The Shape of the Division of Labour
Nations, Industries and Households

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1. The changing global economic landscape: the factors that matter

Jan Fagerberg

INTRODUCTION

The global economic landscape is changing. Asian countries – starting with Japan in the early post-Second-World-War period, followed by the ‘Asian Tigers’ a few decades later, and China, India and several others more recently – are becoming more economically and politically important, while the roles of other parts of the globe diminish.

Are these developments examples of a more general long-run trend towards eliminating the large differences in income and productivity that continue to exist between countries, what in economic jargon is called ‘convergence’? Unfortunately not. As an illustration of the long-run evidence on the matter, consider Figure 1.1, which covers more than 90 countries for a period of four decades (starting in 1960). The figure plots annual average growth of gross domestic product (GDP) per capita over the period (horizontal axis) against its initial level (vertical axis). Dashed lines represent sample averages (of growth and level of GDP per capita, respectively). In this way four quadrants emerge. The countries in the top left quadrant have a high initial GDP per capita level, but grow relatively slowly (hence, they ‘lose momentum’). In contrast, the countries in the top right quadrant continue to grow fast despite being relatively wealthy at the outset. These countries are ‘moving ahead’. The bottom right quadrant contains countries that were relatively poor to begin with, but that have been growing faster than the average. These are the countries that succeed in ‘catching up’. The least fortunate countries are to be found in the bottom left quadrant, representing initially poor countries that are growing slowly. Arguably, these countries risk ‘falling behind’ in the global economy.

It is clear from the figure that there is a lot of diversity in how countries perform. By closer inspection, however, it becomes evident that there is a higher tendency for countries to cluster in the bottom left and top right than in the two other quadrants. Thus, if there is a general tendency, it
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Source: Fagerberg and Srholec (2005) based on Penn World Table Version 6.1 (Heston et al., 2002).

Figure 1.1 Convergence versus divergence in GDP per capita, 1960–2000
points more in the direction of divergence than convergence in GDP per capita across countries. The countries that fall behind are overwhelmingly African in origin while those that move ahead are mostly from the Western hemisphere (for example, OECD countries). Those that succeed in catching up are mostly of Asian origin, including well-known cases such as Korea, Taiwan, Singapore and China.

The failure of most poor countries to improve their position in the global economy puzzles economists, and has done so for a long time. In fact, the classical political economists, from Adam Smith onward, were already concerned with this issue. Since they believed that capital accumulation was the source of economic growth, they tended to put the blame for such failures on impediments to capital accumulation, particularly regulatory hurdles. Such arguments are still central of course. Nevertheless, since at least the 1960s, when Robert Solow presented his neoclassical theory of economic growth (Solow, 1956), economists have known that the source of long-run growth in productivity and income is not capital accumulation, but improvements in our ability to produce goods and services and the knowledge (technology) that underpins it. Solow, at that time, was not concerned with how such improvements came about, but the standard view became that the development of such knowledge mainly occurred in advanced economies (and particularly in the USA) from which it gradually spread to the rest of the world. Since economists generally assumed that knowledge had strong public goods properties, diffusion was often seen as a relatively easy affair, providing poor countries with ample opportunities for catching up technologically and economically if they ‘kept their house in order’ – that is, emulate Western (or US) political and legal systems, allow markets to work (with minimal interference), promote free trade, and have a liberal policy stance with respect to foreign direct investments (FDI). This policy package became the cornerstone of, among others, the International Monetary Fund (IMF) and the World Bank’s policies towards developing countries. In the 1990s this approach came to be known as the ‘Washington Consensus’.

Today, however, this once very popular approach, at least among the Consensus promoters, is generally seen as discredited. The world simply does not seem to work that way. In fact, several countries that have succeeded in catching up during the last 50 years clearly did not adopt these policies. FDI, for example, played virtually no role in the spectacular catch-up by Japan and Korea, while governmental interference in the economy was very frequent (Johnson, 1982; Amsden, 1989; Wade, 1990). Moreover, it is difficult to deny the fact that several poor countries that have managed to get out of the low growth trap (and started to catch up) have political systems that are far removed from Western democracies.
China is, of course, the most obvious example, but there are several others. On the other hand, many poor countries, particularly in Africa, that have tried their best to adopt the policies described by the ‘Washington Consensus’ have failed to reap the growth bonus that was assumed to follow (Fagerberg and Srholec, 2005). Furthermore, research into the assumed positive ‘spillovers’ from FDI in the developing part of the world has generally failed to document their existence (Görg and Greenaway, 2004). Similarly, the evidence on the assumed beneficial effects of openness to trade for developing country performance is mixed at best (Rodrik et al., 2004; Fagerberg and Srholec, 2008).6

All this suggests that there may be something wrong with our understanding (or theory) of what fosters growth in the developing part of the world. In the next section, I discuss what I see as perhaps the most important mistake in the approach outlined above. I argue that the whole approach rests on a fundamental misunderstanding of the role that knowledge plays in growth and development. This flaw affects our analysis of developed countries as well, but has had particularly damaging effects on our ability to understand the challenges facing developing countries. It is argued that we need to broaden our approach to include not only knowledge creation but also the factors influencing its absorption and exploitation. This is, of course, not an entirely new idea. It is, for example, widely accepted in management and is also adopted by historians and other social scientists.7 Building on some of this work, I discuss ways to conceptualize and measure the factors influencing the ability of developing countries (and to some extent other countries as well) to exploit knowledge to their advantage. Drawing on recent research by Martin Srholec and myself (Fagerberg and Srholec, 2008, 2009), I show how such an approach may be implemented empirically in an analysis of why some countries make it (while others fail). In light of this research, I return in the final part of the chapter to the seemingly paradoxical finding in the literature that ‘openness’ does not seem to matter much for development.

**KNOWLEDGE AND DEVELOPMENT**

There is no lack of sophisticated analyses of knowledge in economics.8 For some reason, however, these insights seem to have failed to have a large impact on the literature on growth and development. Instead, a rather simplistic view has been dominant for a long time now, in which knowledge is portrayed as a so-called public good, that is, something people all over the world can use freely as much as they like, and which will benefit everybody, independent of where they live. The following remark by
Edward Denison – perhaps the most prominent analyst of international growth differences in the early post-Second-World-War period – is typical in this respect, ‘Because knowledge is an international commodity, I should expect the contribution of advances of knowledge [. . .] to be of about the same size in all the countries’ (Denison, 1967, p. 282). Add to this the now commonly shared view that knowledge is the most important source of growth and development, and one ends up with a paradox: if knowledge is so fluid, why isn’t the whole world developed?

To be able to consider this question in a proper manner, it is necessary to take one step back to what one knows about knowledge and its role in the economy. First, there is no such thing as a worldwide stock of homogeneous knowledge that flows across the globe at the speed of light. Rather, there are many different types of knowledge and knowledge holders. Not all knowledge is scientific, as the Nobel laureate Friedrich von Hayek pointed out long ago (Hayek, 1945). Much knowledge is practical and context specific (which does not make it less useful economically of course). Knowledge is widely distributed across actors and contexts. As Hayek repeatedly emphasized, it is totally impossible for any actor, be it a person or a firm (or even a government), to know ‘everything’ that may be relevant for the solution of an economic problem (what is often called ‘perfect knowledge’). In fact, even to identify what the relevant areas of knowledge are (and how these can usefully be approached) may be challenging. That is one of the main reasons why large, knowledge-intensive firms all over the world regularly devote substantial resources to such search activities.

Even when the relevant knowledge can be identified, is codified and easily accessible, there is no guarantee that the knowledge will be successfully transferred. The knowledge may, for example, be difficult to understand and absorb. Higher education – even a doctorate or a whole group of people with such qualifications – may be required. Hence, it is not sufficient to have access to knowledge; one must also have the necessary capabilities to understand, absorb and exploit it. Building such capabilities may be demanding, costly and time-consuming.

Moreover, humans do not reproduce themselves by consuming knowledge. What they consume are goods and services produced with the help of, among other things, knowledge. Producers of these goods and services cannot rely on only one type of knowledge. They need to be able to access, absorb, combine and use many different types related to, for example, finance, logistics, products, markets, production, and so on. Access to necessary resources, such as information and communication technologies (ICTs), transport, skilled labour, and knowledge about how to access, keep and exploit such things, is also crucial. Arguably, it is of little help to
be aware of the knowledge if you cannot get hold of the resources necessary to reap the potential benefits from exploiting it.

The knowledge about how to produce goods and services is normally called ‘technology’, and a commonly used term for the ability of a firm to acquire, hold and use such knowledge is ‘technological capability’. The term was coined by the Korean development economist Linsu Kim (1980, 1997). His analyses were based on lessons of how Korean electronics firms, such as Samsung, gradually upgraded from a passive role of implementing foreign technology to a more active role, before finally arriving at the forefront of innovation-based competition in the industry. Kim defined technological capability as ‘the ability to make effective use of technological knowledge in efforts to assimilate, use, adapt and change existing technologies. It also enables one to create new technologies and to develop new products and processes’ (Kim, 1997, p. 4). It has become common (see Romijn, 1999, for an overview) to consider three aspects of technological capability: production capability, investment capability and innovation capability. Production capability is the ability to produce efficiently and reliably. Investment capability is needed to establish and finance new production facilities. Finally, innovation capability is required to create new technology, for example, to develop new products or services that better meet the specific requirements of the market. Kim expected the requirements to become more stringent, in particular with respect to innovation capabilities, as countries climb up the development ladder. Thus, following this view, for a firm or country in the process of catching up, the appropriate level of technological capability is a moving target (Bell and Pavitt, 1993).

A related concept that has become popular in the literature on growth and development is ‘absorptive capacity’. In development economics, the term has been used for a long time, as referring to the ability of a developing country to absorb new investments in a productive way (Adler, 1965; Eckaus, 1973). As the role of knowledge for growth and development has become more widely recognized, however, the expression has come to be associated with the ability to absorb knowledge. Wesley Cohen and Daniel Levinthal, in an influential contribution (Cohen and Levinthal, 1990) defined it as ‘the ability of a firm to recognize the value of new, external information, assimilate it and apply it to commercial ends’ (p. 128). This definition is close to Kim’s definition of ‘technological capability’, and Kim (1997) uses the two concepts interchangeably.

Firms are not isolated islands. Their performances depend to a crucial extent on the characteristics of the environment in which they operate. Thus, a firm’s technological capabilities do not only depend on its own activities, but also on the capabilities of its customers, suppliers and
other firms and organizations with which the firm is in regular contact (Lundvall, 1992). Hence, although initially developed for analysis of firms, the technology capability concept may also be applied to networks (of firms and organizations), industries or countries. Sanjaya Lall, in a survey (Lall, 1992), emphasizes three aspects of ‘national technological capability’ as he phrases it: (1) the ability to muster the necessary (financial) resources and use them efficiently; (2) skills, including not only general education, but also specialized managerial and technical competence; and (3) what he calls ‘national technological effort’, which he associates with measures such as research and development (R&D), patents and technical personnel. He also makes a distinction between technological capabilities proper and their economic effects. These effects, he notes, also depend on the incentives that economic agents face, whether resulting from political decision making (for example, governance) or whether they are embedded in more long-lasting institutions (legal frameworks, for instance).

That the social, institutional and political characteristics of the environment in which a firm operates have a strong impact on its capabilities and performance is not a new insight. Already in the 1960s, Irma Adelman and Cynthia Morris pointed out, on the basis of an in-depth study of a number of indicators on development for a large number of countries, that ‘the purely economic performance of a community is strongly conditioned by the social and political setting in which economic activity takes place’ (Adelman and Morris, 1965, p. 578). This point was also emphasized by the economic historian Moses Abramovitz, who used the term ‘social capability’ to describe this aspect (Abramovitz, 1986). He defined it as:

> countries levels of general education and technical competence, the commercial, industrial and financial institutions that bear on the abilities to finance and operate modern, large-scale business, and the political and social characteristics that influence the risks, the incentives and the personal rewards of economic activity. (Abramovitz, 1994, p. 25)

By ‘social characteristics’, Abramovitz is referring (among other things) to the spread of honesty and trust in the population, which he holds to be important for the ability to exploit technological opportunities. In fact, it is widely accepted that such factors may matter for economic development. Kenneth Arrow, for example, pointed out more than three decades ago that ‘It can plausibly be argued that much of the economic backwardness in the world can be explained by lack of mutual confidence’ (Arrow, 1972, p. 357). More recently, the importance of these matters has been brought to the fore by Robert Putnam and other writers on ‘social capital’ (as they phrase it). This has contributed to a rapidly increasing body
The changing global economic landscape

of research on the role of social capital in development (Woolcock and Narayan, 2000). A central theme in the policy relevant literature on the subject has thus become what governments can do to support the creation of trust and strengthen constructive collaboration across different (social, political, religious, ethnic, and so on) groups.

Thus, the lessons from this are (1) that the generation of (firm-level) technological capabilities is a must for countries that wish to catch up, and (2) that the degree of success in this aim depends to a large extent on wider social, institutional and political factors (or framework conditions). While many would agree with these propositions, they might perhaps have doubts about the possibility to test these empirically in a rigorous manner. In fact, Abramovitz, who pioneered much of this work, was pessimistic in this regard. The next section will show, however, that the availability of indicators has improved a lot in recent years – not the least for ‘non-economic’ aspects of development – and recent research has made progress in dealing with these issues.

MEASURING CAPABILITIES AND THEIR IMPACTS

How can technological and social capabilities be measured (if at all)? Figure 1.2 lists the main dimensions of reality pointed to by these two concepts, along with possible empirical indicators.

As discussed above, the concept of technological capability refers to the ability to develop, search for, absorb and exploit knowledge commercially. An important element of this is what Kim (1997) termed ‘innovation capability’. There are several data sources that capture different aspects of this. For example, the quality of a country’s science base, on which invention and innovation activities to some extent depend, may be reflected in articles published in scientific and technical journals. R&D expenditures measure some (but not all) resources that are used for developing new products or processes, while patents count (patentable) inventions coming out of that process. R&D data are not available for many developing countries, however. Patent data, on the contrary, are available for all countries. Nevertheless, many, if not most, innovations are never patented, thus, as for many other indicators, patenting gives only a partial view of what one wishes to measure.11

Another important aspect of technological capability mentioned by Kim (1997) is ‘production capability’. A possible indicator of this might be the adoption of quality standards (ISO 9000). Although ISO certification is mainly procedural in nature, it is increasingly seen as a requirement for firms supplying high-quality markets, and is therefore likely to reflect a
The shape of the division of labour

strong emphasis on quality in production. Moreover, although earlier studies such as Lall (1992) did not place much emphasis on capabilities in ICT, nowadays a well-developed ICT infrastructure must be regarded as a critical factor for a country that wishes to catch up. Arguably, this holds not only for production capability but also for the ability to innovate. Possible indicators reflecting ICT use may be number of personal computers, internet users, and fixed/mobile phone subscribers. These indicators are available for most countries.

The important role that a country’s financial system may play in mobilizing resources for catching up was pointed out already by Abramovitz, who included this as one aspect of social capability, and Kim, who saw it as an element of technological capability (so-called ‘investment capability’). Both attached a qualitative dimension to this that is difficult to measure with the available data. What can be measured is the (quantitative) development of the financial sector of a country, for example, as reflected in the amount of credit (to the private sector) or by capitalization of companies listed in domestic capital markets.

A different set of factors, emphasized, for example, by Abramovitz and Lall, relates to education and skills. Abramovitz and Lall were especially concerned about specialized managerial and technical skills. This is again,
however, an example of a type of information that is hard to get, particularly for a broad sample of countries at different levels of development. For most countries, more basic education statistics are available, such as the literacy rate, the teacher–pupil ratio in primary schools, and the rates of enrolment in secondary and tertiary education.

With respect to political characteristics, governance and institutions – furnishing economic agents with incentives for creation and diffusion of knowledge – are generally acknowledged as being of high importance for development. Although such factors often defy ‘hard’ measurement, especially in a broad cross-country comparison, there exist some survey-based measures, often collected by international organizations, which may throw some light on these issues. For example, there now exist survey data reflecting how widespread corruption is conceived to be, the extent to which law and order prevails, the independence of the courts, whether (intellectual) property rights are enforced, how easy it is to set up and operate a business, and so on. All these aspects are potentially important for innovation and may, to some extent at least, be achieved within different political systems.

Nevertheless, the impact of government’s actions on innovation activities and development outcomes may – as pointed out by Abramovitz, Putnam and others – also depend on social characteristics, such as tolerance, honesty, trust and civic engagement. The argument that social factors of this type may matter for economic development is, as mentioned above, widely accepted. The problem is rather how to measure such factors. One possible source of information that has been exploited to throw some light on the issue is the ‘World Value Survey’. Stephen Knack and Philip Keefer (1997) used such data to analyse the relationship between trust, norms of civic behaviour and membership in groups on the one hand, and economic growth on the other, for a sample of 29 (mostly developed) countries. The limited time and country coverage of these data has until recently precluded its extension to a sizeable part of the developing world. This has improved a lot, however, over the last few years. I shall return to this issue in the next section.

Openness (or interaction) across country borders is often taken to facilitate technology transfer (spillovers) and stimulate innovation. This issue is particularly emphasized in work inspired by the ‘new growth theories’ (Grossman and Helpman, 1991; Coe and Helpman, 1995; Coe et al., 1997). The applied literature on the subject has mostly focused on four channels of technology transfer across country borders: trade, foreign direct investment, migration and licensing (for overviews see Cincera and van Pottelsberghe, 2001; Keller, 2004). Some of these data sources are nevertheless in scarce supply for developing countries.
Given the relatively large number of potentially useful indicators, there is a lot of information to exploit when attempting to use these data to measure the various capabilities identified in the literature. One of the key challenges is how to combine this rich information into a smaller number of dimensions (for example, capabilities) with a clear-cut economic interpretation. The most widely used approach to construct composite variables is to select relevant indicators and weigh them together using predetermined (usually equal) weights (Archibugi and Coco, 2005). The problem in this case is that the choice of weights tends to be arbitrary. An alternative approach, pioneered by Adelman and Morris (1965, 1967), uses so-called ‘factor analysis’ (Basilevsky, 1994) to advise on such questions. This method is based on the very simple idea that indicators referring to the same dimension of reality are likely to be strongly correlated, and that one may use this insight to reduce the complexity of a large data set (consisting of many indicators) into a small number of composite variables, each reflecting a specific dimension of variance in the data.

Fagerberg and Srholec (2008) used factor analysis on data for 115 countries and 25 indicators between 1992 and 2004. The analysis led to the selection of four principal factors, jointly explaining about three-quarters of the total variance of the set of indicators. The first (and quantitatively most important) of these factors loads highly on several indicators associated with ‘technological capability’, such as patenting, scientific publications, ICT infrastructure, ISO 9000 certifications, and access to finance. The first factor, however, also correlates highly with education, so it cuts across the distinction in the literature between ‘technological’ (Kim, 1997) and ‘social’ capabilities (Abramovitz, 1986). Fagerberg and Srholec suggest interpreting it as a synthetic measure of the capabilities (or ‘factors’) influencing the ‘development, diffusion and use of innovations’, quoting Edquist (2004)’s definition of an innovation system (hence the name ‘innovation system’ for this factor). Figure 1.3 plots the innovation system factor score against GDP per capita for the countries covered by their investigation. The graph shows that there is a very close correlation between the ‘innovation system variable’ and economic development as reflected in GDP per capita. The deviations from the regression line primarily come from a group of resource-rich economies (Organization of the Petroleum Exporting Countries [OPEC] for instance), having slightly higher GDP-per-capita levels than the quality of their innovation systems would indicate, and some of the former centrally planned economies for which it is the other way round.15

The second factor identified by Fagerberg and Srholec loads high on various aspects reflecting the quality of ‘governance’, such as adherence to property rights, a well-functioning judicial system, low corruption and a
Figure 1.3  GDP per capita and innovation system (2002–04)

favourable environment for business. As in the previous case, this factor score correlates positively with the level of economic development. The third factor, in contrast, loads particularly high on indicators reflecting the character of the 'political system'. Countries with political systems that are close to those of the Western world rank high on this dimension, while countries with systems that differ from Western democratic ideals get a low mark. In contrast to the two previous cases, however, the character of the political system is not closely correlated with levels of development. The same holds for the fourth factor identified by Fagerberg and Srholec, reflecting the degree of 'openness' to trade and foreign direct investment.16

The finding that economic development and capability building go hand in hand is suggestive. But correlation, it may be noted, is in itself no proof of causation, and since many of the relevant data sources used to measure capability building have existed only for a few years (and in some cases for a single year only), there is limited scope for causality testing. Nevertheless, Fagerberg and Srholec (2008) provide some evidence (in the form of multivariate tests), summarized in Table 1.1, supporting the proposition that capability building affects development positively. The period covered by the investigation was 1992 to 2004. In the first test included in the table, the capabilities (factor scores) from the beginning of the period are regressed against the level of development as measured by GDP per capita at the end of the period. While the innovation systems and governance factors were found to be significantly correlated with the level of development one decade later, the same did not hold for the character of the political system and openness to trade and foreign capital. This is consistent with the results referred to above (see Fagerberg and Srholec, 2008).

Can the implications from the above analysis be sustained in a dynamic framework? Many contributions to the empirical literature on cross-country differences in growth performance, despite theoretical differences, share a common empirical framework. So-called Barro regressions (Barro, 1991) consist of regressing initial GDP per capita and a number of other factors that may be deemed relevant against economic growth. In this framework, the GDP per capita variable measures the potential for catch-up (or convergence), while the other variables represent factors that are assumed to 'condition' the ability to exploit this potential. The second column in Table 1.1 reports the results of such an exercise with the initial levels and changes in the capability measures identified by Fagerberg and Srholec as conditional variables. The results are very similar to those obtained for levels: while both the levels and changes in the innovation system and governance factors seem to affect economic growth
The changing global economic landscape

Table 1.1  Capabilities and GDP per capita

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<td>0.89 (3.39)**</td>
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<td>Innovation system</td>
<td>0.85 (18.14)**</td>
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<td>0.56 (2.07)*</td>
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<td>Δ innovation system</td>
<td>0.48 (4.67)**</td>
<td>0.30 (2.55)*</td>
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<td>0.16 (3.35)**</td>
<td>0.39 (2.68)**</td>
<td>0.43 (2.34)*</td>
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<td>Δ governance</td>
<td>0.38 (3.87)**</td>
<td>NS</td>
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<td>Political system</td>
<td>−0.04 (1.08)</td>
<td>0.07 (0.57)</td>
<td>0.34 (2.71)**</td>
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<td>Δ political system</td>
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<td>Openness</td>
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<td>0.07 (0.64)</td>
<td>0.37 (3.12)**</td>
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<td>Δ openness</td>
<td>0.03 (0.20)</td>
<td>NS†</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.90</td>
<td>0.30</td>
<td>0.73</td>
</tr>
<tr>
<td>Observations</td>
<td>115</td>
<td>115</td>
<td>57</td>
</tr>
</tbody>
</table>

Notes:  *, ** denote significance at the 5 and 1 per cent level, respectively. Standardized variables were used in the estimates (beta coefficients reported). The absolute value of robust $t$-statistics are in brackets. The capabilities (independent variables) are the lagged levels (factor scores) from the period 1992–94, while the changes in these capabilities are the differences in the levels (factor scores) between 2002–04 and 1992–2004. † NS = not significant.

Source: Based on Fagerberg and Srholec (2008), Tables 3–4.

favourably, there is very little support for the same in the case of the character of the political system and openness to trade and foreign capital.17

Capability building may also be influenced by long-run factors related to the history of the country (Acemoglu et al., 2001, 2002), its geography or natural resources (Gallup et al., 1999; Masters and McMillan, 2001; Bloom et al., 2003; Alesina et al., 2003; Sachs et al., 2004). Failing to take this into account may lead to biased inferences (with respect to policy, for instance). Fagerberg and Srholec (2008) found that unfavourable factors related to history, geography and natural resources did indeed influence the possibility of developing a well-working innovation system in a negative way. They pointed to this as an argument for continuing development
aid, because it confirmed that some countries are much worse off than others for reasons beyond the control of people living today.

Nevertheless, the results reported in Fagerberg and Srholec (2008) also suggest that the estimated impact of the openness and political system variables may be sensitive to the composition of the sample and selection variables. The last column in Table 1.1 reports what happens if half of the sample (the poorest countries) is left out of the investigation, while a number of assumedly unfavourable factors related to history, geography and natural resources are added. The most striking difference compared to the full sample is that in this case the political system (degree of Westernization) and openness to imports and foreign capital seem to have a positive impact. Thus, it is primarily among the richer countries that the character of the political system and openness to trade and FDI matter for economic performance; for the poor part of the world, the evidence is much less convincing.

WHAT IS THE ‘OPENNESS’ THAT MATTERS?

The finding presented above – also corroborated by other recent research\(^ {18}\) – that differences in openness do not discriminate between developing countries that make it and those that fail, requires further questioning. It undoubtedly runs against the intuition of many economists and may thus be seen as surprising. Note, however, that following traditional economic theorizing on international trade, differences in openness to trade should not necessarily be expected to have long-run growth effects. Although improved access to trade may give room for increased specialization and, hence, improved productivity, this is essentially supposed to be a once-and-for-all effect (Robson, 1987). Similarly, although traditional growth theory would posit that investment is good for growth (Solow, 1956), it would not really matter where it came from.

The theoretical basis for assuming a positive impact of openness – particularly with respect to trade and FDI – on growth rests, as pointed out earlier, much more on the so-called ‘new growth theories’ developed by Paul Romer and others from the 1980s onward (Romer, 1990; Aghion and Howitt, 1992). These theories depart from the traditional focus in economic theory on factor accumulation, replacing it with knowledge as the most important driver of economic growth. From this perspective, openness to trade and FDI may be of importance if they have effects on knowledge flows. To what extent that is the case is a matter of controversy, as pointed out in the introduction of this chapter. As for trade, there are some reasons to believe that it might affect knowledge flows positively.
This, however, is arguably only one among several possible channels for such flows, and probably, given recent advances in telecommunications and the internet, not the most important. Regarding capital flows, and FDI in particular, the evidence seems to suggest that the knowledge flows associated with such investments are not very extensive in developing country environments. It appears that the extent of such flows depends much on the sophistication of the environment at the receiving end, which implies that it is in the developed countries that such flows matter most for knowledge transfer (for an overview, see Fagerberg et al., 2010). This is consistent with the findings discussed in the previous section.

As emphasized above, it is thus not enough to have access to ideas. One also has to be able to exploit them. So even if, say, trade and FDI open up possibilities for access to knowledge, this may not matter much for development if the capacity to exploit those opportunities is not sufficiently developed. This is the most likely explanation for the failure of most developing countries to profit from the opportunities generated by the progress of the global knowledge economy. Arguably, one might relate this lack in capacity to lack in ‘openness’, but in a more fundamental way, such as the openness to new ideas, people carrying those ideas, and so on.

In an attempt to throw some light on these matters, I will now discuss three types of openness (other than trade and FDI) that may be important for development. The first is openness to ideas, for example, the ability to identify, access, implement and develop knowledge. This type of openness is related to the ‘technological capabilities’ emphasized by Kim and others. As discussed above, however, the openness of society to entrepreneurs carrying new ideas also has to do with the character of institutions, governance and values in each country – the type of issues, for example, that Abramovitz subsumed under the heading ‘social capabilities’. In exploring this issue, I find it useful to distinguish between openness to business and openness to people. The former refers to how new business initiatives (and existing ones too) are treated by the system of governance in the country. The latter, openness to people, has to do with the extent to which people with different characteristics (origin, gender, sexual orientation, and so on) are offered equal opportunities in the economic sphere and are able to work together. Arguably, a society that for some reason discriminates against a large part of the talent pool of its population will be at a loss when it comes to development.

Richer data than those underlying the discussion in the previous section are needed to explore the interrelationships between these three aspects of openness and development, in particular when it comes to social values. Drawing on Fagerberg and Srholec (2009), I will therefore focus on a more limited sample consisting of 75 countries, the majority of which are low
or medium income. Since the time series for many relevant indicators are short, the focus here is on recent evidence, indicating that it is difficult to discuss causality on the basis of these data. In each case a number of relevant indicators were identified. These were then weighed together through factor analysis. An advantage of this method in the present context is its capacity to test the extent to which indicators allegedly reflecting the same dimension of reality are in fact strongly correlated. The results of this exercise are illustrated in Figures 1.4 to 1.6, which in each case plot the relevant factor score against the level of economic development (GDP per capita). The figures also include the results of the relevant factor analysis including the indicators/variables used in each case.

Openness to ideas is assumed to depend on the quality of a country’s science base, as reflected in publications in scientific journals, international patent applications (PCT), R&D expenditure, advanced training (as captured by enrolment in doctoral programmes), science and engineering (S&E) education, the share of professionals and technicians in employment, use of quality standards (ISO) and trademarks and, finally, access to a state-of-the-art ICT infrastructure. The result, reported in the upper left quadrant of Figure 1.4 shows that all indicators taken into account by the analysis are strongly correlated with the resulting measure. The figure also plots openness to ideas against GDP per capita (in terms of purchasing power parity [PPP]) for the countries included in the analysis. The correlation is very close indeed: about 85 per cent of the variation in GDP per capita may be ‘explained’ by differences in openness to ideas.

Openness to business, in contrast, reflects how easy it is to set up (or close) a business or to protect intellectual property rights (IPRs) if law and order is adhered to; it also shows the extent to which corruption is a problem. This may be said to reflect the ‘innovation friendliness’ of governance in a given country. As shown in Figure 1.5, this type of openness is also strongly correlated with economic development. This also holds for openness to people, which is a measure of the openness of society to people with different characteristics (origin, gender, sexual orientation), the degree of trust among the citizens and their willingness to participate in civic activities (such as signing a petition). Note that the countries with the highest recorded values for these aspects of openness are not the ones usually found in such comparisons, such as the United States or Japan, but a group of small, high-income countries from northern Europe. It may also be noted that there is a group of (overwhelmingly Muslim) countries in Africa and Asia that score very low on ‘openness to people’, mainly because of widespread negative attitudes towards inclusion on equal terms of women, homosexuals and immigrants into society (Figure 1.6). Such
Figure 1.4 Openness to ideas (75 countries, 2002–04)

Source: Fagerberg and Srholec (2009).
Source: Fagerberg and Srholec (2009).

Figure 1.5 Openness to business (75 countries, 2002–04)
Source: Fagerberg and Srholec (2009).

Figure 1.6 Openness to people (75 countries, 2002–04)
observations beg further questioning about the role of deeper social and political factors in the long-run development of such countries.

CONCLUSIONS

The global division of labour is changing. China, India and a number of other countries from the developing world have increased their presence in the global economy during the last decade. Nevertheless, this is, as pointed out in the introduction to this chapter, far from a uniform tendency. Many, if not most, developing countries fail to mimic this performance, and global inequality, whether measured between countries or at the individual level, is on the rise. The pressing problem, from a policymaker’s point of view, is how to identify policies that can help change these trends.

For a long time, the standard developed-country advice (the so-called Washington Consensus) to policymakers in the developing world was to replicate the institutions and policies – particularly with respect to trade and foreign investments – already in place in the developed part of the world (for example, the United States). It is now clear, however, that this advice was based more on ideology and (widely shared) beliefs than on solid empirical evidence. In fact, the evidence presented in this chapter and in other recent research clearly shows that developing countries that adopt Western-type institutions and practise openness to international trade and FDIs do not perform better than those that do not. As pointed out by Ha-Joon Chang (2002), several countries that have succeeded in catching up have done exactly the opposite of what the Washington Consensus would suggest.

What can one learn from all this? To start, policy advice should not solely be based on ideological concerns: it should be evidence based. So what does the evidence tell us about the challenges facing developing countries today? The global knowledge economy presents developing countries with both opportunities and challenges: opportunities, because there is an enormous amount of knowledge out there to exploit, and challenges, because it is not at all easy to succeed in doing so. Successful exploitation of knowledge requires technological capabilities that cannot be taken for granted. Therefore, creation of such capabilities should be at the centre of attention of policymakers in the developing world. The evidence clearly suggests that countries that succeed in doing so are the ones that manage to escape the vicious circle of poverty, disease and social and political unrest that characterize many countries in the developing world today (Fagerberg and Srholec, 2010).
The changing global economic landscape

The emphasis placed here on technological capabilities should not be seen as suggesting that there is an easy ‘technological quick fix’ to the problem of underdevelopment. Firm-level technological capabilities do not develop in a vacuum. Such capabilities extend beyond the individual firm to the broader network of firms, organizations and institutions in which the firm is embedded. Moreover, there is a strong correlation and, arguably, interdependence between technological capabilities of firms and the character of the broader social, political and economic environment in which they operate, what Abramovitz had in mind with the notion of ‘social capabilities’ (Fagerberg and Srholec, 2010). The significance of this extends far beyond familiar topics such as the importance of education, infrastructure, access to finance, and the maintenance of law and order. It also has to do with the openness of society to new ventures and its ability to mobilize the talent of its own population to participate in such undertakings. As mentioned above, countries that fail to do so, because of, say, culturally inherited disrespect for certain parts of the population based on ethnicity, gender or religion, are likely to lag in the development process. Hence, successful development will require the advancement of both technological and social capabilities, and the latter may be as challenging as the former.

NOTES

1. This chapter draws on joint work with Martin Srholec, and I am grateful for his permission to use it here. The chapter has also benefited from comments and suggestions from the commentator and other participants of the Cournot Centre conference, ‘The New International Division of Labour’, held 12–13 November 2009. Remaining errors are my own.

2. Recent analyses by Branko Milanovic (2009) based on revised estimates of GDP deflators confirm the long-run trend towards divergence across countries, but also provide evidence of a possible trend break around the turn of the millennium. His analysis stops in 2006, however, and as he points out, it is too early to conclude definitively on the subject.

3. It might be argued that while possibly true for countries, this might not apply for individuals across the globe, since some of the countries whose income per capita has grown fast recently are in fact very populous. Nevertheless, income differences within large, fast growing countries, such as China, have also increased dramatically during the process, so the outcome for global inequality at the individual level is far from obvious. In fact, recent analyses (see Milanovic, 2009) indicate that the differences across individuals across the globe have increased over the last two decades.

4. Josef Schumpeter had already in The Theory of Economic Development (1934 [1911]) suggested that an economy with no innovation (given knowledge, behaviour, and so on) would be in a stationary state (constant productivity). He called this state ‘the circular flow’. This suggestion was met with strong criticism at the time. In 1956, however, Solow published a formal model that proved that this proposition would hold (in equilibrium).
5. The term ‘Washington Consensus’ was coined in 1989 by John Williamson to describe a set of policy prescriptions that he thought institutions such as the IMF, World Bank, and the US Treasury should promote in their relationships with developing countries. As Williamson has pointed out, however, the term subsequently came to be used as a synonym for ‘market fundamentalism’. For an overview see http://en.wikipedia.org/wiki/Washington_consensus.

6. It has been shown that the relationship between openness to trade (exports) and economic growth differs a lot across time. For long periods, the relationship has been found to be insignificant or even negative (Vamvakidis, 2002).

7. See, for example, Abramovitz (1986) and Cohen and Levinthal (1990).

8. For a good overview see Foray (2004).

9. Adelman and Morris saw economic development as contingent on broader social and political changes accompanying the transition from a traditional (rural) way of life, based on a high degree of self-sufficiency, to a modern industrialized society characterized by market relationships and new forms of institutions and governance.

10. Putnam defines ‘social capital’ as ‘features of social organization, such as trust, norms and networks, that can improve the efficiency of society by facilitating coordinated actions’ (Putnam, 1993, p. 167). In sociology, the term is often used as an attribute of individuals, not as a characteristic of communities, as in the tradition of Putnam. For an overview and discussion of different usages of the term, see Portes (1998).

11. Firms’ own judgements about their innovativeness (innovation counts) might be another possible source of information, but such data are only available for a limited number of countries and time spans. See Fagerberg et al. (2010) for more information on this data source.

12. The importance of education and skills is emphasized repeatedly in the economic literature. For an overview see Krueger and Lindahl (2001).

13. For details on these indicators/sources see Fagerberg and Srholec (2008, 2009).

14. To measure the latter (differences in political system) one could, for example, use variables reflecting the degree of democracy versus autocracy, the extent of checks and balances in the political system, the degree of competition for posts in the executive branch and legislature, and the extent of political rights and civil liberties. Since Western democracies will tend to have high values on most of these variables, a possible approach might be to measure in such a case the degree of ‘Westernization’ of a country’s institutions.

15. Fagerberg and Srholec’s study indicates that the most advanced innovation systems are to be found in smaller countries (in terms of population) such as Australia, Denmark and Norway. These three countries, it may be noted, are low by international standards on patents and R&D. Fagerberg and Srholec (2008) suggest that the explanation for this difference may be that these countries have well-developed capabilities for exploiting knowledge.

16. As noted, this is a factor that is deemed particularly important by followers of the ‘new growth theory’. The results reported by Fagerberg and Srholec (2008) indicate, however, that ‘openness’ to trade and FDI is uncorrelated with economic development. This holds irrespective of whether country size is controlled for or not.

17. The possibility that economic growth in some sense affects capability building (or some aspects of it) cannot be excluded a priori. Fagerberg and Srholec (2008) tested for the possibility of an endogeneity bias in the estimates, because of a possible feedback from economic growth on capability changes, using the Hausman (or Durbin–Wu–Hausman) procedure (for further details see Wooldridge, 2002, pp. 118–22). The test failed to detect evidence of endogeneity bias.

18. See the introduction to this chapter and the references therein.

19. The GDP per capita figures in Figures 1.4 to 1.6 are averages over the years 2000–04, measured in constant (2000) international USD, using purchasing power parity rates (PPP).

20. A common assumption in factor analysis is that for a factor to be retained, it should
The changing global economic landscape

explain at least as much of the total variance as an average indicator; that is, the factor should have ‘eigenvalue’ above one. In the estimates reported here, only one factor with an eigenvalue above one was identified (see Fagerberg and Srholec, 2009, for details).

REFERENCES


The changing global economic landscape