta et al (2000) find that government ownership of banks slows financial development and income growth.

but to actively participate in a regional market of the requisite depth, that adequately serves the needs of an integrating regional economy.

Independent and competitive banking systems, financial depth and a credible regulatory infrastructure is the surest way for countries to participate in globalization while minimizing the risks. It generates a strong demand for macroeconomic stability; it can encourage longer term investment and thereby dampen volatility; it allows companies to achieve a more balanced capital structure; and it leads to the sophistication and skills required to handle crises with the minimum of external assistance.

Global financial markets will be the principal sources of capital for developing countries. Hence delaying integration has a high cost. In most instances, it induces countries to defer financial and regulatory change which would improve domestic resource allocation and contain the risks from external shocks. It prevents access to foreign resources which could finance investments and at the same time multiply the domestic financing options. Lastly, the vast majority of countries can no longer avoid de facto, creeping globalization. Whether or not they maintain capital controls, countries cannot easily regulate capital outflow<sup>29</sup>. And with the proliferation of derivatives, it is difficult to prevent inflows into markets perceived as desirable by investors.

Although the east Asia crisis has warned us that financial globalization can be a bumpy ride, it has also pointed to the factors responsible for the bumps.<sup>30</sup> The message to take away is that the policies and institutions can smooth out the bumps without eliminating all the risk. But the rewards from participation are clearly so large that

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<sup>29</sup> The massive and continuing outflow of capital from China underlines this point.

<sup>30</sup> Ikegami (1999) maintains that cyber-capital of the IT era is different from the global capital era and much more mobile. This arises from the “detached and disembedded relationship of cyber-capital to the object of investment. Cyber-space transactions breed a competitive short-term mentality in fund managers in contrast to the more conservative attitudes found among managers of global industrial capital.

developing countries should take the necessary steps. After all, investors are returning to the emerging markets and financial transactions are on the rise lured by the promise of reforms in some east Asian countries as well as the commitment of most countries to openness.<sup>31</sup>

### **The Role of Migration**

While much of the work on globalization has focused on trade and capital flows, research on endogenous growth and on economic geography is highlighting the significance of migration and its association with trade and capital movements. During the first phase of globalization, in the late nineteenth and early twentieth century, long distance migration paralleled trade and capital flows. In fact, over 60 million people emigrated mainly to the Americas between 1850 and 1912. During the 1880s, immigration added 0.5 per cent annually to the population of the U.S. and Canada and 1 per cent to that of Argentina (Faini et al 1999). But by the mid 1920s, migration

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<sup>31</sup> The experience of East Asia during 1997-99 has shed light on the impact of shocks on the low income groups in the community. The initial results are ambivalent on three counts. First on the magnitude of the shock for wage earners second on the extent to which the poor – and especially the majority who live in rural areas were affected by the crisis. Second by the efficacy of short term remedial measures taken to cushion the urban unemployed against the shock. Survey data from Southeast Asian countries indicates much of the impact was on real wages and not on employment or hours of work. However, there was a cutback in employment in the finance, construction and transport industries (Fallon and Lucas 2000). Data gathered in Indonesia shows that the headcount index of poverty rose during the first half of 1998 – in large part because of high inflation – but that the bounce back has been significant – so that overall, the poverty jumped by less than was expected in South-east Asia (the urban poor were the most hard hit, with rural dwellers being partially cushioned by own production and home ownership, See Levinsohn et al 1999) and a return to normalcy, spearheaded by export growth, has also been quick. If anything, the middle class was worse hit than the poor and their concerns are likely to have a larger bearing on future course of policies towards openness and safety nets. There was an unemployment spike in the most seriously hit countries which was ameliorated in part by migration to the rural sector and by food for work programs in Thailand and in Indonesia (Booth, 1999).

had dropped to a trickle and it only began to revive in the second half of the century.<sup>32</sup> During the past two decades, the tempo has risen with between two and three million people migrating each year to some 67 major receiving countries among which the US, Canada, Germany and Australia are the most prominent (*Oxford Analytica*, International Migration, April 25, 2000). Currently about 120 million people live outside the countries of their birth and their numbers are rising by close to 2 percent per annum. In three regions – North America, Western Europe and Oceania – one in every thirteen inhabitants is foreign born. It is the growth in their numbers which is responsible for much of the population increase in North America and Oceania. It also serves to stem the shrinkage of populations in Western Europe.

There are those who believe that the growth of trade, the communications revolution and the rise in FDI will dampen migration. There is some truth to this. Research on migration during the early period of globalization suggests that capital movement can substitute for migration and serve to narrow factor price differentials (Williamson 1998). But it can also be shown that capital movements can widen differentials and even promote migration. Similarly, both theory and empirical findings on the relationship between trade and migration yield equivocal results (Faini et al 1999). Furthermore, advanced telecommunications facilities, together with the Internet, are transferring semi-skilled and skilled jobs from advanced to developing countries. In time this process could whittle away the wage gaps for certain types of skills, diminishing one of the principal motivations underlying migration. Reinforcing these essentially positive factors, that could weaken the urge to migrate, is the growing resistance to migration in

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<sup>32</sup> Each surge of migration aroused resistance from workers and artisans who felt their wages threatened by the newcomers. For a discussion of the reaction to immigration in mid nineteenth century U.S. See Ferrie (1999).

some of the major receiving countries, where the laws deterring entry are becoming increasingly more strict (Faini et al 1999).

Against this view, which foresees a decline of labor market globalization, is the perspective provided by research on demographics, pace of income convergence, the clustering of knowledge-based and cultural activities, the emergence of emigrant diasporas and the availability of faster and cheaper transport links. Demographics points to the pressures generated by highly divergent rates of population growth in different regions. In Europe, Japan and even the U.S., the fertility rates of the indigenous populations will result in rapid shrinkage and aging. This will have far-reaching effects on growth, technological dynamism, the availability of services and the quality of life.

At the same time rapid population growth particularly in north Africa, the Middle East – where the average age is 16 - and south Asia will give rise to pressures to migrate, even if the availability of jobs in these regions becomes more abundant, because the size of cohorts in the working age groups will be large. Indications are that countries faced with declining populations will adjust their institutions and practices to accommodate increased emigration.<sup>33</sup> Demand from employers will also result in both legal and illegal migrant flows as has been the case in the U.S. (*Oxford Analytica*, Immigrant Labor, February 17, 2000; Espanshade 2000; and Faini et al 1999).

Migration is advantageous for developing countries in several respects. First and foremost, migrants send back remittances amounting to \$75 billion, far in excess of the \$52 billion of overseas development assistance (ODA). This eases foreign exchange constraints on growth, and a sizable part of the flow goes to the poorer families which

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<sup>33</sup> However, estimates by the UN (ECOSOC) indicate that migration adequate to maintain the ratio between the 15-64 age group and the above 65 age group would require unacceptably high levels of immigration.

helps to reduce the skewness in household consumption. Second, the opportunity to work in the industrialized countries is a valuable source of skills and experience. For those with high-order technical skills, interaction with leading researchers in the competitive environments of the industrialized countries, enhances productivity and innovativeness. About 38 per cent of the work force in Silicon Valley is of Indian origin. What starts out as “brain drain” – a worry and concern for governments<sup>34</sup> - can be turned into “brain gain”,<sup>35</sup> accompanied by financial resources, if developing countries pursue openness and integration with the international economy. The reflux of highly trained scientist-entrepreneurs to Korea, Taiwan (China), China, India and other South-east Asian countries is largely the result of business-friendly institution building and outward orientation. There are signs that the positive – sum aspects of migration are being recognized by western countries who are relaxing restrictions on immigrants with desirable skills even as the political mood against lower skilled workers remains inflexible.<sup>36</sup>

Third, migration is the basis of international networks which, in a globalizing world, can be the keys to industrialization and commercial success. These networks also stimulate continuing flows by providing prospective migrants with worldwide contacts. Diasporas can be “trade creating” because they reduce transactions costs by providing

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Hence, even if levels of immigration rise populations of developed countries may still decline. *Oxford Analytica*. Migration Flows, April 26, 2000.

<sup>34</sup> India worries that it will not be able to fill its requirements for 2.2 million IT workers in 2008 if immigration continues at the current pace. *Financial Times* “India’s plan to plug the brain drain”, April 24, 2000.

<sup>35</sup> China has systematically pursued a strategy of sending large numbers of students and mid-career professionals abroad to train since the early 1980s. Financing was provided by the state, IFIs and foreign universities. To ensure that a high proportion of the trainees returned, considerable effort has gone into keeping links with the home country intact and imbuing those studying abroad with a sense of nationalism. However, only a third return although the numbers could increase as opportunities and incomes become more attractive (Engelsberg 1995).

<sup>36</sup> *Financial Times*, “Skills without frontiers”, April 25, 2000; *Economist*, Europe’s Immigrants, May 6<sup>th</sup> 2000; and *Financial Times*, “The Foolishness of tinkering with immigration” April 25, 2000.

mechanisms for enforcing contracts when formal legal institutions are weak or lacking, by pooling information, and by creating a supply of intermediaries with a deep knowledge of particular countries that allows them to match buyers with reliable local suppliers. Contract enforcement depends upon trust arising from dense ties which serve as relays for the exchange of information, create a moral community and are a means of monitoring behavior, and meting out punishment when trust is breached. In tightly knit and successful diasporas, a member who cheats or fails to fulfil a contract risks ostracism by the entire community and irreparable damage to his reputation. For hundreds of years this simple rule has enabled trade diasporas to flourish using trust in lieu of a legal system (Rauch 1999, Zak and Knack 1996). The descendants of the Maghribi traders from the late middle ages are the present day Chinese, Indian and Hausa networks.

The Overseas Chinese diaspora, which commands a huge volume of capital and can draw upon detailed market information as well as a wide range of expertise, has contributed significantly to the growth of south-east Asian economies. Similarly, as India has liberalized its economy, the overseas Indian community has become far more active in launching business ventures in the subcontinent and supporting the development of skills for ICT and high tech industries.

Other regions, such as Sub Saharan Africa (SSA), have drawn much less on their human resources in the industrialized countries. Some 30,000 Africans with doctoral degrees and 250,000 with advanced technical qualifications work in Western Europe and North America. This is a large pool of talent many with business connections and access to capital which could stimulate progress in SSA. But Asian experience shows that a diaspora can become a potent instrument for development only after countries are prepared to open their economies, lower the barriers to trade and capital flows and begin

enforcing legal and commercial rules critical to a dynamic economy. Networking among the highly skilled members of overseas communities also influences their capacity and willingness to contribute to their countries of origin. Absent these steps, the opportunities appear meagre and the risks excessive.

For many developing countries migration is likely to be vital as a safety valve, enabling workers to find better paid employment abroad; a source of remittances, of skills, technology and capital; and a means of becoming a part of international production networks. In some countries, the desire on the part of young people to emigrate is the principal incentive to acquire useful skills and serves to maintain standards in segments of the educational system.

For many developing countries this aspect of globalization is highly advantageous. But to fully exploit the longer term benefits from migration and the growth of diasporas, countries must not only participate in the making of international institutions to manage and facilitate labor mobility but they also need to see migration as part of a larger process of opening and integrating their economies. This is how dynamic gains can be more fully realized, to complement the flow of remittances. In fact, such action might also be necessary to provide leverage in arriving at global rules covering migrants which are viewed as fair by all parties.

### **Urban agglomeration in globalizing world**

A world in which resources move easily and incentives to trade are stronger is likely to lead to a coalescence of economic activity in favored urban locations with a pro-trade bias and receptive to FDI.<sup>37</sup> This appears to be the trend in recent decades despite falling transport and communication costs which would support a deconcentration of production.<sup>38</sup>

There are two tendencies at work which need to be disentangled. One is urbanization driven by a variety of factors including rising incomes,<sup>39</sup> labor saving agricultural technology,<sup>40</sup> relative prices,<sup>41</sup> the changing structure of demands, agglomeration economies and the ease of supplying a desired mix of services more cheaply in urban locations. It has effected the transfer of workers from low productivity occupations in the rural sector to more productive jobs in industry. In the case of China it has contributed nearly 10 per cent to overall growth between 1980-1998, in part because labor redistribution has been paralleled by high investment<sup>42</sup>. This process has been ongoing for well over a century and is not necessarily linked to globalization. In fact, when projections from the 1970s are compared with actual outcomes, urbanization has proceeded less rapidly than was envisaged even as the world has become better integrated.<sup>43</sup>

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<sup>37</sup> Lamorgese (1999) finds that in large cities with a diversified economic base, incomes are less volatile. Also in well managed cities, growth need not result in declining returns. However, as Krugman and Elzondo (1996) show, openness is likely to lead to a decline in the primacy of capital cities, which enjoy an advantage in the earlier stages of development because of the presence of government agencies.

<sup>38</sup> Economic regions can be the result of “first nature” advantages such as resource endowments or transport facilities. They can also emerge because of “second nature” effects when the location of some key firms pulls in others to create a dense networked agglomeration propelled by scale economies and spillover effects. (Schmutzler 1999).

<sup>39</sup> There is a close correlation between urbanization and per capita GDP. Using logs the coefficient is 0.85. (Henderson 2000).

<sup>40</sup> Feinstein (1999).

<sup>41</sup> Williamson (1984).

<sup>42</sup> See Poirson (2000).

<sup>43</sup> Brockerhoff (1999).

Of greater interest from the perspective of globalization is the formation of dynamic economic regions which thrive in the open trading environment created by globalization (Scott 1998). Where they have emerged, these regions have become centers 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 weave networking relationships 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 (Gasper and Gleaser 1999). Two earner families comprised of partners with higher order skills also find that large and dynamic cities are more attractive because they permit both husband and wife to pursue their separate careers.

Two decades ago there were a mere handful of these regions most notably in the U.S., Germany, and Italy. And although the term industrial districts, coined by Marshall, was part of the lexicon, the analysis of clusters, of networking and of social capital was still in its infancy. It was globalization that provided the nudge by inducing regional clusters in other parts of the world and providing strategically located areas with latent advantages to build an industrial base, often with the help of FDI.

The road from potential agglomeration effects to thriving economic regions is by no means well sign-posted and “production space has become increasingly slippery as the ease to capital of moving plants grows and as new competing lines are set up in lower cost regions elsewhere” (Markusen 1996, p. 293). However, the experience of countries such as Brazil, India, China, Malaysia, Korea and Mexico helps to identify some of the ingredients responsible for virtuous spirals.

Proto-industrial traditions matter but even where these do not exist, government policy with public funding can bring into existence a research-cum-industrial complex which strikes deep roots (Marshallian district)<sup>44</sup> In other cases a large domestic or foreign firm can trigger a dynamic which draws in a network of supplies to form a viable cluster with robust networking arrangements (hub and spoke districts). The presence of universities and research centers capable of supplying skills, ideas and consulting services, is an additional asset as is the presence of producer service providers e.g. financial, supply chain management, and marketing. A government financed, military industrial complex provided the seeds for cluster formation around Bangalore in India (state sponsored districts). Venture capitalists have helped Silicon Valley flourish, while supply-chain management and other value-adding services that enhance the competitiveness and profitability of manufacturers have secured Hong Kong's position as the hub of the manufacturing industry in the Pearl River Delta Region (Berger and Lester 1997). The list of contributing factors can be extended, but a closer look at the recent history of these dynamic clusters suggests the importance of outward-orientation validated by policies towards trade and FDI. All of the major economic regions in low or middle income countries are heavily urbanized and draw their strengths from a few key export activities supported by transport and communications infrastructure linking them tightly to their main markets. Trade is the life-blood of these regions and globalization is providing them with the unparalleled opportunity to extend their reach.

In most developing countries, a small number of cities - with the capital city in the lead - generate half or more of the GDP. In a globalizing world, chances are that a few interlocking metropolitan areas comprising an economic region could become the

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<sup>44</sup> See Simmie and Sennet (1999).

principal “growth pole” for countries fortunate enough to acquire clusters of internationally competitive industries. 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. In any event, the rising importance of such agglomerations poses three kinds of policy challenges for developing countries. First it requires central governments to pursue a mix of trade and macroeconomic policies supportive of outward-oriented industrial regions. Second, by shifting some of the locus of decision-making to the emerging and economically powerful subnational entities it calls for coordinated action by central and metropolitan governments to provide infrastructure and services to achieve and sustain a competitive edge in tradable items.<sup>45</sup> Third, states need to manage and minimize divergent trends in regional income levels by building political support for redistributive policies and implementing these efficiently in conjunction with measures to accelerate the development of lagging regions. The experience with regionally targeted policies is uneven and there are few clear success stories, nevertheless a combination of infrastructure building and services can, in certain circumstances speed up the pace of convergence.

Fourth and finally, regions that straddle several counties would benefit from good interjurisdictional coordination so that scale economies and spillovers can be adequately dealt with. Where regions embrace contiguous parts of several countries, coordination of macroeconomic, trade, spatial and other policies will determine whether regional integration tightens and the full benefits of clustering and agglomeration are realized.

### **A Tightening Web**

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<sup>45</sup> Privatization of utilities and a redesigning of rules to encourage greater private sector involvement is likely to determine the supply response and the productivity gains. The positive association between privatization and productivity in Mexico is analyzed by La Porta and Lopez-de-Silanes (1999).

Perhaps the decisive difference between the first and the current stage of globalization is the linkage afforded by computerization, coupled with the worldwide web. This is also facilitating trade in goods, enlarging trade in services and has moved capital flows to a new and higher plane. Computing capacity is expanding at a truly staggering pace. It is projected that by 2010, an average computer will have 10 million times the processing power of the machine available in 1975. Moreover, the world wide web took just 3 years from its launch in 1989 to reach a global audience of 50 million and Internet traffic is doubling every 100 days. By comparison it took the radio 37 years to reach a comparable audience and even television required 15 years (Coyle 2000). Enthusiasts are inclined to make excessive claims about how extensively the Internet will transform lives given that half of all the world's population have never seen a telephone or placed a call. Nevertheless, in a variety of areas, the web and communications technology can decisively influence development by way of globalization.

For the majority of developing countries the initial impact of the Internet will be on trade, information, and technology transfer. For a small but increasing number it is the prime mover behind the massive increase in financial transactions the flow of capital. This section concentrates on the trade and industrial effects of greater connectedness with the technological dimension dealt with in the section which follows.

For existing and potential producers in developing economies, the Internet can become a cheap and convenient source of information on market demand, a mechanism for securing contracts, for servicing clients, for purchasing items and for increasing the efficiency of the sales and payment process. It is reducing transactions costs, the

expenditure on inventories and warehousing, and opening the door to entirely new products many of which could be delivered online.

Most importantly for developing countries, the Internet lowers the entry barriers for small and medium sized firms which often have difficulty competing against larger established international producers. “One of the hallmarks of electronics commerce is that by drastically reducing transaction and search costs, it reduces the distance between buyer and seller, enabling business to target very small niches, develop individual customer profiles and essentially provide the means of marketing on a one-on-one basis” (OECD 1999, p.20).<sup>46</sup>

Future growth and employment in developing countries is mainly dependent upon small and medium enterprises (SME) and services, although agriculture will remain dominant in some regions. Their success depends on combining entrepreneurship with innovativeness,<sup>47</sup> entering relatively younger industries, from participating in a web of cooperative alliances, the synergy derived from their links with large firms and, because of globalization, their widening role on the international trading arena (Acs 1999). For the SMEs and service industries such as data processing and software, the Internet is multiplying market possibilities manifold. The rapid expansion of software providers in India, the Philippines and Brazil is directly correlated with the demands generated by computerization. Similarly better market access has been a major stimulus for SMEs in several countries in Eastern Europe, India, China and South-east Asia.

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<sup>46</sup> Business-to-business sales in Asia are expected to rise from \$2 billion in 1999 to \$32.6 billion in 2003. *Financial Times*, “Buyers and Sellers flock to Online Asian bazaar”. March 29, 2000.

<sup>47</sup> Acs (1999) observes that although SMEs spend less on research than large firms they produce almost twice as many innovations on a per employee basis.

The Internet can boost the prospects of developing countries and help them share some of the gains promised by the “New Economy”. But this will require countries to liberalize and adopt a variety of international rules and standards.

It almost goes without saying that a further lowering of trade barriers for goods as well as services is a necessary adjunct to a greater reliance on e-business. Moreover, countries will have to negotiate the rules governing electronic transactions and the taxation of products delivered over the net. The majority of countries lack the infrastructure, technical skills and language skills to use the net.<sup>48</sup>

Governments need to implement policies which will draw the private sector into ICT development<sup>49</sup> and channel resources into physical assets-telecommunication facilities and computerization<sup>50</sup> into the nurturing of skills, including English language skills, and in implementing international protocols on standards through public or private certification services. Once the returns are better appreciated, the process will become self-sustaining, but initially, governments must do some pump-priming, put in place the regulatory framework, starting with an independent telecommunications regulatory authority, and utilize demonstration effects to their fullest. Malaysia’s cybercity is a somewhat extravagant, and yet to be proven, example of how the activity might be initiated with major public sector inputs, although its eventual outcome is unclear. But the experience of Mauritius and Botswana suggest that the private sector is fully capable of providing utilities and infrastructure (Goldsmith 1999). With the technology evolving

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<sup>48</sup> On the development of the IT infrastructure in China, see Anderson (2000).

<sup>49</sup> In India, development of IT has been hampered because of the control exercised by government monopolies (Burkhart et al. 1998).

<sup>50</sup> Privatization of telecommunication facilities accounts for a third of the global total during 1988-98, and is at the forefront of privatization activity in developing countries. It is primarily responsible for lower prices, and improvements in the quality as well as the range of services. Keeping abreast of technological advances will require continuing heavy investment that only the private sector would be able to generate under the prod of competition and regulatory pressure (Megginson 2000).

at great speed, aiming for broad-band facilities, wireless access, satellite transmission, and machine translation (MT) software to overcome language difficulties (there are few Arabic search engines, Alterman 2000) is more likely to result in user-friendly services for businesses and upscale consumers.<sup>51</sup>

Openness does not eliminate the need for regulation of the Internet but it argues for minimally obtrusive intervention by the authorities and respect for individual privacy. In several countries the urge to control the content of material available through the Web, exercise surveillance and screen web flows is only partially effective but inhibits web use, reduces trust in the information offered by local providers and erodes the gains from the technology (Fandy 2000). Nevertheless, some rules will have to be set and enforced, which is one of the liveliest areas of debate.

An increase in business-to-business (B2B) dealings will also require much more effective mechanisms for certifying products, agreement on standards, and a high degree of harmonization among countries, itself a key facet of globalization. Furthermore, SMEs in developing countries will only become active participants in the world economy if the transport infrastructure and delivery services can enable them to pack, insure and ship on tight schedules. The modernization of transport infrastructure and delivery is proceeding slowly in many countries because regulation and/or state ownership impedes private investment and competitive operation. In a globalizing world, it is becoming easier to attract capital into long-lived infrastructure and in addition, there is emerging a

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<sup>51</sup> Currently 80 percent of Internet traffic is in English and English language skills are an important determinant of access. But by the end of 2000, the majority of users will not have English as their first language. MT is still at an early stage and successful translation requires restricting the domain of discourse, using AI to give the computer a rudimentary understanding of the topic being translated and incorporating syntactic and semantic rules ( *Wired* , Talking to strangers, May 2000). In the Middle East where per capita income average \$2000, Internet use in Egypt (with a per capita income of \$1300) is limited to 3 per cent of the population. In Oman only 1.6 percent have Web access. Monthly access fees averaging \$30 is one inhibiting factors (Alterman 2000).

body of good procedures for regulating transport and communication services. Adopting these would quicken the pace at which the Internet stimulates trade-oriented business activities in developing economies.

### **Technology Transfer in a Networked Environment**

Technological progress and technology transfer were ongoing long before globalization became a household word. But the communications revolution, rising literacy, the accumulation of skills and the growth of trade has the potential for drawing developing countries more extensively into the ambit of research in many fields most notably in agriculture which is crucial for welfare, food security, employment, resource mobilization, growth and foreign exchange earnings.<sup>52</sup>

Technological change has proceeded slowly in developing countries for a variety of well rehearsed reasons. This is a major reason for slow growth and the widening dispersion in incomes between rich and poor countries. The blame is placed on the weaknesses of skills, incentives, the educational system, research facilities, the business culture and traditions influencing the quest for new knowledge. With the best will in the world, transforming innovation systems is a slow process. To hasten the process, policy must provide a much stronger dose of incentives including the pressures introduced by greater openness (Michie 1998).

In the agricultural sector there is cause for optimism. And if agriculture can emerge or a leading sector, then this would strengthen growth prospects, increase food

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<sup>52</sup> Generating an agricultural surplus and using it to promote urban-industrial development will remain important for growth. See Winters et al (1998) on the role of prices in mediating this transfer.

security and diminish poverty in some of the worlds least developed countries.<sup>53</sup> Hope stems from three sources. First, the advances in genetic and transgenic technology has made it possible to engineer crops to cope with a wide range of environments. Plants are being bred to achieve better yields and to withstand, water stress, salinity, and high temperatures and to resist some of the common diseases and pests.<sup>54</sup> Monsanto has been selling bollworm resistant cotton to China since 1998. Transgenic technology has also enhanced responsiveness to fertilizer while lessening a plant's vulnerability to certain pesticides. Most recently the inserting of specific genes into food grains such as rice has enhanced their vitamin A content. Although the spread of genetically modified crops has aroused justifiable concerns, better regulation, greater care in the setting of appropriate standards for each type of bio-engineered component of a crop, appropriate labeling of foods, a deeper understanding of the technology, the closer involvement of developing countries in the setting of standards and a sharing of the research, can put to rest many of the fears.<sup>55</sup> Producers and consumers worldwide stand to derive enormous gains from the technological change sweeping through agriculture, especially the least developed countries which are often the ones most subject to water scarcity, soil degradation, pest outbreaks and climatic pressures.

The average per hectare yield of staples in SSA is well under a ton and yields of potatoes and maize are the lowest in the world. It is 1.75 in South Asia and 4 in east Asia

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<sup>53</sup> For the next 20 years, the worlds population will be growing by 73 million per annum almost all of it will be in developing countries. This will require a 40 percent increase in the supply of foodgrains by 2020, four fifths of which must be from higher yields (Runge and Senauer 2000).

<sup>54</sup> *Science*, "Hopes Grow for Hybrid Rice to feed Developing World", April 1, 2000, *New Scientist*, "Naturally Repellant", April 22, 2000. Florence Wambugu, one of Africa's leading plant geneticists, believes that "transgenics alone will [not] solve the problem. But it will lead to millions of tons of more grain...and could also st literally weed out poverty [in Africa]. *New Scientist*, "Feeding Africa", May 27, 2000 p. 40-41.

<sup>55</sup> *Science*, "Bioengineered Food-Safety and Labeling", 290, October 20,2000, and Unnevehr and Hirschhorn, 2000).

(*Economist*, Agriculture and Technology Survey, March 25, 2000). In all three regions, growth in yields is either stagnant or is rising more slowly than in the past. Bio-technology offers a way forward that can be a potent source of growth, distributional gains and nutritional improvement in developing countries which gear themselves to harness this technology. Between 1994 and 1998, the area devoted to transgenic crops worldwide grew from 4 million to 70 million hectares. In the U.S., 500 genetically modified plant varieties are available and 28 percent of the maize, soybean and cotton grown is genetically modified. GM varieties have also made large inroads in the area under corn and tomatoes. About 300,000 hectares of land in China were under transgenic varieties in 1999 and it is expected that half of all crops grown by 2010 will be GM strains including a substantial volume of rice and corn.<sup>56</sup> But so far, only a tiny fraction of land in SSA is under genetically altered strains. SSA is fifteen years behind the technological level of east Asia in 1994 and technology flows to the region are small because of differences in climatic zones and the complexity as well as the heterogeneity of cropping systems compared to the industrialized countries, where pure stands of corn or wheat are the rule. Thus more domestic research is necessary to push the region to a higher technological level and to pull-in foreign technology which could then trigger a round of spillover effects.<sup>57</sup>

Adopting new technologies and pushing outward the technology frontier requires a capable research and extension infrastructure and the active involvement of the business sector. Few of the low income countries have made much headway in utilizing or

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<sup>56</sup> Monsanto's deciphering of the genetic code for rice in 2000 and decision to share this information with researchers in all countries constitutes a big step forward for the introduction of GM crops. *Far Eastern Economic Review*, "Leap of Faith", April 20, 2000; *Financial Times* "Monsanto opts to work with the grain", April 11, 2000. Similarly the inventors of the Vitamin A enhanced golden rice have signed a deal with AstraZeneca to allow free access to farmers in developing countries. *Financial Times*, "Third World to be given GM rice". May 16, 2000.

extending agricultural technology by creating high quality, competitive and commercially oriented research entities. However, communications technology offers a better chance of sharing knowledge, of drawing researchers in developing countries into the mainstream, providing incentives for talented individuals to pursue agricultural innovation and deriving more commercial benefits from innovation. The knowledge gap in agricultural technology can be closed. Ease of access to the Internet is but one of the steps and arguably the smallest in moving towards the technology frontier. Strengthening the scientific culture and competitiveness of local universities, building biosafety regulatory capacity and enforcing rules to protect breeders rights are other important steps.

Local research and modern communications can improve farming practices and technological assimilation in middle and lower middle income countries starting with the larger, commercialized farms. One is to prevent the loss of fertilizer through leaching volatilization and denitrification, by ensuring that the right kind of fertilizer is applied at the appropriate time in measured amounts. Another is through optimal application of water using more capital intensive, pressurized systems e.g. drip irrigation and lateral lines etc, that permit better regulation of timing and quantity.<sup>58</sup> With two thirds of African countries and many others in the Middle-East affected by water security, the efficient pricing, conservation and use of water will be a matter of urgency.

Further into the future, precision farming, using global positioning system (GPS) satellites<sup>59</sup> to provide each farmer with exact information on the condition of his fields and guiding the activity of planting, nutrient application and harvesting, will boost

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<sup>57</sup> See Johnson and Evenson (2000).

<sup>58</sup> See Smil (2000)

<sup>59</sup> See *Spectrum*, "X marks the Spot, maybe", April 2000

efficiency yet more.<sup>60</sup> The Internet can also simplify purchase of inputs, especially bulk purchase by larger farms, reduce unit costs and provide cultivators with information on prices, market trends, longer term weather forecasts and financing.<sup>61</sup>

This is already spreading in the U.S. spearheaded by grain traders such as Cargill and equipment manufacturers such as Deere. The use of e-trading will take some years to filter into developing countries, but with judicious investment in the infrastructure, user friendly technology and skills they need not wait too long. Many more countries can begin to exploit the efficiencies to be gained from a wider, targeted use of the Net as broadband access becomes cheaper and technologies more user-friendly.

The modernization of farming is increasingly inseparable from globalization because wide and integrated markets provide the incentives to specialize and raise efficiency (Thompson and Cowan 2000). They can also change the perspective on food security and permit a superior allocation of resources. Globalization of the agro-food system is proceeding rapidly because of advances in molecular biology which are extending the range of many crops and allowing buyers to source from multiple regions. Food processing and preservation technology is facilitating handling and shipment. In addition, FDI has spawned agro-industrial enterprises comparable in scale and standardization to manufacturing entities. For example, the Japanese have invested heavily in Thai agriculture, starting in the 1970s and processed foods account for a third of manufactured exports from Thailand (McMichael 2000).

Trade in foodstuffs and fibre is a huge and expanding business. Those countries unwilling or unable to participate stand to lose heavily. Without integrating with the

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<sup>60</sup> *Economist*, Growing Pains: A Survey of Agriculture and Technology. March 25<sup>th</sup>, 2000.

<sup>61</sup> *Business Week*, E-I, E-I, E-farming May 1, 2000.

world market it will be much harder to absorb technology and make full use of the window opened by the global communications network.

For many low income countries, integration will involve overcoming two hurdles, domestic market constraints, and barriers to food exports related to farm lobbies and food security.

Liberalizing domestic markets, with due attention to the institutions which contribute to efficient functioning, is the first hurdle for policymakers to surmount.

A second hurdle is integration with the globalizing market for foodstuffs. Trade in cut flowers, vegetables, foodstuffs and tree crops has provided valuable opportunities for growth and it has served as a transmission belt for technology. Brazil is at the cutting edge of soybean and citrus technologies because they are major exports and commodities of commercial significance attracting a great deal of research. China, the world's largest producer of cotton, is also moving quickly to expand domestic research so as to adopt transgenic technology.

Developing countries need to engage in active negotiations so as to integrate with the international economy on terms which will give them the best possible trading opportunities in commodities in which they enjoy comparative advantages and promise the desired level of food security. (Runge and Senauer 2000). The Internet, internal market development and trade together can lead to the steady technological progress which has proven so decisive. Moreover, the liberalization of markets in SSA plus institutional protection of intellectual property rights, for example, would sharpen the incentives for research on transgenic technology applicable to sorghum, cassava and yams. It would also draw the international seed and biotechnology companies into mutually advantageous partnerships with local institutes and startup firms.

## Concluding Observations

Research on the sources of growth has identified a small number of factors of relevance to all countries, rich or poor. These are labor, human capital, capital investment R and D, technological progress and the increase in TFP arising from scale economies, agglomeration effects, externalities and institutions that secure rights and minimize transaction costs. Whether developing countries are able to substantially raise per capita incomes will depend on policies which address these variables. I have argued above that a comprehensive approach towards globalization, managed and abetted by good policies, can magnify the effects of growth promoting measures.

Returns from investment in skills are much larger in the richer technological milieu made possible by closer integration.<sup>62</sup> Trade, by enlarging markets reinforces the gains, and the option to migrate further augments the worth of skills. The divergence in incomes between the skilled and the unskilled, which is observable worldwide, clearly reveals how much more fruitful skills are under globalization.

A fifty percent increase in growth rates – or even a doubling – will demand a vast amount of capital embodying modern technology and the associated tacit knowledge to put it to best use. Much of this investment will be domestically generated over the longer term. However, low income countries will need time to raise domestic savings ratios and allocate funds via financial markets. FDI and portfolio flows- as well as inputs from migrants – can provide the capital some of the technology, and the stimulus to deepen domestic financial markets.

Openness, together with spatially neutral domestic policies and the scaling back of regulatory constraints on domestic business activities, can unleash the full force of agglomeration economies and networking externalities, inducing the emergence of industrial clusters in metropolitan regions. The dynamic introduced by the economic region is the surest recipe for inducing fruitful R and D which assimilates knowledge from other countries while providing the basis for indigenous technological advance. As indicated above, openness is likely to be the surest way for low income countries to tap into the technologies that will galvanize agriculture, the economic center of their economies.

Globalization is not a panacea. Under some circumstances it can increase the susceptibility of countries to shocks. It subjects states to disciplines and checks that circumscribe sovereignty. Although local cultural identities remain robust, certain tastes, consumption preferences and elements of lifestyle have acquired a universal currency. But there is little evidence that such homogenizing tendencies are on the rise given the strong reassertion of local identities (World Bank 1999). The experience of the preceding century, which is still fresh in our minds, teaches us that erecting barriers to the flow of goods, factors, information and ideas, was injurious to welfare and entailed a loss of freedom. Reversing globalization, even if it could be done, would be an enormous setback. Slowing international integration, while it might temporarily protect some groups from competition will often be purchased at high long term costs for the majority. Frequently the delay in opening the economy does not lead to reforms which strengthen vulnerable sectors or to the creation of safety nets to protect low income groups. Generally reforms are compelled and implemented by having to face a challenge head on.

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<sup>62</sup> Foster and Rosenzweig (1996) have shown that the returns from secondary and higher education in

The above discussion suggests that embracing globalization piecemeal and keeping in place a plethora of regulations would be highly inefficient. There is no research which convincingly makes the case either for delaying openness or for sequencing the various elements of openness. In fact, there appears to be a good case for embracing all the key elements of globalization together, while sequencing, where needed, the pace of integration in areas such as finance and trade.

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agriculture depend on whether the technological level can also be raised.

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