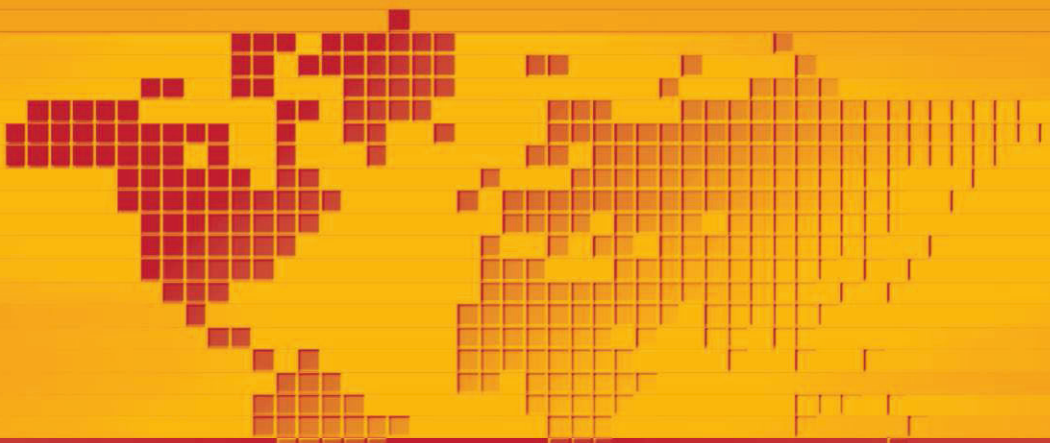


Axel Dreher
Noel Gaston
Pim Martens

Measuring Globalisation

Gauging its Consequences



 Springer

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For Nicole, Ifumi, Nic, Robin and Timo

FOREWORD

For a new book on globalisation, it may be common practice in this day and age to begin with an apology for adding to such an immense literature. A Google web search in October 2007 resulted in over 16 million references to “globalisation”, over 29 million for “globalization” and nearly 10 million for “mondialisation”. Not only would there be countless millions more references in languages other than English, American or French, but the numbers by the time this monograph reaches the bookstores is likely to be understated several-fold. The magnitude of the numbers is indicative of the widespread concern with everything and anything to do with globalisation. We suspect that globalisation leaves few people untouched and indifferent. A visible manifestation, of course, is the protesters – increasingly from all walks of life – at WTO, IMF and G-8 meetings. It is clear that what may have been early unquestioned enthusiasm has been supplanted by genuine concerns about further global integration.

As for an apology, we offer none. First, the sheer magnitude of the interest in globalisation reflects an interest in the effects that globalisation has on our daily lives. The Earth System may be the most complex entity that ever emerged in our universe and the contemporary process of “globalisation” may be the most intricate dynamic that will ever pervade that entity. Secondly, there is considerable confusion about what modern day globalisation really is. Globalisation is a polymorphic concept. When it comes to globalisation, each social commentator or academic researcher has something different in mind. It is hardly surprising that some researchers find that globalisation is a substantial boon for a nation’s citizens, while others paint an extremely gloomy picture. It is one purpose of this monograph to focus attention on what globalisation is. We argue that an agnostic approach to the issue involves the scientific construction of sufficiently broad and encompassing indices of globalisation.

In the following chapters, we define and then measure the forces of globalisation. Existing analyses of globalisation emphasise different factors as the key elements behind the contemporary impact of this phenomenon. Moreover, they each presuppose a different definition of globalisation. In our opinion, rather than attempting to define globalisation and determine its effects by emphasising particular aspects or factors, it would be far more useful to adopt a more multi-dimensional, pluralistic approach. This approach prevents an over-simplification of the complexities involved in understanding globalisation, while permitting a flexible definition of contemporary globalisation.

To illustrate, consider those regression-based studies that analyse the relationship between greater flows of international trade and labour market outcomes, e.g., earnings inequality. Two well-known problems with multiple regression analysis (the workhorse for social scientists) underscore the pitfalls of an overly narrow focus of analysis. First, there is the problem of omitting important variables. To avoid biased estimates of the impact of globalisation on inequality, all

relevant aspects of globalisation have to be included in a regression model. This list of omitted variables might not only include well-travelled economic variables, such as foreign direct investment, but also indicators of political engagement and social integration. Secondly, there is the ever pervasive issue of variable (mis-) measurement and interpretation. For example, economists tend to find the impact of trade liberalising agreements and greater international trade with less developed countries on the distribution of earnings to be quite small. However, it requires a substantial leap of faith to argue that globalisation has similarly small effects. It is hardly surprising that non-economists tend to view the sanguine pronouncements of economists about a more integrated world with a mix of disbelief and incredulity.

To be in a position to evaluate the consequences of globalisation in a rational and scientific manner, objective indicators are needed. To assess the extent to which any country is more (or less) globalised at any particular point in time requires much more than employing data on flows of trade, migration or foreign direct investment. Although largely neglected in the economics literature, both political integration and social integration are likely to be important for income inequality. For example, in the absence of restrictions on capital mobility, a country is more likely to competitively lower taxes or offer subsidies to attract investment, the closer is a potential host country's culture to that of a source country and the easier it is to exchange information. Lower taxes may also lower social standards and this is one channel through which the social dimension of globalisation may be important for income inequality. On the other hand, political integration may ameliorate a potential "race to the bottom", which may be induced by economic globalisation. Hence, while economic globalisation may increase inequality, political globalisation could actually serve to reduce it.

While discussing the recent attempts to measure globalisation, we focus most of our attention on the KOF Index of Globalisation, which has arguably become the most widely used measure of globalisation used by academic researchers and social scientists. We also illustrate the usefulness of the KOF Index for investigating some topical issues. Specifically, we investigate whether globalisation has affected government spending and taxation and if there has been a race-to-the-bottom in welfare state policies; whether globalisation has been good for economic growth; whether globalisation has contributed to declining union membership widely observed in many developed countries; whether globalisation damages the natural environment and, of course, whether globalisation has been responsible for the widespread increases in income and earnings inequality in the last two decades. To tantalise the reader, we simply note that while some of our results may be unsurprising, others shatter long-held beliefs and require a re-evaluation of the true effects of globalisation.

Finally, we would like to thank our colleagues at the International Centre for Integrated Assessment and Sustainable Development (ICIS), University of Maastricht, the Universities of Exeter, Mannheim and Konstanz, the KOF Swiss Economic Institute at ETH Zurich, the Globalisation and Development Centre (GDC) at Bond University, the Institute of Social Science at the University of Tokyo and particularly Christian Bjørnskov, Lotte van Boxem, Martin Gassebner, Ward Rennen,

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1 INTRODUCTION

During the last few decades, human dynamics, institutional change, political relations and the global environment have become successively more intertwined. While increased global economic integration, global forms of governance, globally inter-linked social and environmental developments are often referred to as globalisation, there is no unanimously-agreed upon definition of globalisation. It means different things to different people. Depending on the researcher or commentator, it can mean the growing integration of markets and nation-states and the spread of technological advancements (Friedman, 1999); receding geographical constraints on social and cultural arrangements (Waters, 1995); the increased dissemination of ideas and technologies (Albrow, 1996); the threat to national sovereignty by trans-national actors (Beck, 2000); or the transformation of the economic, political and cultural foundations of societies (Mittleman, 2000). Scholte (2002, p. 6) argues for the globalisation concept moving beyond being a buzzword for almost anything that is vaguely associated with it. Otherwise, discourse on globalisation runs the risk of being brushed aside as being "... 'globaloney', 'global babble' and 'glob-blah-blah'".

If things were not sufficiently confusing, there has also been a spawning of preferred terms and descriptors. Keohane and Nye (2000, p. 105) distinguish between globalisation and *globalism*, where the former term refers to the process by which globalism, i.e., "the networks of interdependence at multicontinental distances", is altered. The concept of internationalisation is also highly significant (see, e.g., Sassen, 1993; Chomsky, 1994; Held et al., 1999). It refers to the role of the nation-state, often in cooperation and interaction with other nation-states, in adapting to global challenges. In contrast, globalisation is often thought to be a direct threat to the existence of the nation-state itself. So, by and large, internationalisation is best thought of as the response to globalisation.

The world increasingly shares problems and challenges that are not confined within national boundaries. Multi-regional financial crises, world-wide pandemics and cross-border pollution are obvious examples. Such problems place the spotlight on the world's most prominent *supra*-national organisations – the United Nations (UN), the World Bank, the World Trade Organization (WTO) and the International Monetary Fund (IMF). Citizens' interests and welfare are increasingly being affected and, according to some, undermined by these bodies. If true, not only might such a development threaten representative democracy, but also it potentially abrogates the role of the nation-state itself.

It is also clear that globalisation is something more than a purely economic phenomenon manifesting itself on a global scale. Friedman (1999) associates modern-day globalisation with Americanisation (or more pointedly, U.S.-isation).¹ And, after all, shouldn't everyone just flow with the times and spell globalisation

¹ In the view of Ritzer (1993) an even better descriptor may be "*McDonaldization*".

with a “z”! Fiss and Hirsch (2005) analyse full-text datasets of newspaper articles and press releases related to globalisation and show that the globalisation discourse emerged as a response to greater U.S. involvement in the international economy. Between 1985 and 1998, the use of the term “globalisation” increased substantially. The authors argue that the term originates in the early 1970s, with little consensus of what it means or how it should be defined. Politically, socially and culturally, globalisation is thought to erode national cultures due to the pervasiveness of the global media and the information and communication technologies (ICT) revolution. The economic dimensions of globalisation have an impact. The flows of goods and services and factors of production – labour and capital – have both direct and indirect effects on the nation-state (Gaston and Nelson, 2004). With respect to the latter, national policies are affected – internationalisation, recall – and the economic, political and socio-cultural fabric of societies is fundamentally altered.

Among the more visible manifestations of globalisation are the greater international movement of goods and services, financial capital, information and people. In addition, there are technological developments, new and enhanced legal systems and institutions that facilitate these flows. On the cultural front, there are more international cultural exchanges, the spread of multi-culturalism and greater cultural diversity within many countries. Such developments are facilitated by the freer trade of more differentiated products as well as by tourism and immigration. Flows of immigration – both legal and illegal – also contribute to today’s melting pot societies.

For many commentators, particularly economists, there is little doubt that globalisation has produced significant gains at the global level (Bhagwati, 2004). Foreign trade in goods and services, capital, technology and labour all move more freely across borders. In addition to economic gains, there have been significant benefits in the areas of culture and governance (Falk, 2000). Public awareness of issues such as human rights, democracy and gender equality has increased significantly because of the greater access to newspapers, radio, television, telephones, computers and the internet. These developments have arguably led to improved allocative efficiency that, in turn, enhances growth and human development (UNDP, 1999).

At the same time, globalisation is also perceived as creating new threats: to individuals, societies and eco-systems. There are fears that it may exacerbate the gap between rich and poor – both within and across countries – creating new threats to human security in terms of financial volatility, political and cultural insecurity and environmental degradation. In other words, the beneficial, innovative and dynamic aspects of globalisation are being tempered, and according to some more than offset, by forces that create disruption and marginalisation, such as population growth and migration, the emergence of infectious diseases, widening disparities in development world-wide, climate change, an accelerating loss of bio-diversity and the scarcity and pollution of fresh-water resources.

The subject of fierce debate, protests and occasional violent confrontations, modern globalisation is a lightning rod for both its supporters and detractors. The

massive protests against globalisation were highly visible at the WTO summit in Seattle in December 1999. Seattle became a launch pad for further protests whenever the WTO, World Bank, the Group of Eight (G-8) or multinationals convened, e.g., at Quebec, Geneva, Göteborg and Genoa. Although the anti-globalisation activists were initially portrayed as a bunch of spoiled brats – donning New York Yankees baseball caps while chomping on Big Macs and quaffing Starbucks’ lattes – there has been a growing acceptance that the protest movement is heterogeneous. It consists of various groups of people that do not all share the same vision. Some oppose globalisation in its current form because it is seen as predominantly capitalist in nature. Others see it as a threat to national sovereignty. Other groups do not oppose capitalism per se, but criticise the inability to more equitably distribute the benefits of globalisation.

The delicate balance between the costs and benefits of greater global integration and reduced geographic isolation is illustrated by the temptation to closely associate contemporary globalisation with the growth of terrorism. Terrorist attacks more often take place in foreign countries that are geographically, culturally, socially and politically distinct from the terrorists’ own countries.² On the other hand, the least globalised countries seem to suffer the worst of the most significant terror attacks (Foreign Policy, 2005, p. 56). This is but one of many issues, which seem so closely linked with the process of globalisation.

But to answer questions about the overall impact of globalisation underscores the importance of measuring globalisation. Fiss and Hirsch (2005) cite a range of studies highlighting the negative and positive connotations often associated with globalisation. Ghemawat (2007) argues that globalisation is entirely overstated and that the World isn’t really flat after all.³ This highlights the fact that researchers and social commentators cannot even agree on the degree of globalisation. While some employ data on financial mobility to support their claim of the increasing importance of globalisation, others point to levels of trade comparable to the pre-World War I era. Still others point to decreasing migration as compared to earlier years. In this context, we argue that the complexity of the process of globalisation calls for a truly integrated but pluralistic approach that combines economic, socio-cultural and ecological dimensions (Rotmans and van Asselt, 1999).

To be in a position to evaluate the consequences of globalisation in a rational and scientific manner, objective indicators are needed. To assess the extent to which a nation-state is more (or less) globalised at any particular point requires much more than employing data on flows of trade, migration or foreign direct investment (FDI). Instead of choosing particular variables that best fit a particular author’s ideology, in our opinion, a measure of globalisation has to be developed independent of any specific research agenda. With this objective in mind, the

² According to Dreher and Gassebner (2008), political proximity to the United States – as measured by voting behaviour in the UN General Assembly – increases the frequency and severity of terrorist attacks.

³ Thomas Friedman’s 2005 best seller, *The World Is Flat*, argues that connectivity and globalisation have “flattened” the global competitive playing field.

development of a measure of globalisation is broken down into three separate tasks. First, globalisation needs to be defined as broadly as possible. Secondly, variables that best fit that definition have to be identified. And thirdly, a specific method to calculate the index has to be applied to these variables. Of course, there are many ways of describing the complexity of global dynamics including processes like globalisation, none of which is perfect. However, light can be shed on the increasing complexity of the global system by the process of measuring globalisation and by providing some examples that could enhance our insight into the functioning of it. Before proceeding to the technical measurement details, in the next Chapter we explain in greater depth the need for a pluralistic, multi-disciplinary conceptualisation of globalisation. In the fourth chapter, we reconsider the consequences of globalisation using the KOF Index of Globalisation. The final section concludes.

2 TOWARDS AN UNDERSTANDING OF THE CONCEPT OF GLOBALISATION

In any discussion about globalisation very few of the debate's participants deny the existence of the phenomenon. It is widely accepted that we all live in a globalising world. The debates and protests emphasise how important it is to measure globalisation. Without doing so, it is impossible to assess the severity or benefits of its effects and how it should be managed – if, in fact, it can even be managed. The winners and losers from structural changes that globalisation seems to accelerate are the prime political actors in the debates. As mentioned previously, globalisation became a prominent topic from the early 1980s. Until that time, the topic was irregularly discussed. While deindustrialisation in developed economies has long been a concern, it is moot as to why the most recent wave of globalisation has been such a hot issue.

According to Held et al. (1999), there are three dominant views on the historical analysis of globalisation: the sceptical view, the hyper-globalist view and the transformationalist thesis. The sceptics argue that internationalisation and global connections are by no means novel phenomena. By placing cultural, economic, political, social and technological developments on an evolutionary time-line, the sceptics argue that globalisation has existed for centuries and that the sum of recent developments only changes the scale and scope of globalisation and not the intrinsic characteristics of the phenomenon itself. The hyper-globalists, on the other hand, do not deny the importance of previous bouts of globalisation, but identify an historical juncture after which contemporary globalisation emerged. The previous eras are sometimes described as pre-globalisation or as periods of internationalisation. According to the hyper-globalists, contemporary globalisation is fundamentally associated with the erosion of the power and authority of the nation-state. The transformationalist thesis in some sense represents a compromise between the views of the previous two. The transformationalists argue that globalisation is the major force underlying the rapid, widespread social, political and economic changes that are currently reshaping and reconstituting modern societies and the world order. The nation-state still has an important, albeit transformed role.

Each perspective on globalisation emphasises different factors as the key elements behind the contemporary impact of this phenomenon. Moreover, they each presuppose a different definition of globalisation. In our opinion, rather than attempting to define globalisation and determine its effects by emphasising particular aspects or factors, it would be far more useful to adopt a more multi-dimensional, pluralistic approach. This will prevent an over-simplification of the complexities involved in understanding globalisation, while permitting a flexible definition of contemporary globalisation.

It is stating the obvious to declare that globalisation has not suddenly appeared out of the blue. An understanding of the type of factors and events that shaped globalisation will enable a better understanding of the overall context of

the contemporary discussions about it. In this chapter, globalisation is described and measured by identifying key economic, political, technological, socio-cultural and environmental landmarks that have accelerated the process of globalisation over a relatively short time span in several societal domains. To preview, different aspects that underlay globalisation are identified. These are: capitalism, technology, politics, the environment and social and cultural life. We restrict the number of key landmarks for the sake of clarity. This is not to say that other factors, events, processes and developments do not also influence globalisation or would not also serve as appropriate key landmarks. The selection of the key landmarks serves, however, to constitute a sufficiently multi-dimensional and pluralistic approach.

2.1 Capitalism as the incubator of contemporary globalisation

In current debates on globalisation, controversy rages about the historical dating of the phenomenon. Nobel laureate Amartya Sen (2002) argues that globalisation is *at least* a few thousand years old and that the West played a very minor role in its early phases. Sen rejects the commonly-made association of globalisation with *Westernisation*. At the other extreme, some scholars regard globalisation as being post-World War I. It is characterised by the unprecedented speed of change; in fact, change has been “turbo-charged” (Friedman, 1999). Other researchers are more wont to focus on events post-World War II. Economic globalisation in the post-World War II era has been spurred by the successive rounds of trade liberalisation under the auspices of the General Agreement on Tariffs and Trade (GATT), the forerunner to the WTO.

Freer trade of goods and services is promoted by the reduction or elimination of trade taxes or tariffs. Newly-negotiated free trade areas and customs unions, which lower average levels of trade protection, also promote greater trade. Taken in conjunction with the rapid declines in transportation costs, due in particular to the development of containerisation for ocean shipping, trade was able to recover after World War II.

Some globalisation sceptics argue that the Industrial Revolution was the breeding ground for globalisation, while others point to the period of European colonialism that dates from 1492 when Christopher Columbus discovered America. This latter period was also the era during which Vasco da Gama sailed around the Cape of Good Hope and the Spanish conquistadors conquered Latin America.

In contrast to the different views on the historical dating of globalisation, most historical and sceptical analyses of globalisation, as well as hyper-globalist and transformationalist descriptions, acknowledge that globalisation is largely driven by economic incentives. As Michael Hardt and Antonio Negri (2000) point out in their book *Empire*, modern globalisation can be distinguished from its earlier incarnations by its explicit foundation on capitalism rather than international trading.

Marxists argue that capitalism is driven by the accumulation of capital by means of a production system in which labour adds surplus value to the product. Only labour that adds a monetary value during the production process is considered productive. Other economic systems make no distinction between productive and non-productive labour. *“Only labour that generates material or non-material use value is produced according to the content”* (Dierckxsens, 2000). Since labour adds value to the capital employed, it is possible to accumulate capital by using productive labour. Modern wage labour, which receives a monetary reward instead of goods or services, was largely absent from earlier economic systems.

Another characteristic that distinguishes capitalism from other economic systems is the non-productive accumulation of reinvested capital (Giddens, 2000). Earlier economic systems were not characterised by capital investment and insurance on such a large scale. Rather than being reinvested, surplus money was saved or spent on consumption goods, prestigious buildings or works of art, such as churches, paintings and jewellery.

If one takes these differences between capitalism and earlier economic systems seriously, one implication is that the emergence of globalisation coincides with the emergence of capitalism. For example, the establishment and expansion of the first global trade networks of the Dutch and English colonial trading companies would not have been possible without a system of capital reinvestment, private ownership and commercial insurance. Two critical landmarks can therefore be identified in the predevelopment phase of globalisation. The first is the discovery of America, which symbolises the emergence of colonialism. The second landmark is the emergence of the first multinational, which can be identified as a symbol of the early establishment of capitalism as the world’s dominant economic system. This occurred in 1602 when the Dutch United East India Company (VOC) was founded. At its apogee, this trading organisation operated internationally, consisted of more than one hundred trading vessels and employed thousands of people working around the globe.

2.2 Technological innovation as the engine of globalisation

Technological innovations, particularly those in transport and communications technology, form a second primary foundation of globalisation. According to Langhorne (2001), globalisation originates in the second stage of the Industrial Revolution, with James Watt’s invention of the steam engine in 1765 being pivotal. Langhorne distinguishes three phases of technological innovation that marked the process of globalisation. The first phase is characterised by the application of the steam engine to land and sea transport and the invention of the electric telegraph. Steamboats and steam locomotives significantly reduced transportation time and increased transport volumes. The steamship was introduced in 1807, while the first successful test of the steam locomotive was not until 1825. The construction of railroads connected cities, regions, nations and continents to each

other, accelerating the pace of transportation. Moreover, this development increased the scope of industrial activities, thereby increasing the quantity of goods, the distances that goods could be shipped and people transported. It also made the distribution of information faster and less costly. The invention and improvement of the electric telegraph by Gauss, Weber and Morse between 1830 and 1850 separated the speed of communication from traditional forms of transportation for the first time. The latter represents an historical turning point in the development of globalisation, since distances in space and time decreased significantly. Nation-states were able to react and to learn more quickly from the events that occurred in their national territories, including those in remote colonies. When the first Trans-Atlantic telegraphic cable was laid in 1865, it also sped up international communication. The invention of the telephone and automobile further enabled the nation-state to increase control over its territories (Langhorne, 2001). The technological empowerment of the nation-state led to an homogenisation between different regions within the nation's territory. Examples of this are the introduction of standardised clock times and national newspapers. Although this phase had its most profound impact on the nation-state, it also made international trade and financial contracting easier. Because of the technological homogenisation processes, nation-states commenced trading with larger and disparate geographical regions. In addition, international standards, such as Greenwich Mean Time, were introduced which improved timetabling and communication for international activities (Mackenzie and Wajcman, 1999).

The second phase began during World War II when German engineers working on the V-2 project invented rocket propulsion. After the War, the intense technological competition between the Soviet Union and the United States accelerated the development of rocket and satellite technology. The technological ability to launch rockets into space made it possible to launch orbiting satellites into outer space. Thus, a truly global and reliable communication system was established for the first time in human history. Although international telephone communication was previously possible, the connections were usually of poor quality. The widespread use of the telephone was therefore in large part restricted within national boundaries. Hence, the introduction of satellite communication exists as a bellwether in the improvement of international communication (Langhorne, 2001).

The last phase is the invention of the computer. Although the invention of the computer dates from as early as 1942, the capacities of the first computer barely exceeded the capability of today's hand-held calculator. However, the invention of the microchip in 1971 by Intel increased the speed, processing volume and efficiency of computers. Similar to the introduction of the electric telegraph, the invention of the microchip can be considered a major turning point in the development of globalisation. The microchip forms the core of contemporary information and communication technologies. The development of ICT has led to a similar revolution, reducing distances in space and time, as the electric telegraph had done more than a century ago (Castells, 1997; Harvey, 1989). Further innovations and applications of the microchip have led to the emergence and widespread use of the internet and other computer communication systems. More importantly, the inven-

tion of computer technology and the microchip made it possible to construct global data networks that function as the hardware for the global financial capital market. According to Langhorne, the invention of the computer and its widespread applications characterise the current phase of globalisation.

Another important technological development has been the innovations in transport technology, such as container transport and passenger aircraft. Since the end of World War II, the international mobility of people and the international tradability of varieties and quantities of goods have increased dramatically. Although the rapid growth of international passenger flights and transport increased over a longer time span, a concentration of growth can be discerned in the 1970s.⁴

Overall, it needs to be noted that while Langhorne provides a convincing analysis of the role of technology in the process of globalisation, his argument is technologically deterministic. By stressing the role of technology, Langhorne obscures the other factors and domains that also play a key role in the process.

2.3 Political dimensions of globalisation

Although the interaction between the emergence of capitalism and technological innovation arguably formed the foundation for globalisation, political dimensions cannot be ignored. Globalisation is integrally a political process, since governments may shape or severely limit possibilities for private entrepreneurship. This *internationalisation* is distinct from the “exogenous” process of globalisation. By the mid-nineteenth century Great Britain was the main political and economic power that adhered to *laissez-faire* and free trade politics. This political direction fostered the expansion of international economic activities. As a result, other countries, such as the Netherlands, also shifted towards free trade politics. This led to an increase in national income, Gross Domestic Product (GDP), as well as World GDP. In addition, international production chains and networks expanded, leading to the emergence of a world economy (Bergesen, 1980).

After World War I, most national economies directed their attention to rebuilding their economies. Many governments focussed on establishing strong national economies and decreasing economic dependency. Mines, railways and power stations were nationalised, tariff barriers were raised to protect the national economy, various restrictions were placed on financial transactions and speculation was proscribed. The 1944 Bretton Woods Conference resulted in the Bretton Woods Agreement, which established the international Bretton Woods system and foreshadowed the establishment of the World Bank, the IMF and the international gold standard.

During the interregnum between the World Wars, many governments realised that international co-operation was essential to minimise the possibility of another War. Although international organisations were not a new phenomenon (e.g., the International Telecommunication Union, 1865; the International Telegraph Union

⁴ Recall that this period is when the microchip was introduced.

and Universal Postal Union, 1874), many influential international and supra-national organisations were founded shortly after both World Wars. The League of Nations was founded after the Paris Peace Conference of 1919. Among the League's explicit objectives was dispute resolution between countries through negotiation, diplomacy and the improvement of global welfare. The League became the very first global "government of governments". In the 1920s, the League ultimately proved incapable of preventing aggression by the Axis Powers in the 1930s. The onset of World War II made it clear that the League had failed in its primary mission – to avoid future world wars. The UN replaced it after World War II and inherited a number of agencies and organisations founded by the League.

Just before the establishment of the UN, most industrialised countries had signed the Bretton Woods Agreement. This agreement led to the emergence of an international monetary political system. In 1944, the IMF was founded, followed shortly thereafter by the establishment of the World Bank in 1945 and the GATT in 1947. In addition, the establishment of the European Economic Community (EEC) in 1957, the Organisation of Petroleum Exporting Countries (OPEC) in 1960 and the Organisation of Economic Co-operation and Development (OECD) in 1961 also increased and intensified international and supra-national political and economic co-operation.

It was not only economic and political power-related issues that shaped the process of global politics. The foundation of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1945, the United Nations International Children's Emergency Fund (UNICEF) in 1946 (permanent status in 1952), as well as the emergence of various international non-governmental organisations (NGOs), such as Amnesty International in 1961 and Greenpeace in 1970, drew international attention to social, cultural and environmental issues, such as human rights and global climate change. The establishment of these global organisations was an important factor underlying the emergence of global social, cultural and environmental politics, such as the Rio Conference on Global Environmental Change in 1992.

The political dimensions of globalisation are clearly important. The extent to which some national governments may feel pressured to adapt their economic policies to the neo-liberal ideologies that interact with the dynamics of global capitalism is an obvious manifestation. Paradoxically, at an individual level, some commentators have argued that nation-states have come to have considerably less influence on globalisation than other factors. As with the economic dimensions, researchers have to be circumspect about laying over-arching emphasis on the political dimensions of globalisation.

2.4 The Global Village and the social and cultural aspects of globalisation

So far we have mainly discussed economic, political and technological factors as the driving forces of globalisation. However, the late 1960s also witnessed remarkable socio-cultural changes. The rise of the flower power generation, anti-Vietnam pro-

tests, the sexual revolution and movements for the emancipation of women, non-whites, homosexuals and other “minorities” represent only the tip of the iceberg. For example, the emergence of pop art also marked the change to a post-modern culture (Harvey, 1989). Moreover, the publication of Marshall McLuhan’s *The Medium is the Massage* in 1967, in which the world is described as becoming a “global village”, is one of the first socio-cultural landmarks that points at the existence of globalisation. Considering these circumstances, it is impossible to regard globalisation as purely an economic, political or technological phenomenon.

The increased influence of the media on our daily lives has not only changed our way of perceiving the world and our consumption patterns, it has also affected local cultures. In the view of the cultural pessimists, the United States (particularly Hollywood) has established a global culture, arguably at the cost of traditional and local ones (Bourdieu, 1998). Youth the world over have especially embraced this culture, emphasising the freedom of choice that this global culture often advocates.

The introduction of the television in the 1950s, for example, has had a profound impact on people’s daily lives. Moreover the invention of information and communication technologies has also influenced a lot of people’s lives with its introduction of e-mail, chat rooms and blogging. As long as the technological facilities are available, personal communication between individuals is possible, regardless of the distance separating them.⁵ However, the world has not only become practicably smaller – new spaces, such as the internet, have simultaneously shaped a new dimension in our lives. Castells (1997) refers to the present era as the information age. The emergence of the information super-highway and international and global media networks such as BBC-World, CNN or Al-Jazeera, as well as national and local media connected to global media networks, provide us daily with news from all over the globe (Kellner, 1995). The world is increasingly becoming a global village because people’s lives – irrespective of their specific location – are connected with other parts of the world through the media. The news of oppressed Afghan women in burkas does not leave us unaffected. Less than sixty years ago the average citizen may barely have known that Afghanistan existed.

At the local level, globalisation has not led just to what some commentators argue to be an “Americanisation” of traditional cultures. It has also increased interpersonal international cultural exchanges via migration, tourism and exchange studentships. Many homogeneous societies have been transformed into multicultural communities in which people from different cultural backgrounds and ethnicities live together.

The development of multicultural societies has certainly not been without its problems, or its detractors. The unsettling re-emergence of extremist political parties, the segregation of cultures and even ethnic riots, illustrate the problematic side of socio-cultural integration at the local level. In a world in which financial capital and many goods can be moved freely from one country to another, the tightening of immigration laws seems to be “deglobalising”. Socio-cultural factors

⁵ For example, this monograph has been written by three authors living continents apart.

therefore not only change as a result of globalisation, they can be causes, as well as challenges to the process of globalisation itself.

2.5 Globalisation and the environment

Globalisation need not necessarily have a deleterious effect on the environment. However, some of the manifestations of globalisation, such as the expansion and intensification of air traffic, car, truck and sea transport, waste and increased consumption of water and fossil energy have profound impacts on the natural environment. These processes affect the environment on various scales, ranging from the local to the global. For instance, the demand for hardwood and wood-chips in developed countries, such as Japan and the Netherlands, accelerates deforestation, soil impoverishment and a loss of local biodiversity in less-developed parts of the world, such as Brazil and Indonesia. The effect of local deforestation does not always remain local, but can also have regional and even global effects (e.g., global climate change). Although global disasters are yet to be fully realised, major changes in the natural environment, caused by the polluting side effects of consumerism, for example, are affecting our world. At local levels this is becoming increasingly apparent through soil impoverishment, desertification and water and air pollution. The UN High Commissioner for Refugees has highlighted the plight of refugees who fled their homes due to environmental disasters (UNHCR, 1997).

Since the publication of Meadows' *The Limits to Growth* for the Club of Rome in 1972, there has been a growing awareness of the exhaustion of the natural environment through human activities on local, regional and global levels. In addition, from the late 1970s, global warming has become an environmental problem of global political and scientific concern (Martens and Rotmans, 1999). As historical landmarks, the publication of *The Limits to Growth*, the first World Climate Conference organised by the World Meteorological Organisation (WMO) and the UN Conference on Environment and Development in Rio de Janeiro in 1992 symbolise the growing concern about the devastation of the global environment driven by the processes of globalisation described in the previous sections. Some examples of changes in the global environment closely linked with globalisation are climate change, ozone depletion and a loss of biodiversity.

Global climate change: The majority view of climate scientists is that the continued accumulation of heat trapping greenhouse gasses in the troposphere will induce changes in global patterns of temperature, precipitation and climatic variability over the coming decades. A rise of one to three degrees Celsius over the coming half-century, greater at high than at low latitudes, would be a faster rate of increase than any encountered by human-kind since the inception of agriculture around ten thousand years ago. The UN's Intergovernmental Panel on Climate Change and various other national scientific panels have assessed the potential consequences of this scenario of climate change for health, agriculture, water, ecosystems and the economy, for example.

Stratospheric ozone depletion: Higher in the atmosphere, depletion of stratospheric ozone is already occurring by human-made gasses such as chlorofluorocarbons (CFCs). Ambient ground-level levels of ultraviolet irradiation are estimated to have consequently increased by up to ten per cent at mid-to-high latitudes over the past two decades, with consequences for human health (e.g., skin cancer) and biodiversity. By virtue of the Montreal Protocol of 1987, updated in the 1990s, the release of many of these gasses has been curtailed. However, a problem remains with black-market sales and with the escalating production of halons by China and other low-income countries temporarily exempted from the production ban.

Biodiversity loss and invasive species: As human demand for space, materials and food increases, populations and species of plants and animals are increasingly exhausted. An important consequence for humans is the disruption of ecosystems such that “natural goods and services” decline (Martens et al., 2003). Biodiversity loss also means that we are losing, prior to their discovery, many of nature's chemicals and genes – of the kind that could potentially confer enormous medical and health improvement benefits. In the meantime, “invasive” species are spreading around the world into new non-natural environments via intensified human food production, commerce and mobility.

Although environmental factors should not be ignored when analysing globalisation, they differ from the other dimensions of globalisation. In contrast, environmental factors usually appear as the consequence of globalisation, rather than as a separate driving force. However, many environmental factors, such as global climate change, may become driving forces in the future. Consider, for example, an increase in the numbers of ecological refugees. The rising sea levels due to global warming are predicted to engulf and submerge many South Pacific islands and communities. The eventual necessity to relocate Pacific Islanders may require international intervention, as presently unaffected countries set other priorities.

2.6 Framing globalisation by its timeline

Figure 2.1 shows a parsimonious representation of various historical landmarks of globalisation, many of which were discussed before. Various developments are “clustered” in time. These clusters may indicate processes in which various factors reinforce each other and consequently push the process of globalisation further. Thus, identifying clusters can help to identify different phases of the globalisation process. This is not to say that globalisation is an evolutionary process, which evolves according to a deterministic pattern. However, taking the extensiveness, intensity, velocity and the impact of contemporary globalisation into account, it is legitimate to assume that the processes underlying it have the potential to change over time, in a possibly nonlinear way, characterised by periods of progress, stabilisation and temporary decline.

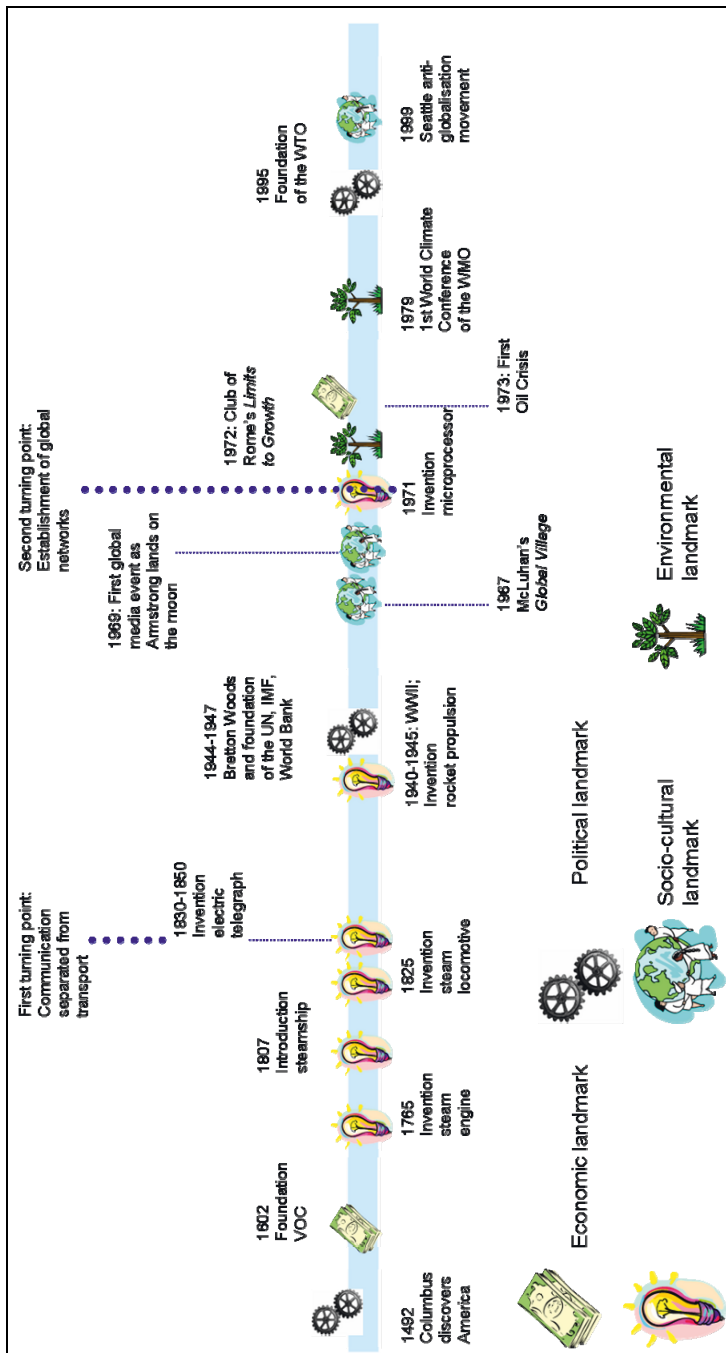


Figure 2.1 The Globalisation Timeline

The thick dotted lines in Figure 2.1 illustrate new phases, or major turning points in the globalisation process. Note that the time span between historical landmarks is relatively short in the late 1960s and early 1970s. The second turning point designates the change towards contemporary globalisation because this period was also characterised by a high concentration of social, cultural and environmental developments that also became important factors that together shaped globalisation. Taking this into account, two definitions of globalisation seem self-evident. If globalisation is conceptualised by reconstructing and identifying historical landmarks before the second turning point, observe that the landmarks are predominantly economic, political or technological in character. Hence, from an historical point of view, globalisation is intrinsically an economic, political and technological process. However, this definition refers to the emergence of globalisation and not to its current state.

From the 1960s, socio-cultural developments have become increasingly key factors in the process and nature of globalisation. Therefore, the historical definition of globalisation would be incomplete in contemporary contexts. Consequently, we propose a contemporary definition of globalisation that more accurately describes its current state. The difference between the historical process of globalisation and its current state is too complex to be reduced to a single definition. The use of an historical and contemporary definition thus prevents a simplification of the complexities involved in approaching globalisation. Above all, the historical development of globalisation is not the same as the actual phenomenon in its present form, e.g., the introduction of the steam engine is distinct from the introduction of the steam locomotive.

The second definition of globalisation thus refers to this process in its current incarnation, including social, cultural and environmental factors. Hence, contemporary globalisation is defined as the intensification of cross-national interactions that promote the establishment of trans-national structures and the global integration of cultural, economic, environmental, political, technological and social processes on global, supra-national, national, regional and local levels.

2.7 Digression: The challenge of sustainable development in a globalising world

Sustainable development is a complex concept. There are scores of different definitions, but consider one of the more frequently applied and better-known ones: *“Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs”* Brundtland Committee (1987).

The lowest common denominator of the different definitions and interpretations of sustainable development share four common characteristics (Grosskurth and Rotmans, 2005). The first is that sustainable development is an inter-generational

phenomenon, and therefore, any meaningful analysis of sustainable development must span at least two generations, i.e., about 25–50 years.

The second common characteristic is the *level of scale*. Sustainable development is a process played out on several levels, i.e., global, national, regional and local. For instance, what may be considered sustainable at a national level is not necessarily sustainable at an international level. Cross-border pollution is an obvious example.

The third common characteristic is that of *multiple domains*. Sustainable development consists of at least three: the economic, the ecological and the socio-cultural domains. Although sustainable development can be defined in terms of each of these domains alone, the significance of the sustainability concept lies precisely in the inter-connections between them.

Note that the three different aspects of sustainable development need not in theory conflict, but in practice, they often do. The underlying principles are also essentially different. For sustainable economic development, economic and allocational efficiency are primary; for sustainable social development, justice and equity are central, and with sustainable ecological development, the concepts of resilience or capacity for recovery are fundamental.

The fourth common characteristic concerns the *multiple interpretations* of sustainable development. Each definition demands a projection of current and future social needs and how these can be provided for. Of course, estimation may be objective and, somewhat inevitably, inherently uncertain.

Sustainable development therefore involves reconciling the potential conflict between economic growth and the environment, in addition to the other issues more traditionally associated with economic development. According to the 2005 World Summit Outcome Document, sustainable development refers to economic development, social development and environmental protection. Accordingly, it is fundamentally affected by globalisation and bears directly on internationalisation.

The socio-cultural, economic and ecological interactions are depicted in Figure 2.2, using the framework of multiple capital models (e.g., Munasinghe, 1993; Spangenberg and Bonniot, 1998). Social aspects are related to the behaviour of the various actors (i.e., the individuals, institutions or communities). These are all closely-linked to the stocks of human capital (i.e., both the health and acquired skills of individuals) and social capital (i.e., institutions, cultural cohesion and collective knowledge). Economic aspects relate to the production and consumption of the energy, agriculture, industry and services sectors. Ecological aspects relate to the nature of the ecosystem, viz., the physical, chemical and biological processes, climate change and biodiversity.

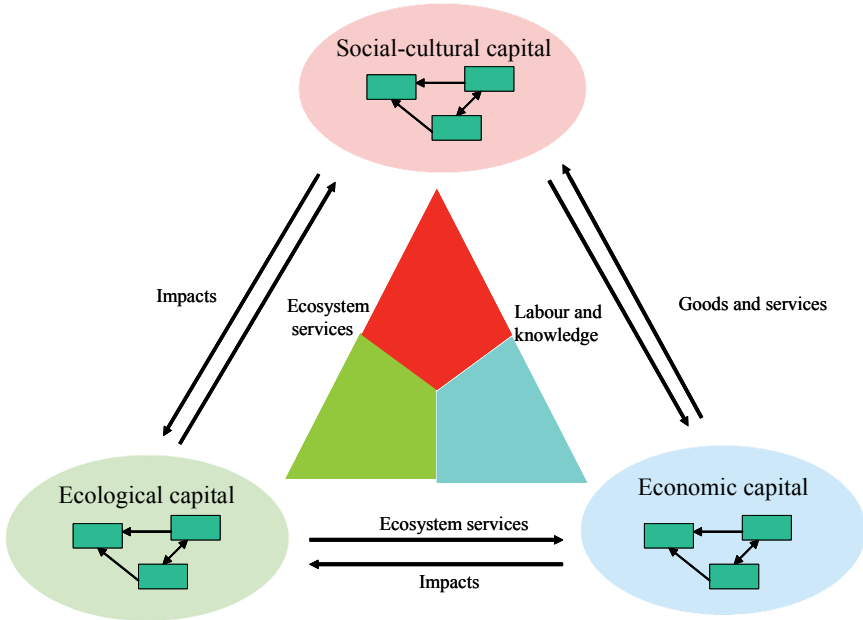


Figure 2.2 The Triangular Model (source: Martens and Rotmans, 2005)

A global assessment is provided by the four scenarios developed by the Intergovernmental Panel on Climate Change (IPCC, 2000) to estimate the emissions of greenhouse gasses over the next century (see Box A). These scenarios focus on changes in economic, technological and demographic trends and energy use as major drivers for global climate change. Specifically, they explore the global and regional dynamics that may result from changes at a political, economic, demographic, technological and social level. The different scenarios vary along two dimensions. The first relates to the extent of regional economic convergence and socio-cultural interactions. The second has to do with the balance between economic objectives and environmental and equity objectives. There are four scenario *families*, each of which contains a number of specific scenarios.

Box A The IPCC Special Report on Emission Scenarios (SRES)

The **A1** scenario is characterised by rapid economic growth, low population growth and the rapid introduction of cleaner and more efficient technologies. Social concerns and the quality of the environment are subsidiary to the primary objective of achieving economic prosperity. Underlying themes combine economic and cultural convergence and the development of economic capacity with a reduction in the gap between rich and poor. Regional differences in per capita income decrease in relative terms.

A2 also envisages a future in which economic prosperity is the main goal, but prosperity is now expressed in more heterogeneous terms. Underlying themes include the reinforcement of regional identity with an emphasis on family values and local traditions. Technological changes occur more slowly and in a more fragmented way compared to the other scenarios. This is a world in which there is greater diversity and regional differences.

In **B1**, economic prosperity is subordinate to the search for solutions to environmental, social and equity problems. While the pursuit of global solutions results in increased globalisation and fast-changing economic structures, this is accompanied by the rapid introduction of cleaner technologies and a shift away from material values. There is a transformation towards a more service and information-based economy.

B2 describes a world that advances local and regional solutions to social, economic and ecological problems. This is an heterogeneous world in which technological development is more moderate and where considerable emphasis is placed on initiatives and innovation from local communities.

The A1 and B1 families emphasise successful economic convergence and social and cultural interaction; while A2 and B2 focus on diverse regional developments. Finally, while A1 and A2 stress economic development and leave only a subsidiary role for environmental and social concerns, B1 and B2 reverse those priorities.

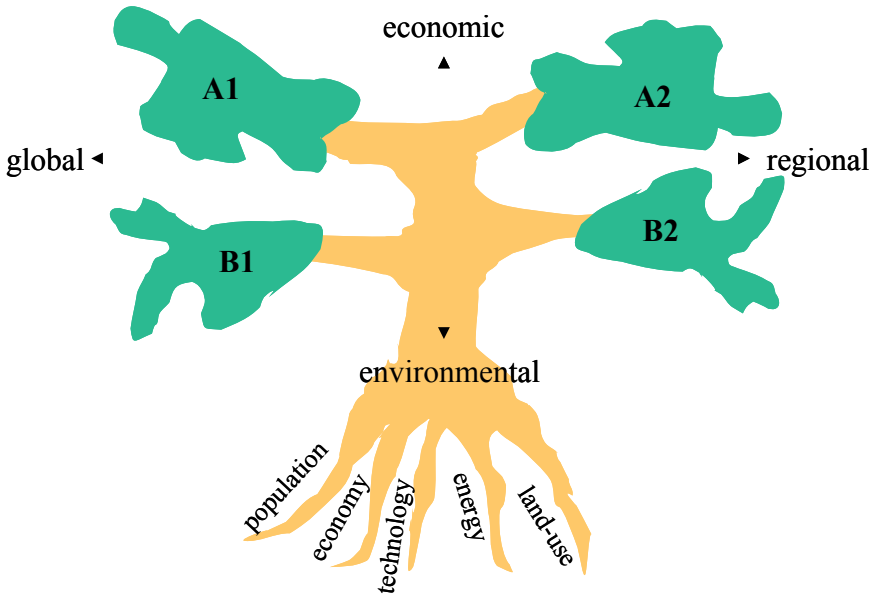


Figure 2.3 The IPCC SRES scenarios as branches of a two-dimensional tree

Note: The dimensions indicate the relative orientation of the different scenarios in relation to economic or environmental concerns as well as global and regional development patterns (IPCC, 2000).

While the IPCC scenarios (see Figure 2.3) unquestionably influence many of today's policy-makers, they have obvious drawbacks. They narrowly focus on population growth, technological and economic development as the main drivers of global change. More significantly, the scenarios are essentially static and thus need to be more responsive to global dynamics (see Table 2.1 and Figure 2.4).

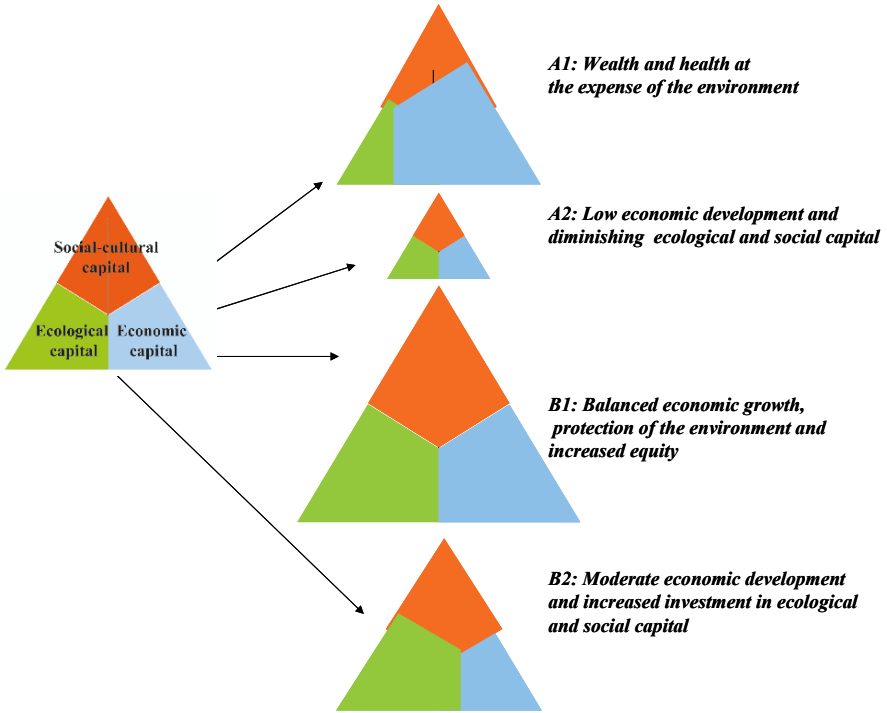


Figure 2.4 Future developments and the dynamics of capital stocks

Table 2.1 Issues linked with the IPCC-SRES scenarios

SRES scenario	Water	Biodiversity	Health	Tourism*
A1	⊖	↘	↗	⊖
A2	↘	↘	↘	↘
B1	↗	↗	→	↗
B2	→	→	↗	↗

Legend: ↗ favourable development; ↘ unfavourable development; → moderate or no change, ⊖ mixed.

* considering a wide variety of impacts (see Martens and Rotmans, 2002, for additional details).

In the world depicted by the A1 scenario, globalisation develops rapidly. Economic growth is pursued at the expense of the environment. Economic growth and rapid technological progress lead to better living standards. Tourism grows quickly. Developing regions are integrated into the global economy, allowing technologies to diffuse rapidly. However, economic growth leads to increasing demand for water and many developing regions experience water shortages. Carbon dioxide emissions increase significantly and the tourism sector becomes prominent. Significant reductions in biodiversity continue. Overall human health and social conditions improve and GDP per capita rises. Yet short term gains in economic growth, health and wealth are offset in the longer term by severe reductions in the quality of natural resources.

In an A2 world, the prospects are bleaker. There is greater self-reliance in terms of resources and less emphasis placed on interactions between regions. Economic growth is skewed and the gap between rich and poor fails to narrow. Pressures on key natural resources such as biodiversity and water are exacerbated. These scenarios describe a rapidly globalising world without global governance, with falling world prosperity and with environmental degradation. The downward spiral of poor economic growth and environmental degradation – combined with the diminution of social capital – leads to worsening health and well-being.

In a B1 world there is rapid change and convergence. Economic development is balanced, an effective welfare system prevents social exclusion and the protection of the global environment becomes a priority. Tourism develops at a moderate rate, but without significant pressure on the environment. In contrast to the A1 scenario, more effort is made to tackle global environmental issues such as loss of biodiversity and water scarcity. The transition to lower fertility and mortality levels is enhanced due to increased investments in social and ecological capital. Here, economic developments are consistent with ecological and social objectives. In B2, education and welfare programmes reduce mortality rates in several regions. There is a favourable climate for community initiative and social innovation. There is genuine concern for the environment. Due to the high education levels and the enhanced organisation within communities, the pressure on water and biodiversity is significantly reduced, although the regional differences remain. The development of tourism is slow but well-planned.

Drawing conclusions from the IPCC's global assessment is bound to be a subjective exercise. Despite record rates of global economic growth, disparities in wealth between the developed countries and the developing world remain. Focusing attention to the developing world reveals even greater disparities between more successful countries and those that remain the least developed. Many in the latter group seem progressively less able to participate in the current global economic system.

With hindsight, global development has had its successes as well as failures. Many problems identified in earlier "doom scenarios" remain, but have certainly not destroyed the planet. Threats such as global cooling, fossil fuel and mineral exhaustion have receded, while others have proved susceptible to effective policy intervention, such as population pressure and industrial pollution. On the other

hand, new and unexpected threats have emerged, such as the proliferation of nuclear weapons, global terrorism, global climate change and the global threat of infectious diseases. Overall, it is clear that the overly gloomy and overly rosy predictions regarding the earth's future are unreliable, ill founded and misleading as well as being politically counter-productive.

The increasing complexity of global society means that sustainable development cannot be addressed from a single perspective, country or scientific discipline. Planning for sustainable development is an extremely complex task. Sustainable development requires innovative methods that balance the short term and long term, the objective and value-laden, the quantitative and qualitative, the certain and uncertain. Part of this necessitates measuring the impact that global developments have.

It is the interactive co-evolution of multitudinous technological, cultural, economic, political, social and environmental trends on all conceivable spatio-temporal scales. Despite controversies about the historical evolution and the nature of globalisation, the major forces at stake are primarily economic, political and technological. This does not imply that social, cultural and environmental factors are not also important, but these latter forces are not always clearly distinguishable.

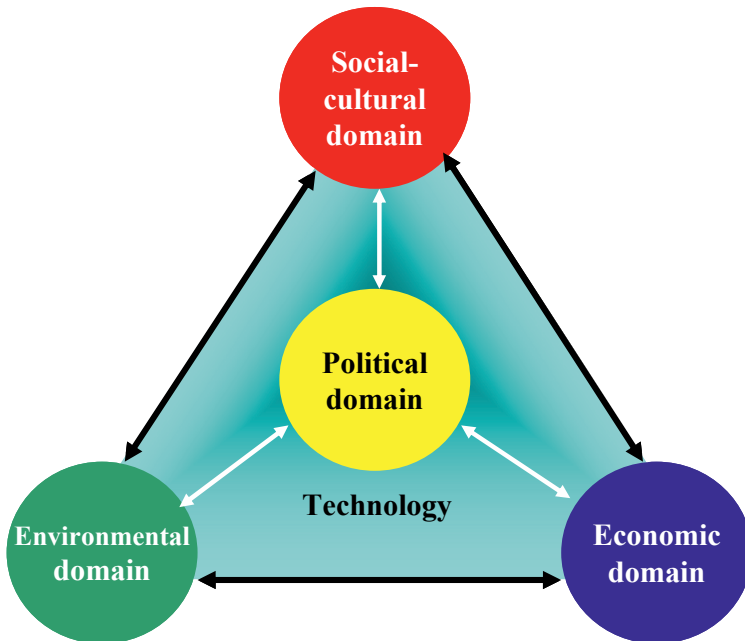


Figure 2.5 A pluralistic approach to globalisation

In addition, the boundaries between the various dimensions – better referred to as domains – are not fixed. Rather, they are inter-connected and affect each other in various ways. Figure 2.5 presents a multi-domain model, which shows the interaction between the various domains and dimensions of globalisation. In this model, technology occupies a mediating role since the application, functioning and innovative impulses of technological developments are always an integral part of economic, environmental, political and socio-cultural practices. The widespread application of the internet is a good example of this. While the internet has its origins in the U.S. military-industrial complex, it became commercially attractive and transformed into a mass medium.

This multi-domain, pluralistic approach enables us to perceive globalisation as a phenomenon, or an over-arching process in which many different processes simultaneously take place in many domains. Consequently, the term globalisation is a collective label and not one giant process in itself (Martens and Rotmans, 2002). After all, not all factors that underlie or shape globalisation, or all the consequences of this process have yet been identified. Acknowledging the pluralistic character of the forces that drive globalisation and its consequences are an essential step in describing the phenomenon.

To summarise, it seems sensible to adopt a pluralistic approach, analysing past and current processes taking place in multiple domains. Using the globalisation timeline and the multi-domain model prevents a simplification of the complexities involved in approaching globalisation, while permitting a flexible definition of contemporary globalisation.

3 THE MEASUREMENT OF GLOBALISATION

3.1 The use of indicators to measure globalisation

Globalisation has become to be far more than a social commentator's buzzword in contemporary times. Consequently, the measurement of globalisation is now of central concern, whether for academe, business, the mass and specialised media or policy circles. In business, globalisation measures or indices can be employed for gaining insight into the investment climate, the current developments of growth and for an understanding of the international business environment. For the media, an index can be the subject of a short news item or a feature article. It can also serve as an illustration for news coverage on related topics, such as technological developments. For policy-makers, globalisation measures provide a world perspective within which policy initiatives will be operational.

Globalisation sceptics expect the costs associated with globalisation to exceed the benefits. There are fears of eroding social and environmental standards, high poverty rates in less developed countries and more frequent financial crises. Many, and in all likelihood most, economists strongly believe that the net effects of globalisation are positive. The optimistic support stems from positive economic theory and the apparent support by a number of empirical studies. To measure globalisation, most of these studies use proxies such as international trade and capital flows.⁶

Unfortunately, proxies of globalisation can only give partial answers. They are likely to be tangential to the issue of sustainable development, for instance. More comprehensive measures of globalisation have to be used in order to analyse the consequences of globalisation. The indices presented below not only provide an informative ranking of how globalised a country is relative to others, but the indices themselves can also be employed to empirically analyse the consequences of globalisation and to more accurately inform debate.

When a phenomenon like globalisation encompasses several aspects that taken together may have an effect greater than the sum of their constituent parts, it appears logical to assess these effects together. Composite indices provide an excellent way to accomplish this since they provide a single statistic on which comparisons can be based, without the confounding effects of variation at lower levels of aggregation.

If globalisation indices are to be informative they ought to bridge some existing gaps. As an example, if culture is so important to globalisation how can it be measured? Also, the interpretation of an index needs to provide a significant contribution to the debate.

⁶ Using openness proxies, Beer and Boswell (2001) and Mah (2002) examine the consequences of globalisation on inequality and Li and Reuveny (2003) analyse their effects on democracy. Heinemann (2000) finds that more globalised countries have lower increases in government outlays and taxes. Vaubel (2000) finds them to have lower government consumption.

If the primary objective is to derive a comprehensive measure of globalisation, then there are several conditions that a composite index of globalisation needs to fulfil. In particular, it has to be relevant, robust, transparent and it needs to add value (i.e., to not be redundant). Indices used in previous research have been criticised for their lack of theoretical foundation and relevance and their lack of robustness (Scholte, 2002; Lockwood, 2004). The differentiation of a measure of globalisation from the concepts identified by Scholte (2002) as dead-ends in the globalisation debate – namely internationalisation, liberalisation, universalisation and Westernisation – is especially challenging in this context. Further, many potential measures of globalisation are likely to be correlated with economic development. Therefore, a comprehensive globalisation measure must not simply be a more complicated measure of economic development.

Robustness is concerned with the reliability of measurement under all circumstances. First, the choice of indicators and weights will inevitably be subjective. Therefore, results must not be overly dependent on such choices. Secondly, low quality (i.e., low reliability and poor comparability) of the underlying data is a serious issue in any such undertaking. Even so, the index should not be too sensitive to omitted or extreme values in the data and should perform well over the whole range of countries and all of the dimensions it covers.

To add value, the index should provide a better understanding of globalisation than can be obtained by simply looking at its component parts. This means that a good composite index should (i) be constructed of components that are not highly correlated with each other and (ii) that “*the index itself should not be highly correlated with any of its individual components*” (Noorbakhsh, 1998a, p. 602). Otherwise, complexity would be needlessly added, making the results harder to interpret and analyse, thus raising the possibility of errors occurring in the process.

Finally, transparency helps others judge how valuable the index is for their own use. This is a requirement for not only the methodology employed but also the quality of data sources, methods of data collection and so on. Most of the data available today were not collected with a “global” concept in mind but rather with a view to the nation-state as the relevant territorial unit. Assumptions made when using these data and their limitations therefore need to be clearly stated.

3.2 The literature to date

Somewhat surprisingly, the measurement of globalisation using indices is a relatively recent development. Starting with the indices introduced by the World Markets Research Centre (WMRC, 2001) and a collaborative effort between the A. T. Kearney Consulting Group and Foreign Policy Magazine – A.T. Kearney/Foreign Policy Globalisation Index (abbreviated here as “ATK/FP”) – a new stream of research was established to try to quantify globalisation.⁷ In this research, globalisa-

⁷ See *Foreign Policy* (2001, 2004 and 2005).

tion is essentially “reverse-engineered” by breaking it down into parts to simplify the task of finding globalisation’s quantifiable aspects. On a country-by-country basis, data on the different dimensions of globalisation are combined into an index.

Due to their influence on subsequent research, the ATK/FP and the WMRC indices are reviewed first, followed by a short description of other recent attempts to measure globalisation. The Maastricht Globalisation Index (MGI)⁸ and the index produced by the KOF Swiss Economic Institute are then presented.

The World Market Research Centre G-Index: The G-Index, published by the WMRC, is a primarily economic-based index (90 per cent of the weight). The remaining ten per cent is devoted to technology (specifically, telephone traffic and the number of internet hosts each account for five per cent). While acknowledging that globalisation has profound political implications, the WMRC define globalisation as “*the ever closer knitting together of a one-world economy*”. In an attempt to measure the “*depth, breadth and richness of the broadest range of economic links binding an economy to the rest of the world*”, the world economy is categorised into “old economy” and “new economy” (see Randolph, 2001).

The a priori weights of the index lean heavily towards trade and exports, with “international trade” and “service exports” making up 70 per cent of the overall index weight. This raises the scores of small trading nations that have large (transit) trade volumes with respect to their internal economy (e.g., Singapore). Accordingly, 11 out of the top 12 countries according to the G-Index are small trading nations or offshore financial centres. Since the authors only use economic data, they are able to include nearly all countries – a total of 185. For some countries, there is an analysis of the evolution of the scores over a 30-year period.

The A.T. Kearney/Foreign Policy Magazine Globalisation Index: The ATK/FP is a broader index and probably the most widely-known measure of globalisation.⁹ In addition, many alternative globalisation indices use the ATK/FP index as their benchmark. The ATK/FP was first published in 2001 and covers 62 countries using 14 indicators. This relatively small number of countries account for 96 per cent of the world’s GDP and 84 per cent of the world’s population. It divides the measurement of globalisation into the economy, the political system, migration and tourism.

It covers political engagement, technology, personal contact and economic integration on a global scale. The authors use the magazine’s yearly rankings of countries to paint a picture of developments during the most recent calendar year, explaining why countries rose or fell in the overall ranking or on domain-specific sub-indices. By comparing their index to several measures of well-being and economic development, they also try to assess the effects of globalisation on the so-called “race-to-the-bottom”, at least as it relates to social and environmental standards.

Political factors are assigned half the weight of foreign direct investment, with the entire economic portion of the index having six times the weight of the political

⁸ Originally published as the Modified Globalisation Index (Martens and Zywiets, 2006).

⁹ The report titled *Measuring Globalisation* is published annually in *Foreign Policy* magazine.

portion. Similar disparities exist between the indicators in the sections on technology and personal contact. These latter domains are each comprised of several component indicators. For example, internet users, internet hosts and secure servers are included in the technology domain. Membership in international organisations, participation in U.N. Security Council peace-keeping missions and in-country embassies appear in the category of political engagement. Travel and tourism, international telephone traffic and cross-border transfers are in the personal contact category and, most importantly, international trade, foreign direct investment, portfolio investment and income payments and receipts are in the economic category.

Alternative recent attempts to quantify globalisation include Salomon and Sokolowski's (2004) *Global Civil Society Index*. This index is intended to measure citizens' political participation, prevalence of civil society groups and tolerance towards immigrants, among other factors. Their method of constructing the index is similar to that of the *Human Development Index*, i.e., the individual variables are included in the overall index additively.

Al-Rodhan, Stoudmann and Herd (2006) propose a globalisation matrix to analyse the impact of certain topical issues on the state, religion and the international system.¹⁰ The authors employ political, economic, societal, military and environmental variables. Kluver and Fu (2004) focus on cultural globalisation. While they discuss a number of obvious symbols of globalisation, such as Starbucks, their index only includes the volume of traded books and newspapers scaled by population. Miles and Posner (2007) suggest the number of bilateral and multilateral treaties as a measure of political integration. According to their data, states entered more than 40,000 bilateral and more than 600 multilateral treaties since World War II, with an increasing rate of treaty-making since then, at least among the most active states. Another interesting measure of political integration is introduced in Nitsch (2005). He compiles data on travel activities of the heads of state of France, Germany and the United States between 1948 and 2003, comprising 1513 official travels. Bamrud (2005) quantifies globalisation in Latin America, based on trade, FDI, tourism, remittances and internet penetration. Andersen and Herbertsson (2005) provide what is essentially a replication of the actual economic flows sub-index provided by KOF (see below), but for a smaller number of years and countries. Heshmati (2006) provides another replication of earlier work, but includes tests for stability and discussion. Another globalisation index mainly following the approach of ATK/FP has been developed by the Centre for the Study of Globalisation and Regionalisation (CSGR, 2006) at the University of Warwick. The CSGR index covers 119 countries and includes the number of books, films and newspapers as indicators of globalisation. Li, Pang and Ng (2007) provide a similar analysis for 62 countries over the period 1998–2002. More specifically, they complement the variables used in ATK/FP by incorporating two variables describing an economy's pattern of external trade.

¹⁰ See Kale (2004) who discusses the link between, religion, spirituality and globalisation.

O'Neill et al. (2005) calculate a Growth Environment Score for a cross section of 170 countries in order to capture the principal factors contributing to economic growth. They include 13 variables that have been shown to robustly influence economic growth in the economics literature. The individual data are converted to indices on a 0–10 scale and the overall index is derived as a simple average of the individual indices.

Riezman, Whalley and Zhang (2005) construct measures of globalisation by comparing actual data to data generated by a counterfactual full integration equilibrium. While offering some information about the relative ranking of countries, they fail to obtain robust and reliable ordinal measures of globalisation. An additional problem of their approach is their reliance on simple general equilibrium models that are based on the assumption of perfect competition (de Lombaerde and Iapadre, 2007). Gersbach (2002) focusses on the micro level and measures globalisation by the intensity of contacts and foreign direct investment at the industry level in Germany, Japan and the United States. Arribas, Pérez and Tortosa-Ausina (2006) employ network analysis techniques and focus on trade flows for 59 countries over the period 1967–2004. Basically, the authors define a country as fully globalised when the sum of its exports equals its GDP and its exports to all other countries are proportional to the size of the recipient economy (i.e., the export to GDP ratio for each country should be the same). More recently the OECD (2005a, 2005b) is also involved in work on economic globalisation indicators, but as yet does not construct a composite index of globalisation.

3.3 The MGI and KOF globalisation indices

In what follows, we present two indices of globalisation developed by two of the authors of this monograph. The Maastricht Globalisation Index or the “MGI” developed by Martens and Zywiets (2006) refers to a cross-section of 117 countries, while the 2002 KOF Index of Globalisation constructed in Dreher (2006a) covers 122 countries for the period 1970–2002. We also present a new index that is based on the 2002 KOF Index of Globalisation. Decisions have been made concerning which of the variables should focus on the extensity, intensity, velocity or impact of the measured aspect as well as whether to adjust the variables for the geographical characteristics of a country, among others (Held et al., 1999). While the MGI and KOF indices are very similar in many respects, there are notable methodological differences. For example, the MGI explicitly includes an environmental dimension. The latter is outcome-based and therefore excluded from the KOF Index. These differences partly reflect disagreements about the relative merit of various methodological options. Partly these differences have arisen due to the simultaneous and independent development of the indices. As will be shown below, however, the resulting rankings do not crucially depend on the specific methodological choices made.

Another major difference is the choice of whether or not to adjust variables included in the indices for countries’ geographic characteristics. Controlling for

these factors might improve the understanding of the other, more subtle determinants of globalisation (e.g., past and present policy choices) that might ultimately be more interesting. Given the geographical characteristics of a country, these policy choices also affect economic development (e.g., GDP per capita). “*Stripping out the effects of economic development from the various measures of globalisation would in fact be removing valuable information from these measures*” (Lockwood, 2004) which is why they should be included. Lockwood (2004) found that the ranking of countries in the original ATK/FP index “*critically [depends] on their geographical characteristics, as much as on their policy stance*”. Pritchett (1996) argues that when comparing countries’ trade intensity account needs to be taken of obvious structural features of the economy, such as size and differences in transportation costs. Intuitively, these factors will also affect the other measures of globalisation. For example, the trade intensity of Panama of 201.6 per cent in 1998 was more than eight times higher than the 24.4 per cent of the United States according to ATK/FP (2002). Arguably, whether Panama is eight times more economically open than the United States is debatable. The geographical location of Panama at one of the major crossroads of international trade, its size and its history are likely to be primary factors in its openness. However, one could equally well argue that the reasons for a country’s openness should not matter for its globalisation score. Put differently, the fact that Panama is more open than the United States because it is at one of the major crossroads of international trade does not change the fact that it is indeed more open and – by definition – more globalised. Whether correcting for such exogenous factors is a priori desirable is an open question. Correcting some variables included in globalisation indices while not correcting others makes indices hard to interpret. The preferable option might be to control for these factors statistically when analysing the causes and consequences of globalisation rather than correcting the index a priori. While the MGI opts to correct for such exogenous factors, the KOF Index does not.

The construction of an index requires that the measures be normalised. If this were not done, the relatively small variations in one component or its distribution might completely swamp relatively larger variations in others. However, different methods for normalising the data have significantly different impacts on the outcome, which is why the choice is important. On the one hand, when normalising data from several years at the same time, termed *panel normalisation*, the results are well-behaved in terms of sensitivity to extreme values. On the other hand, changes in one year could affect the ranking of countries in another year – a decidedly undesirable property. For this reason Lockwood (2004) proposes what he terms *annual normalisation*, i.e., the data are normalised for each year. Normalisation with different parameters (mean, variance, extreme values) for each year can have the effect of “*moving the goal posts*”; in effect letting a country slip in the rankings despite absolute gains in integration. However, Noorbakhsh (1998b, p. 522) argues that “*in an international context the goal posts are in fact moving*”. If the extant rest of the world is becoming more globalised, a country whose integra-

tion is less than the rest of the world is being left behind. Different scales, means and distributions will alter any weights that are assigned to the different index components and therefore change the relative composition of the index. As described in more detail below, the KOF Index uses panel normalisation. The MGI refers to a cross-section of countries, so panel normalisation is not an issue here. Both indices normalise the original variables before including them in the respective indices.

Another issue refers to how the variables included in the index should be weighted. There are several options for assigning these weights, all with their advantages in certain situations. For human development, for example, there might be subjective reasons for assigning a priori weights (e.g., the belief that education is equally important as life expectancy). For globalisation, however, the case is less clear-cut. Since there is no universal agreement on what globalisation is, and even less agreement on the relative importance of its components, some authors have advocated the use of statistical methods to derive weights for the index components (e.g., Noorbakhsh, 1998a; Lockwood, 2004; Dreher, 2006a). They evaluate the impact of using statistically optimal weights instead of a priori weights as significant but small in absolute terms. The modification adds considerable complexity to the index, however. In fact, the cost in terms of complexity may fall well short of the benefit. While the MGI simply adds the individual dimensions, the KOF Index uses statistical analysis to derive these weights.

The MGI: The Maastricht Globalisation Index or the “MGI” was developed by Martens and Zywiets (2006) to improve upon the ATK/FP and WMRC indices. Some of the previous indices have an arguably neo-liberal focus on the economic dimensions of globalisation. This may stem from the definition of globalisation used. As argued earlier, the definition of globalisation should refer to the process in its current state, including social, cultural and environmental factors. Hence, contemporary globalisation is defined as the intensification of cross-national interactions that promote the establishment of trans-national structures and the global integration of cultural, economic, environmental, political, technological and social processes on global, supra-national, national, regional and local levels (Rennen and Martens, 2003).

One objective of the MGI is to extend existing analyses of globalisation by including coverage of sustainable development. It covers 117 countries and modifies the ATK/FP on a range of points: the processing of data, the choice of variables, the weights of variables and the interpretation of the outcome. In addition, the MGI introduces two new variables to the composite index: the environment and trade-in-arms.

The MGI is constructed in a four-stage process.¹¹ The first stage is conceptual and choices are made about which variables are most relevant and should be included in the index (see Table 3.1). This decision is primarily subjective, but in practical terms, constrained by data availability.

¹¹ See also UNDP (2002) and Zywiets (2003).

Table 3.1 Maastricht Globalisation Index (MGI) variables

Category	Variable name	Variable definition	Source
Global politics	Embassies	Number of in-country embassies and high commissions in (2000)	Europe World Yearbook www.europaworld.com
	Organisations	Number of memberships in international organisations (2000)	CIA World Fact Book www.cia.gov
Organised violence	Military	Trade in conventional arms as a share of military spending (1997–99)	Stockholm International Peace Research Institute www.sipri.org
Global trade	Trade	Imports + exports of goods and services as a share of GDP (1999)	World Bank (2002)
Global finance	FDI	Gross foreign direct investment as a share of GDP (1997–99)	World Bank (2002)
	Capital	Gross private capital flows as a share of GDP (1997–99)	World Bank (2002)
People on the move	Migrants	Foreign-born residents as a share of population (2000)	www.unpopulations.org
	Tourism	International arrivals + departures per 100 inhabitants (1998)	World Culture Reports www.unesco.org
Technology	Phone	Incoming + outgoing international telephone traffic in minutes per capita (1999)	International Telecommunication Union www.itu.int
	Internet	Internet users as a share of population (1999)	International Telecommunication Union www.itu.int
Environment	Eco	Ecological deficit in global hectares (1999)	Living Planet Reports www.panda.org

In the second stage, suitable quantitative measures are identified for these variables. In the third stage, the quantitative measures selected in stage two are distributed with different means and different variances. Nearly all the indicators are distributed exponentially. (In fact, exponential growth is found in many natural and social phenomena.) Two of the indicators are presented in Figure 3.1.

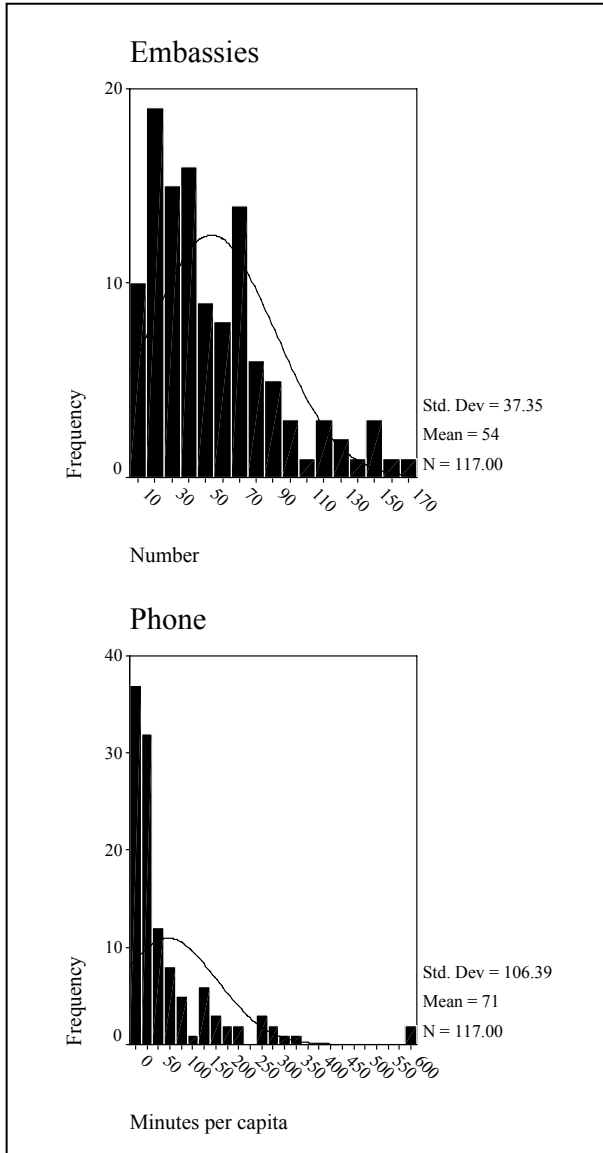


Figure 3.1 MGI raw data frequency distributions (1999 data)

Taking the natural logarithm of the variables removes most of the effect of the different distributions from the data, because it transforms the exponential growth curve into a linear relationship. It is then easier to compare and adjust the data further. See Figure 3.2.

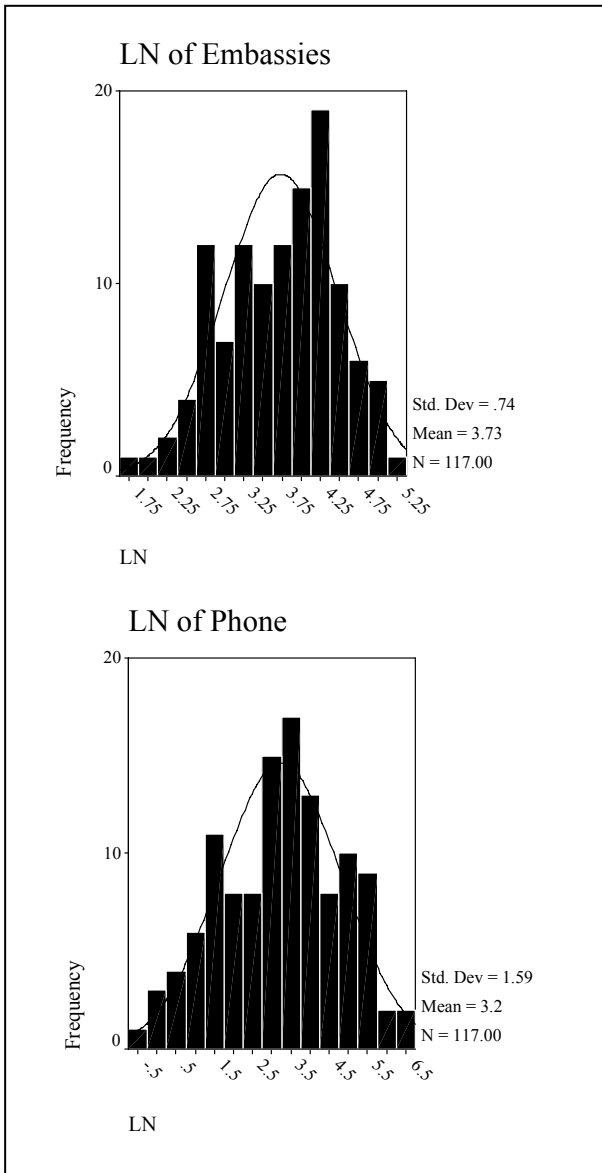


Figure 3.2 MGI transformed data frequency distributions (1999 data)

The effects of geographical factors are removed by regressing all of the indicators on the factors proposed by Lockwood (2004), the natural logarithm of population and a land-locked indicator (i.e., measuring whether or not a country has a coastline). The *Tropics* indicator that Lockwood proposes is not included, as its theoretical basis is unconvincing, while his area variable (the natural logarithm of surface area) was insignificant for all but two indicators. However, the natural logarithm of population and the land-locked dummy are significant at the five per cent level for all but three of the indicators and generally have the expected signs. See Table 3.2.

Table 3.2 Geographical adjustment: regression results for all indicators (1999 data)

	Log of Population	Significance Population	Land-locked Dummy	Significance Land-locked	R ²	p-value*
Log of Embassies	0.328 (0.034)	0.000	-0.490 (0.120)	0.000	0.547	0.000
Log of Organisations	0.069 (0.013)	0.000	-0.128 (0.046)	0.006	0.291	0.000
Log of Military	0.138 (0.189)	0.466	-1.697 (0.657)	0.011	0.072	0.015
Log of Trade	-0.178 (0.028)	0.000	-0.022 (0.098)	0.824	0.268	0.000
Log of FDI	-0.159 (0.092)	0.086	-0.281 (0.320)	0.381	0.027	0.207
Log of Capital	-0.146 (0.058)	0.013	-0.358 (0.202)	0.080	0.063	0.024
Log of Internet	-0.115 (0.142)	0.422	-0.109 (0.496)	0.031	0.041	0.093
Log of Tourism	-0.458 (0.115)	0.000	-0.524 (0.400)	0.192	0.123	0.001
Log of Migrants	-0.343 (0.101)	0.001	-0.280 (0.352)	0.428	0.092	0.004
Log of Phone	-0.392 (0.101)	0.000	-0.978 (0.353)	0.007	0.138	0.000
Eco	0.560 (0.252)	0.028	0.539 (0.877)	0.540	0.042	0.088
Mean		0.092		0.227	0.155	0.039

* F-statistic for model, standard deviation given in parentheses, the constant term is not reported.

In the last and final stage, a weighted sum of the measures is calculated to produce the final score, which is then used to rank and compare countries. The “most globalised” country has the highest score. The component scores are simply added, i.e., all indicators receive the same weight.

Components of the MGI: Reflecting the need for a balance between broad coverage, data availability and quality motivated the following choice of indicators, with data for 117 countries.¹²

Global Politics: First among the indicators of political integration are the diplomatic relations that constitute an historical basis for communication between countries. It seems logical that the more important are the links to the outside world, then the more diplomatic links countries will establish to stay informed, protect their interests and facilitate communication. Since no aggregated statistics on diplomatic relations are available at a global level, the number of in-country embassies and high commissions listed in the Europe World Yearbook are used. The data are available for nearly all countries world-wide, but are corrected for country size, since very small countries often cannot afford the expense of maintaining multiple embassies and often accredit one representative for several countries. Membership in international organisations is a similar measure of the extensity of the international relations and involvement of a country. Moreover, since such memberships do not necessarily entail the need to maintain expensive representations abroad, this measure is less dependent on the size of the country.

Organised Violence: This military indicator measures the involvement of a country’s military-industrial complex with the rest of the world. While data quality is low, they nevertheless offer an insight into weapons proliferation, international military aid and the reasons and results of international peace-keeping operations. As this dimension has not previously appeared in other globalisation indices, no comparison is possible with those indices. Of the quantitative military indicators proposed by Held et al. (1999), trade in conventional arms, compiled by the Stockholm International Peace Research Institute (SIPRI), is the only variable available for a reasonable number of countries. To make the data internationally comparable, a country’s trade in conventional arms is correlated to its military expenditure. Since a large share of the trade is in “big-ticket” items and programmes that are approved and recorded in one year may actually take several years to deliver and service, a moving three-year average is used. The period is arbitrary but offers a reasonable compromise between data availability and the need to smooth the data for infrequent, large purchases.

Global Trade: Like other globalisation indices, trade intensity is included as a measure of the intensity of economic globalisation. Trade intensity is the sum of a country’s exports and imports of goods and services as a share of GDP. The data in this domain have been documented thoroughly over an extended period, in many cases extending back to the nineteenth century. Trade in services has brought new challenges to the statistical process, as it is far easier to value goods

¹² See Table 3.1 for data sources.

physically crossing border checkpoints than, e.g., data processing or telecommunications, or even outsourced management consultancy services. Nonetheless the data are widely available and generally reliable.

Global Finance: FDI, representing financial enmeshment, is the primary indicator. Gross FDI, used here, is the sum of the absolute values of inflows and outflows of FDI recorded in the balance of payments financial accounts. It includes equity capital, reinvestment of earnings, as well as other long-term and short-term capital. This indicator differs from the standard measure of FDI, which captures only inward investment. For the measurement of globalisation, however, the direction of the flow is less important than the volume. FDI is the long-term involvement of a foreign firm in a country and has cascading effects throughout an entire economy. It exposes local companies to foreign technical innovations, management styles, techniques as well as increased direct competition. Because of these long-term effects and the high volatility of the flows in the face of changing economic conditions, the trailing three-year average instead of the single-year figures is used.

The second measure of financial interdependence used is gross private capital flows (as a percentage of GDP). This is the sum of the absolute values of direct, portfolio and other investment inflows and outflows recorded in the balance of payments financial accounts, excluding changes in the assets and liabilities of monetary authorities and the government. It measures the wider involvement of international capital in an economy and complements the FDI figures. Once again, the trailing three-year average is employed.

People on the Move: This measure encapsulates migration and the international linkages that come with the movement of populations between different countries. Newly-arrived immigrants often maintain close connections to their home countries based on family ties and cultural similarities, often sending money home to their relatives and economic dependents. While a detailed analysis of migrant stocks and flows, specified by type and reason of migration would certainly be instructive, again only limited data are available on a global scale. As immigration and naturalisation policies vary widely internationally and illegal immigration is widespread, the stock of migrants (the share of foreign-born residents of a given country) have to suffice as a measure of the intensity of this increasingly controversial dimension of globalisation.¹³

Tourism brings people in contact with each other. It changes attitudes and promotes understanding between cultures that would otherwise have little contact. As a major economic activity, it can bring prosperity to regions with no other resources than the natural beauty of the surroundings or the cultural value of historic sites. Tourism has grown steadily in the last century, the major impetus being cheaper air travel. It represents an important part of globalisation and is therefore included in the index. The World Tourism Organisation, the source of the data, provides the sum of international inbound and outbound tourists, i.e., the number

¹³ The data are for 2000 and available at: <http://www.un.org/popin> (accessed October 15, 2006).

of visitors who travel to a country other than their usual residence for a period not exceeding twelve months and whose main purpose in visiting is not employment related.

Technology: Although strongly related to GDP (with a Pearson correlation coefficient of 0.88), the share of a country's population that uses the internet still adds detail to the picture of the intensity of the technological aspect of globalisation. Whether informing the international community about human rights abuses in reclusive countries or giving farmers access to commodity prices on the world's exchanges, as a global medium that transmits information cheaply over large distances it is an important factor.¹⁴

The second component, international telephone traffic (again measuring intensity), can be used with fewer reservations, as the technology is older and therefore more widespread and less dependent on a country's income. International telephone traffic is defined as the sum of incoming and outgoing phone calls for a country, measured in minutes per capita (the original data are from the International Telecommunication Union, but are available from various published sources).

The Environment: Overlooked by existing indices are environmental indicators, i.e., measures of the intensity of globalisation in the ecological domain. Held et al. (1999, pp. 376–8) investigate global environmental degradation and the corresponding political and societal responses. These responses, however, are very difficult to track on a country-by-country basis. A more promising approach is to measure international linkages in terms of trade of goods that have a strong environmental impact, if not a high monetary one. Trade in software, for example will generally have a far smaller impact on the environment than trade in tropical hardwoods, hazardous waste or water-intensive agricultural products.

Ecological footprint data offer a summary for many of these components since production and trade of these kinds of goods are summarised in a single measure. An ecological deficit (a footprint greater than the bio-capacity) indicates that a country must either "import space" from somewhere (or stop "exporting" it) or face rapid ecological degradation. Similarly, an ecological surplus offers opportunities to "export space" by trade in space-intensive goods and services. The World Wide Fund for Nature's (WWF) Living Planet Reports provide ecological footprint and bio-capacity data in several categories (cropland, grazing land, forest, fishing grounds, energy lands and built-up land) and aggregate them into a single index, the ecological deficit (Loh, 2000, 2002). While a country with no ecological deficit or surplus could be either completely autarchic or a major trader, by definition there is less dependence on outside linkages. A high ranking according to this indicator therefore denotes more involvement with the outside world and, accordingly, a more globalised country along this dimension. The MGI is presented in Table 3.3.

¹⁴ The original source for the data is the International Telecommunication Union and is available from the World Bank (2002).

Table 3.3 The Maastricht Globalisation Index (MGI)

	MGI Rank	Embassies	Organisations	Military	Trade	FDI	Capital	Internet	Tourism	Migrants	Phone	Eco
Switzerland	1	3	3	9	50	9	2	1	2	7	1	18
Austria	2	1	1	14	33	63	11	2	1	22	2	25
Belgium	3	2	9	74	3	13	5	23	13	26	10	2
Netherlands	4	14	10	40	10	6	4	16	9	21	8	4
United Kingdom	5	9	12	70	57	3	3	13	7	19	5	9
Sweden	6	7	5	50	43	7	6	5	14	24	11	74
Czech Republic	7	4	19	21	9	20	14	15	5	58	14	19
Germany	8	15	7	82	40	28	9	14	6	13	7	22
Hungary	9	5	13	13	17	32	21	17	3	51	17	38
Ireland	10	30	17	87	8	8	1	20	15	37	6	64
France	11	8	2	59	67	22	23	25	4	12	9	27
Canada	12	10	8	83	21	17	39	3	10	9	4	113
Kuwait	13	6	34	26	73	78	29	36	24	2	32	1
Denmark	14	11	6	58	78	29	58	12	22	47	15	5
Finland	15	26	4	16	86	10	12	9	32	69	26	53
United States	16	31	22	79	105	31	38	6	11	1	3	12
Norway	17	18	11	48	79	37	33	4	19	42	19	13
Spain	18	25	20	60	60	26	13	29	8	43	16	17
Portugal	19	17	16	99	61	4	8	27	17	66	24	7
Italy	20	16	14	84	69	95	18	18	12	40	13	24
Slovak Republic	21	38	26	6	13	65	15	8	48	92	22	35
Malaysia	22	62	64	18	1	64	60	22	34	28	29	80
Israel	23	12	112	31	54	80	63	21	36	4	18	3
Estonia	24	84	95	33	15	30	25	24	20	18	44	20
Korea, Rep.	25	41	69	46	22	61	28	11	43	68	39	23
Greece	26	22	18	27	97	104	71	30	18	41	21	8
Poland	27	56	23	93	53	43	68	32	16	27	35	28
Russia	28	28	52	56	14	76	53	61	39	11	43	98
Kazakhstan	29	32	97	7	32	18	36	60	89	8	45	73
Jordan	30	19	30	25	27	74	109	51	65	5	46	21
Saudi Arabia	31	23	80	35	47	87	59	71	45	3	33	10
Australia	32	24	27	63	99	62	57	7	30	6	25	114
Bulgaria	33	21	40	20	26	46	66	46	21	85	59	43
Trinidad & Tobago	34	58	41	10	70	16	70	34	69	75	37	6
Moldova	35	101	89	36	20	54	10	58	25	23	42	47
New Zealand	36	49	21	15	92	19	32	19	38	16	12	116
Croatia	37	54	94	89	44	49	55	37	26	32	20	30

Table 3.3 (continued)

	MGI Rank	Embassies	Organisations	Military	Trade	FDI	Capital	Internet	Tourism	Migrants	Phone	Eco
Belarus	38	51	110	4	11	94	106	59	31	15	31	54
Chile	39	36	35	55	84	11	16	35	55	87	47	94
Ukraine	40	76	104	41	7	91	56	73	33	10	52	31
South Africa	41	27	66	91	76	68	24	33	47	45	53	37
Jamaica	42	68	51	1	55	52	69	54	50	109	30	14
Panama	43	42	57	65	85	15	7	62	70	70	62	79
Mexico	44	74	53	61	24	59	78	49	23	86	23	71
Latvia	45	63	107	69	51	40	35	38	54	17	60	69
Japan	46	40	48	86	113	101	26	10	28	59	34	11
Macedonia	47	57	77	2	58	96	67	39	72	84	27	16
Thailand	48	82	76	32	5	35	40	47	49	88	78	84
Turkey	49	59	38	34	62	106	73	43	44	49	40	65
Romania	50	39	43	62	59	57	77	42	42	96	51	42
Slovenia	51	70	75	68	41	100	90	26	41	79	36	15
Venezuela, RB	52	43	29	81	104	39	46	50	76	38	68	95
Armenia	53	93	68	88	83	25	30	53	68	56	38	49
Argentina	54	50	15	78	116	34	49	57	40	36	48	108
Costa Rica	55	48	63	94	42	70	84	41	58	39	54	52
Lithuania	56	94	111	47	52	45	54	48	46	33	73	44
Botswana	57	61	37	8	103	92	88	56	29	65	41	99
Tunisia	58	29	31	52	39	86	91	82	37	102	63	40
Uruguay	59	33	25	45	112	109	89	28	27	71	55	62
Dom. Republic	60	88	100	11	74	51	87	75	53	78	28	34
Philippines	61	91	96	80	4	75	44	52	73	101	67	72
Namibia	62	34	72	64	46	85	76	86	63	48	65	104
Egypt	63	20	24	23	93	93	75	76	74	97	75	67
Azerbaijan	64	87	82	113	64	1	19	85	62	67	64	48
Lesotho	65	114	56	102	28	2	22	99	35	115	50	46
Mauritius	66	105	36	57	29	108	82	40	59	107	66	26
Sri Lanka	67	96	73	54	37	89	85	80	52	63	83	56
Senegal	68	44	28	92	68	71	97	81	95	62	86	61
Indonesia	69	100	88	38	19	41	43	67	71	95	92	102
Ecuador	70	67	65	49	71	60	61	66	86	91	76	88
Kyrgyzstan	71	111	44	109	34	36	47	70	92	20	77	59
Bolivia	72	37	33	110	106	12	34	45	66	89	57	112
Nicaragua	73	53	79	108	16	21	27	78	77	100	82	87
Syria	74	47	98	97	63	103	45	98	78	34	80	39

Table 3.3 (continued)

	MGI Rank	Embassies	Organisations	Military	Trade	FDI	Capital	Internet	Tourism	Migrants	Phone	Eco
Angola	75	64	113	37	2	5	20	108	104	104	102	110
Colombia	76	83	45	71	98	44	64	55	83	98	56	100
Paraguay	77	46	49	106	91	69	79	65	51	52	58	107
China	78	99	115	77	23	14	31	64	82	114	70	101
Brazil	79	73	62	85	111	33	48	44	67	90	69	111
Georgia	80	107	114	19	75	50	99	79	60	57	81	51
Guatemala	81	77	70	98	100	23	42	69	81	103	72	55
Nigeria	82	69	55	107	12	48	41	101	94	76	99	86
Morocco	83	35	81	66	45	82	102	87	61	116	49	68
Mongolia	84	55	83	101	18	79	51	63	57	112	94	105
Uganda	85	80	59	5	108	55	100	77	100	53	105	82
Laos	86	60	108	3	49	42	80	103	75	108	96	106
Peru	87	65	54	76	110	56	62	31	85	113	74	109
Ghana	88	72	46	51	31	102	112	100	98	50	93	63
Turkmenistan	89	109	105	114	25	53	37	102	64	44	89	32
El Salvador	90	85	85	90	87	67	93	68	80	106	61	33
Pakistan	91	89	42	29	90	97	101	109	105	30	84	90
Togo	92	110	47	42	72	77	86	83	108	61	103	45
Cote d'Ivoire	93	66	74	116	36	58	81	96	112	14	91	93
Kenya	94	52	58	39	66	114	83	97	87	77	98	76
Mali	95	78	32	17	77	88	98	88	106	94	110	83
Viet nam	96	103	116	22	6	24	74	94	91	117	90	92
India	97	104	87	53	82	98	96	74	97	60	85	103
Cambodia	98	102	117	44	35	47	92	116	56	73	113	78
Yemen	99	79	109	67	38	73	94	113	111	74	100	60
Honduras	100	92	93	111	30	81	95	84	84	93	79	58
Gambia, The	101	116	67	100	56	90	107	91	96	31	95	29
Iran	102	45	106	72	89	115	104	89	93	35	88	57
Benin	103	115	50	95	107	83	65	95	79	83	109	50
Albania	104	75	78	73	101	99	103	112	103	111	71	36
Gabon	105	13	39	105	88	27	50	90	90	25	87	117
Guinea	106	81	91	75	102	105	108	111	110	29	111	77
Nepal	107	97	71	103	80	111	115	72	88	46	97	81
Mozambique	108	86	103	115	94	38	72	106	99	64	106	97
Mauritania	109	90	60	24	65	117	17	105	115	80	107	75
Sudan	110	98	92	28	114	72	105	117	113	55	101	96
Bangladesh	111	113	61	43	95	110	113	114	109	72	104	89

Table 3.3 (continued)

	MGI Rank	Embassies	Organisations	Military	Trade	FDI	Capital	Internet	Tourism	Mi-grants	Phone	Eco
Papua N. Guinea	112	106	90	30	48	66	52	115	107	105	108	115
Tanzania	113	71	86	117	96	84	111	107	101	54	114	85
Rwanda	114	95	84	12	115	112	117	92	116	81	117	66
Haiti	115	112	99	96	109	113	114	110	102	110	116	41
Madagascar	116	117	101	112	81	107	116	93	114	99	112	91
Burundi	117	108	102	104	117	116	110	104	117	82	115	70

Assumptions: Since there are missing data on the share of international linkages that are regional rather than global, it is impossible to distinguish globalisation from internationalisation and regionalisation with complete certainty. Therefore, there is an underlying assumption that countries with many international links have a correspondingly greater number of global linkages.

As expected, international statistics on eleven different indicators ranging from politics and military to the environment have widely varying degrees of data quality, reflecting the different capabilities and priorities of the organisations collecting the data. Of particular concern are the domains in which the underlying data have not been collected by official international bodies like the World Bank, IMF or UN, but by private or semi-public organisations (the complete list of sources is available in Appendix A). In addition, many countries are reluctant to share information about activities related to their national security, which creates data gaps that are not easily filled.

The fact that countries with fewer international linkages tend to publish less data and are less likely to be included in international statistics biases against states that are less globalised.¹⁵ Additionally, despite being members of the UN and most other international bodies, countries with totalitarian or communist economic systems (e.g., North Korea, Cuba) are often excluded in international financial statistics. Therefore, this also leads to their exclusion due to lack of data. Finally, yet importantly, countries that are too small to collect internationally coherent statistics and/or are strongly integrated into the economies of their big neighbours (e.g., Luxembourg, Monaco and Swaziland) are also missing from the statistics and therefore excluded from the MGI.

Robustness: Both the sensitivity to extreme values and year-to-year variations are a major concern for the robustness of the other indices. With the methodology used to construct the MGI, the sensitivity of the index to extreme values has been sharply reduced since the distribution is now centred on the mean of a component rather than just lying somewhere between the extreme values. Similarly, the strongest year-to-year variations are filtered by the averaging process for the

¹⁵ See Rosendorff and Vreeland (2006).

highly volatile components, sharply decreasing the dependence on the choice of base year in several component indicators.

The KOF Index: The KOF globalisation index was first published in 2002 (Dreher, 2006a).¹⁶ It is also partly based on the variables used in ATK/FP, but covers a far larger number of countries and has a longer time span. The KOF Index also adds neglected dimensions of globalisation.

The 2002 KOF Index covers 123 countries and includes 23 variables. The overall index covers the economic, social and political dimensions of globalisation. Globalisation is conceptualised as the process of creating networks among actors at multi-continental distances, mediated through a variety of flows including people, information and ideas, capital and goods.¹⁷ It is a process that erodes national boundaries, integrates national economies, cultures, technologies, governance and produces complex relations of mutual interdependence.

More specifically, the three dimensions of globalisation are defined as comprising of: *economic globalisation*, characterised by the long distance flows of goods, capital and services as well as information and perceptions that accompany market exchanges; *political globalisation*, characterised by the diffusion of government policies; and *social globalisation*, expressed as the spread of ideas, information, images and people.

Economic Globalisation: Broadly speaking, economic globalisation has two dimensions. First, actual economic flows are usually taken to be measures of globalisation. Second, the previous literature employs proxies for restrictions on trade and capital. Consequently, two indices are constructed which include individual components suggested as proxies for globalisation in the previous literature.

Actual Flows: The sub-index on actual economic flows includes data on trade, FDI and portfolio investment. Trade is defined as the sum of a country's exports and imports and portfolio investment is the sum of a country's assets and liabilities – each measure is normalised by GDP. Included are the sum of gross inflows and outflows of FDI (again, normalised by GDP).¹⁸ While these variables are straightforward, income payments to foreign nationals and capital are also included to proxy the extent to which a country employs foreign people and capital in its production processes.

International Trade and Investment Restrictions: The second sub-index refers to restrictions on trade and capital flows using hidden import barriers, mean tariff rates, taxes on international trade (as a share of current revenue) and an index of capital controls. Given a certain level of trade, a country with higher revenues from tariffs is less globalised. To proxy restrictions on the capital account, an

¹⁶ Since then, two updates have been presented in 2005 and 2006.

¹⁷ This is the approach suggested by Clark (2000), Norris (2000) and Keohane and Nye (2000), among others.

¹⁸ Data on trade and FDI flows are from World Bank (2002) and data for the stock of FDI are from United Nations Conference on Trade and Development's (UNCTAD) *World Investment Report*. Data on portfolio investment are from the IMF (2002)

index constructed by Gwartney and Lawson (2002) is employed.¹⁹ Mean tariff rates are obtained from various sources. Gwartney and Lawson assign a rating of 10 to countries that do not impose any tariffs. As the mean tariff rate increases, countries are assigned lower ratings. The rating declines toward zero as the mean tariff rate approaches 50 per cent (a threshold not generally exceeded by most countries in their sample). The original source for hidden import barriers is various issues of the World Economic Forum's *Global Competitiveness Report*, based on the survey question "*Hidden import barriers—no barriers other than published tariffs and quotas [are used]*".

Social Globalisation: The KOF Index classifies social globalisation in three categories. The first covers personal contacts, the second includes data on information flows and the third measures cultural proximity.

Personal Contacts: This index is intended to capture the direct interaction among people living in different countries. It includes international telecom traffic (outgoing traffic in minutes per subscriber), the average cost of a call to the United States and the degree of tourism (incoming and outgoing) a country's population is exposed to. Government and workers' transfers received and paid (as a percentage of GDP) measure whether and to what extent countries interact, while the stock of foreign population is included to capture existing interactions with people from other countries.

Information Flows: While personal contact data are meant to capture measurable interactions among people from different countries, the sub-index on information flows is meant to measure the potential flow of ideas and images. It includes the number of internet hosts and users, cable television subscribers, number of telephone mainlines, number of radios (all per 1,000 people) and daily newspapers (per 1,000 people). To some extent, all these variables proxy people's potential for receiving news from other countries – they thus contribute to the global spread of ideas.²⁰

Cultural Proximity: Cultural proximity is arguably the dimension of globalisation most difficult to grasp. According to Saich (2000, p. 209), cultural globalisation in large part refers to the domination of U.S. cultural products. Arguably, the United States is the trend-setter in much of the global socio-cultural realm (Rosendorf, 2000, p. 111). As proxy for cultural proximity, the number of McDonald's restaurants located in a country is included. For many people, the global spread of McDonald's is synonymous with globalisation itself.²¹

¹⁹ This index is based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions and includes 13 different types of capital controls. The index is constructed by subtracting the number of restrictions from 13 and multiplying the result by 10. The data for mean tariff rates and hidden import barriers are also from Gwartney and Lawson (2002).

²⁰ Data on the number of internet hosts are from the International Telecommunications Union's *Yearbook of Statistics* and its *World Telecommunication Indicators Database*. The other variables in this sub-index are from World Bank (2002).

²¹ See, e.g., Datum 9/06, <http://www.datum.at/0906/stories/2760960/> (accessed October 15, 2006).

Political Globalisation: To proxy the degree of political globalisation, ATK/FP is followed. That is, the number of embassies and high commissions in a country, the number of international organisations in which the country is a member and the number of UN peace missions a country participated in are used.

Method of Calculation: In constructing the indices of globalisation, each variable is transformed to an index with a zero to ten scale. Higher values denote more globalisation. When higher values of the original variable indicate higher globalisation, the formula $((V_i - V_{\min}) / (V_{\max} - V_{\min})) * 10$ is used for transformation. Conversely, when higher values indicate less globalisation, the formula is $((V_{\max} - V_i) / (V_{\max} - V_{\min})) * 10$. The weights for the sub-indices are calculated using principal components analysis. The year 2000 is used as the base year. For this year, the analysis partitions the variance of the variables used. The weights are then determined in a way that maximises the variation of the resulting principal component. Therefore, the index captures the variation as fully as possible. As Gwartney and Lawson (2001, p. 7) emphasise, this procedure is particularly appropriate when several sub-components measure different aspects of a principal component. The same procedure is applied to the overall index. If possible, the weights determined for the base year are then used to calculate the indices for each single year back to 1970. Where no data are available, the weights are readjusted to correct for this. All yearly indices are averaged over five years to avoid huge fluctuations due to changes in yearly data.

2007 KOF Index of Globalisation: An updated version of the original 2002 index is presented below. In most cases, this updating simply involves using the most recent data. The costs of a telephone call to the United States are no longer included in the index, however. This was done to avoid the criticism of this variable being overly-centred on the United States. The update also excludes the number of telephone mainlines, as nowadays these are not the best measure of international flows of information. Similarly, to enhance the international focus of the index, the number of newspapers sold is replaced by the number of newspapers imported and exported. In addition, a number of proxies for globalisation that are not included in the original 2002 index are included: FDI stocks, international letters sent and received, the number of Ikea outlets located in a country and trade in books and pamphlets. The number of international letters sent and received measure direct interaction among people living in different countries. Imported and exported books (relative to GDP) are used as a measure, as suggested by Kluver and Fu (2004). Traded books are intended to proxy the extent to which beliefs and values move across national borders. The number of Ikea outlets per country is motivated in a similar fashion to the number of McDonald's restaurants.

The 2007 index introduces a number of methodological improvements over earlier versions. Each of the variables introduced above is transformed to an index on a scale of one to one hundred, where one hundred is the maximum value for a specific variable over the period 1970–2004 and one is the minimum value. Higher values again denote greater globalisation. The data are transformed according to the percentiles of the original distribution. Compared to the previous

method, this has the advantage that a variable's actual weight in the index is not overly affected by its distribution. Consequently, the results are no longer driven by extreme outlying observations and missing values. The weights for calculating the sub-indices are determined using principal components analysis for the entire sample of countries and for all years. This is a methodological change compared with the construction of the 2002 KOF Index, where the weights were determined using data for the most recent period. Employing data for the whole period yields better comparability over time. As discussed above, one drawback is that the resulting globalisation index is affected by the inclusion of additional countries. The analysis again partitions the variance of the variables used in each sub-group and determines the weights in a way that maximises the variation of the resulting principal component. However, compared to the 2002 index, the weights are calculated using all data currently available instead of calculating them for the base year 2000. The same procedure is applied to the sub-indices in order to derive the overall index of globalisation.

Data for the 2007 index are calculated on a yearly basis. However, not all data are available for all countries and all years. In calculating the indices, all variables are linearly interpolated before applying the weighting procedure. Instead of linear extrapolation, missing values at the border of the sample are substituted by the latest data available.²² When data are missing over the entire sample period, the weights are readjusted to correct for this. As observations with value zero do not represent missing data, they enter the index with weight zero. Data for sub-indices and the overall index of globalisation are not calculated if they rely on a small range of variables in a specific year and country. Observations for the overall index are reported as missing if more than one-third of the underlying data are missing. The threshold for each of the economic, social and political sub-indices is 0.3, while those for each of the lower-level sub-indices is 0.2. The indices on economic, social and political globalisation as well as the overall index are calculated employing the weighted individual data series instead of using the aggregated lower-level globalisation indices. This has the advantage that the data enter the higher levels of the index even if the value of a sub-index is not reported due to missing data.

²² Note that this represents a methodological change with respect to the 2005 version of the index, where missing values have been only interpolated for hidden import barriers, mean tariff rates, capital account restrictions, number of embassies in a country, membership in international organisations, foreign population, costs of telephone calls to the United States and the number of McDonald's restaurants (see <http://globalization.kof.ethz.ch/>).

Table 3.4 Weights of variables in the 2002 KOF Index of Globalisation

Indices and variables	Weights (%)
A. Economic globalisation	(35)
(i) Actual flows	(50)
Trade (percentage of GDP)	(23)
Foreign direct investment (percentage of GDP)	(29)
Portfolio investment (percentage of GDP)	(27)
Income payments to foreign nationals (percentage of GDP)	(22)
(ii) Restrictions	(50)
Hidden import barriers	(20)
Mean tariff rate	(30)
Taxes on international trade (percentage of current revenue)	(24)
Capital account restrictions	(26)
B. Social globalisation	(38)
(i) Data on personal contact	(24)
Outgoing telephone traffic	(31)
Transfers (percentage of GDP)	(9)
International tourism	(1)
Telephone average cost of call to U.S.	(33)
Foreign population (percentage of total population)	(26)
(ii) Data on information flows	(39)
Telephone mainlines (per 1,000 people)	(18)
Internet hosts (per capita)	(15)
Internet users (share of population)	(18)
Cable television (per 1,000 people)	(16)
Daily newspapers (per 1,000 people)	(16)
Radios (per 1,000 people)	(17)

Table 3.4 (continued)

Indices and variables	Weights (%)
(iii) Data on cultural proximity	(37)
Number of McDonald's restaurants (per capita)	(100)
C. Political globalisation	(28)
Embassies in country	(34)
Membership in international organisations	(34)
Participation in UN Security Council missions	(32)

Note: The numbers in parentheses indicate the weight of the indices. Weights may not sum to 100 because of rounding.

Table 3.5 Weights of variables in the 2007 KOF Index of Globalisation

Indices and variables	Weights (%)
A. Economic globalisation	(36)
(i) Actual flows	(50)
Trade (percentage of GDP)	(16)
Foreign direct investment, flows (percentage of GDP)	(21)
Foreign direct investment, stocks (percentage of GDP)	(23)
Portfolio investment (percentage of GDP)	(19)
Income payments to foreign nationals (percentage of GDP)	(22)
(ii) Restrictions	(50)
Hidden import barriers	(24)
Mean tariff rate	(28)
Taxes on international trade (percentage of current revenue)	(28)
Capital account restrictions	(20)
B. Social globalisation	(38)
(i) Data on personal contact	(29)
Outgoing telephone traffic	(14)
Transfers (percentage of GDP)	(8)
International tourism	(27)
Foreign population (percentage of total population)	(25)

Table 3.5 (continued)

Indices and variables	Weights (%)
	International letters (per capita) (27)
(ii) Data on information flows	(35)
	Internet hosts (per 1,000 people) (20)
	Internet users (per 1,000 people) (24)
	Cable television (per 1,000 people) (20)
	Trade in newspapers (percentage of GDP) (14)
	Radios (per 1,000 people) (23)
(iii) Data on cultural proximity	(37)
	Number of McDonald's Restaurants (per capita) (40)
	Number of Ikea (per capita) (40)
	Trade in books (percentage of GDP) (20)
C. Political globalisation	(26)
	Embassies in country (35)
	Membership in international organisations (36)
	Participation in U.N. Security Council missions (29)

Note: The numbers in parentheses indicate the weight of the indices. Weights may not sum to 100 because of rounding.

The Results: The weights for the 2002 and 2007 sub-indices are presented in Tables 3.4 and 3.5. As can be seen, the methodological changes, new variables and data update do not substantially affect the weights of the individual dimensions of globalisation. This gives a first impression about the robustness of the KOF Index vis-à-vis the choice of method and data. The Tables show that economic and social integration obtain approximately equal weights (36 per cent and, respectively, 38 per cent in the 2007 index), while political globalisation has a substantially smaller weight in the overall index (26 per cent in the 2007 index). Regarding the 2007 economic sub-indices presented in Table 3.5, actual economic flows and restrictions are weighted equally. Within the sub-indices no single dimension dominates. Trade obtains the lowest weight in the actual flows index (16 per cent), while FDI stocks obtain the highest (23 per cent). The index of restrictions ranges from 20 per cent (capital account restrictions) to 28 per cent (mean tariff rate and taxes on trade). Turning to social globalisation, data on personal contact enter the sub-index with a weight of 29 per cent; information flows obtain 35 per cent and data on cultural proximity 37 per cent. Notably, transfers as a percentage of GDP

have a weight of only 8 per cent in the personal contact index. In the index of political globalisation, the three indicators have approximately equal weights.

Table 3.6 shows the results for the 2007 KOF Indices (referring to data for the year 2004).²³ As can be seen, the world's most globalised country is Belgium with a score of almost 92. This result is driven by high economic and social integration with the rest of the world. On the other hand, Belgium ranks only tenth when it comes to political integration. According to the Index, France has the highest political integration with the rest of the world, followed by the United States, Russia and the United Kingdom. Other countries ranking high on the overall index include Austria and Sweden. While Luxembourg, Singapore and Ireland are ranked first, second and third, respectively, in terms of economic globalisation, overall, they are ranked much lower. This is mainly due to their low political integration with the rest of the world. According to the political integration index, the Bahamas is the country with the lowest score. Table 3.6 also shows that the world's least globalised country is Burundi, with an index of less than 26. The country least integrated in economic terms is Iran, while Myanmar (formerly, Burma) has the lowest social globalisation score. Figure 3.3 shows the more globalised countries in a darker colour. The Figure shows that Western European and North American Countries are usually the most globalised, while countries in Sub-Saharan Africa are the least globalised. We return to this below.

²³ Note that – in contrast to the 2002 version of the index – Hong Kong, SAR is no longer included, so the 2007 index is available for 122 countries.

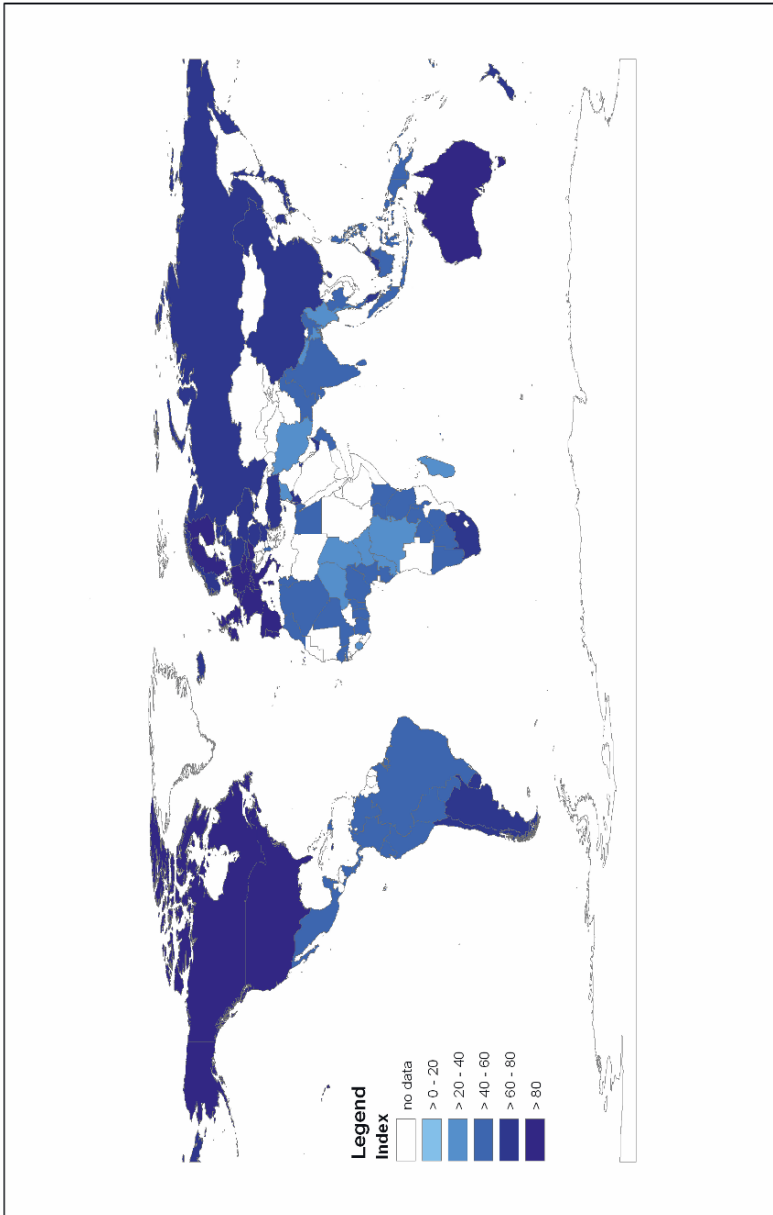


Figure 3.3 KOF Index of Globalisation 2007, map

Table 3.6 KOF Index of Globalisation 2007 Rankings

		Globalisation			Economic
	country	Index		country	Globalisation
1	Belgium	91.96	1	Luxembourg	98.49
2	Austria	91.60	2	Singapore	95.14
3	Sweden	89.89	3	Ireland	94.88
4	United Kingdom	89.29	4	Belgium	92.33
5	Netherlands	89.15	5	Estonia	92.05
6	France	87.71	6	Netherlands	90.18
7	Canada	87.49	7	Austria	88.65
8	Switzerland	85.53	8	Sweden	88.52
9	Finland	84.84	9	Portugal	86.81
10	Czech Republic	84.46	10	United Kingdom	86.12
11	Denmark	84.27	11	Bahrain	85.21
12	Ireland	83.09	12	Finland	84.62
13	Portugal	83.06	13	Czech Republic	84.46
14	Spain	82.52	14	Hungary	84.34
15	Germany	82.48	15	Chile	83.97
16	Singapore	82.14	16	France	83.95
17	Hungary	81.15	17	Malta	83.41
18	Australia	80.91	18	Canada	83.09
19	United States	80.83	19	Israel	83.07
20	Italy	80.61	20	Iceland	82.54
21	Poland	78.22	21	Spain	82.36
22	Norway	77.75	22	Switzerland	82.02
23	Malaysia	75.81	23	New Zealand	81.21
24	Greece	74.94	24	Italy	79.17
25	Luxembourg	74.18	25	Latvia	78.65
26	New Zealand	73.46	26	Panama	78.38
27	Slovak Republic	72.58	27	Australia	77.89
28	Estonia	72.11	28	Lithuania	77.29
29	Israel	70.83	29	Cyprus	77.28
30	United Arab Emirates	70.39	30	Denmark	77.04

Table 3.6 (continued)

Globalisation		Economic			
country	Index	country	Globalisation		
31	Russian Federation	69.91	31	Slovenia	76.08
32	Chile	69.91	32	Trinidad and Tobago	75.58
33	Croatia	69.30	33	Jamaica	75.02
34	Slovenia	68.82	34	Croatia	74.82
35	Iceland	67.75	35	Malaysia	74.70
36	Bulgaria	65.51	36	Greece	74.09
37	China	65.26	37	Poland	73.64
38	Korea, Rep.	64.82	38	Botswana	73.43
39	Jordan	64.74	39	United States	73.00
40	Japan	64.22	40	Germany	72.58
41	Argentina	64.12	41	Bulgaria	71.76
42	Malta	63.78	42	Norway	70.85
43	Kuwait	63.51	43	Slovak Republic	70.17
44	Turkey	63.45	44	Nicaragua	68.44
45	Romania	63.34	45	Guyana	68.16
46	Lithuania	63.30	46	El Salvador	67.46
47	Jamaica	62.87	47	Uruguay	65.13
48	Cyprus	62.48	48	Papua New Guinea	64.58
49	South Africa	62.45	49	Costa Rica	64.55
50	Ukraine	61.83	50	Belize	63.87
51	Uruguay	61.79	51	South Africa	63.78
52	Latvia	61.62	52	Turkey	63.64
53	Bahrain	60.93	53	Oman	63.40
54	Brazil	59.6	54	Romania	62.18
55	Philippines	59.00	55	China	61.21
56	El Salvador	58.03	56	Colombia	61.16
57	Panama	57.58	57	Philippines	60.91
58	Peru	57.12	58	Peru	60.73
59	Thailand	56.87	59	Jordan	60.38
60	Ghana	56.01	60	Brazil	60.16

Table 3.6 (continued)

Globalisation		Economic			
country	Index	country	Globalisation		
61	Mexico	55.49	61	Venezuela, RB	60.16
62	Costa Rica	55.00	62	Korea, Rep.	60.12
63	Ecuador	54.5	63	Kuwait	59.78
64	Egypt, Arab Rep.	54.18	64	Namibia	59.22
65	Honduras	53.99	65	Mexico	58.95
66	Namibia	53.79	66	Thailand	58.48
67	Venezuela, RB	53.75	67	Japan	58.36
68	Saudi Arabia	53.69	68	Argentina	58.30
69	Nigeria	52.97	69	Ecuador	57.71
70	Morocco	52.93	70	Dominican Republic	57.43
71	Pakistan	52.35	71	Zambia	56.46
72	Colombia	52.30	72	Uganda	56.29
73	Tunisia	51.81	73	Tunisia	55.73
74	Zambia	51.76	74	Ghana	55.55
75	Dominican Republic	51.72	75	Ukraine	55.20
76	Oman	51.67	76	Russian Federation	54.96
77	Nicaragua	51.63	77	Mali	54.93
78	Indonesia	51.31	78	Nigeria	54.50
79	Trinidad and Tobago	50.79	79	Barbados	52.46
80	Paraguay	50.33	80	Albania	51.66
81	Guatemala	49.98	81	Bolivia	51.57
82	India	49.70	82	Indonesia	51.42
83	Sri Lanka	49.67	83	Paraguay	51.14
84	Gabon	49.20	84	Chad	49.80
85	Kenya	49.12	85	Bahamas, The	48.66
86	Bolivia	49.11	86	Guatemala	48.43
87	Mauritius	48.75	87	Sri Lanka	48.17
88	Senegal	48.55	88	Togo	47.35
89	Fiji	48.53	89	Malawi	46.30
90	Bahamas, The	47.88	90	Madagascar	45.90
91	Guyana	47.38	91	Fiji	45.82
92	Belize	47.29	92	Zimbabwe	44.96

Table 3.6 (continued)

		Globalisation		Economic	
	country	Index	country	Globalisation	
93	Botswana	46.80	93	Egypt, Arab Rep.	44.53
94	Algeria	45.50	94	Cote d'Ivoire	44.00
95	Cote d'Ivoire	45.44	95	Algeria	43.92
96	Uganda	44.49	96	Kenya	43.53
97	Malawi	43.73	97	Pakistan	42.30
98	Barbados	43.45	98	Cameroon	42.05
99	Tanzania	43.22	99	Morocco	41.57
100	Mali	42.40	100	Haiti	41.51
101	Togo	42.23	101	Mauritius	40.36
102	Albania	42.01	102	Benin	40.22
103	Benin	41.73	103	Senegal	39.93
104	Papua New Guinea	41.55	104	Rwanda	37.71
105	Cameroon	41.32	105	India	36.17
106	Guinea-Bissau	40.68	106	Burundi	31.92
107	Zimbabwe	40.06	107	Niger	30.80
108	Chad	39.56	108	Bangladesh	29.52
109	Syrian Arab Republic	39.09	109	Iran, Islamic Rep.	25.34
110	Congo, Rep.	38.78	110	Tanzania	–
111	Madagascar	37.45	111	Congo, Dem. Rep.	–
112	Bangladesh	36.01	112	Guinea-Bissau	–
113	Congo, Dem. Rep.	35.49	113	Syrian Arab Republic	–
114	Nepal	35.27	114	Central African Republic	–
115	Iran, Islamic Rep.	35.19	115	Saudi Arabia	–
116	Niger	34.28	116	United Arab Emirates	–
117	Sierra Leone	33.27	117	Gabon	–
118	Rwanda	29.25	118	Congo, Rep.	–
119	Haiti	28.61	119	Nepal	–
120	Myanmar	27.29	120	Sierra Leone	–
	Central African Republic				
121	Republic	26.79	121	Honduras	–
122	Burundi	25.75	122	Myanmar	–

Table 3.6 (continued)

Social			Political		
	country	Globalisation		country	Globalisation
1	Austria	93.10	1	France	98.06
2	Singapore	92.49	2	United States	96.11
3	Belgium	90.66	3	Russian Federation	96.04
4	Netherlands	89.98	4	United Kingdom	95.76
5	Denmark	88.92	5	Canada	94.85
6	Sweden	88.52	6	Germany	94.61
7	Switzerland	88.43	7	Sweden	93.82
8	United Kingdom	87.88	8	Italy	93.55
9	United Arab Emirates	86.91	9	Austria	93.51
10	Canada	86.64	10	Belgium	93.37
11	Czech Republic	85.52	11	China	92.06
12	Iceland	84.98	12	Egypt, Arab Rep.	91.81
13	Norway	84.64	13	India	90.24
14	France	84.22	14	Spain	89.99
15	Finland	83.91	15	Poland	89.41
16	Germany	83.56	16	Denmark	87.47
17	Australia	82.78	17	Argentina	87.47
18	Kuwait	79.75	18	Japan	87.37
19	Luxembourg	79.29	19	Turkey	86.72
20	Israel	79.28	20	Netherlands	86.51
21	Slovak Republic	79.17	21	Finland	86.51
22	Portugal	77.86	22	Brazil	86.41
23	United States	77.82	23	Korea, Rep.	86.27
24	Ireland	77.65	24	Switzerland	86.13
25	Hungary	77.65	25	Nigeria	85.79
26	Spain	77.59	26	Portugal	85.50
27	Malta	76.22	27	Malaysia	85.39
28	Poland	74.92	28	Pakistan	85.12
29	Estonia	73.75	29	Romania	83.57
30	Italy	73.16	30	Greece	83.32

Table 3.6 (continued)

		Social			Political
	country	Globalisation		country	Globalisation
31	New Zealand	73.13	31	Czech Republic	82.90
32	Bahamas, The	71.92	32	Australia	82.35
33	Slovenia	71.78	33	South Africa	82.12
34	Saudi Arabia	71.33	34	Hungary	81.88
35	Cyprus	70.39	35	Jordan	79.37
36	Malaysia	70.36	36	Morocco	77.88
37	Greece	70.04	37	Indonesia	77.48
38	Latvia	69.51	38	Norway	77.19
39	Russian Federation	66.23	39	Ukraine	76.97
40	Croatia	65.15	40	Kenya	75.90
41	Jamaica	64.85	41	Philippines	75.87
42	Costa Rica	62.29	42	Algeria	75.61
43	Lithuania	62.07	43	Senegal	75.52
44	Bahrain	61.6	44	Chile	74.91
45	Mauritius	61.41	45	Ireland	74.76
46	Oman	59.84	46	Tunisia	74.02
47	Jordan	58.90	47	Peru	73.36
48	Ukraine	57.79	48	Bulgaria	72.27
49	Panama	57.76	49	Thailand	70.75
50	Fiji	55.73	50	Uruguay	70.59
51	Bulgaria	55.04	51	Bangladesh	70.59
52	Barbados	55.02	52	Ghana	70.20
53	Korea, Rep.	54.67	53	Croatia	67.77
54	Japan	54.01	54	Slovak Republic	66.20
55	El Salvador	53.99	55	Iran, Islamic Rep.	63.85
56	Belize	53.84	56	New Zealand	63.19
57	Argentina	53.73	57	Zambia	62.92
58	Chile	53.25	58	Bolivia	62.48
59	Uruguay	52.65	59	Sri Lanka	60.99
60	Nicaragua	51.75	60	Cote d'Ivoire	60.31

Table 3.6 (continued)

		Social			Political
	country	Globalisation		country	Globalisation
61	Mexico	50.97	61	Tanzania	59.91
62	China	50.84	62	Ecuador	59.20
63	Romania	50.67	63	Cameroon	57.90
64	Honduras	50.30	64	Mexico	57.33
65	Dominican Republic	50.26	65	Paraguay	57.26
66	Colombia	49.69	66	Nepal	56.69
67	Gabon	49.18	67	Benin	56.29
68	Venezuela, RB	48.70	68	Guatemala	55.93
69	Namibia	48.57	69	Slovenia	54.42
70	Ecuador	48.28	70	Niger	53.94
71	South Africa	47.81	71	Namibia	53.92
72	Turkey	47.46	72	Venezuela, RB	52.28
73	Guatemala	47.39	73	Mali	52.22
74	Ghana	46.79	74	El Salvador	50.92
75	Morocco	46.68	75	Congo, Dem. Rep.	49.49
76	Trinidad and Tobago	46.67	76	Singapore	48.92
77	Guyana	46.35	77	Togo	48.26
78	Thailand	45.92	78	Saudi Arabia	47.87
79	Philippines	45.74	79	Dominican Republic	45.98
80	Paraguay	44.85	80	Lithuania	45.72
81	Sri Lanka	43.39	81	Uganda	44.86
82	Peru	42.67	82	Kuwait	44.80
83	Malawi	42.07	83	Gabon	44.48
84	Botswana	41.88	84	Honduras	43.87
85	Zimbabwe	41.20	85	Colombia	43.86
86	Brazil	40.85	86	Albania	43.46
87	Zambia	39.74	87	Jamaica	43.10
88	Pakistan	39.53	88	Malawi	42.62
89	Senegal	38.34	89	Estonia	42.08
90	Bolivia	37.70	90	Mauritius	41.76
91	Egypt, Arab Rep.	37.69	91	Fiji	41.69
92	Cote d'Ivoire	36.68	92	Israel	41.42

Table 3.6 (continued)

		Social			Political
	country	Globalisation		country	Globalisation
93	Kenya	36.19	93	Chad	40.98
94	Papua New Guinea	35.94	94	United Arab Emirates	38.26
95	India	34.88	95	Madagascar	38.16
96	Indonesia	33.42	96	Syrian Arab Republic	37.59
97	Togo	33.31	97	Sierra Leone	33.21
98	Benin	33.26	98	Luxembourg	32.98
99	Uganda	33.11	99	Guinea-Bissau	31.76
100	Tunisia	33.02	100	Zimbabwe	31.59
101	Tanzania	32.66	101	Costa Rica	31.02
102	Congo, Rep.	31.98	102	Cyprus	30.34
103	Albania	31.94	103	Panama	28.50
104	Guinea-Bissau	31.52	104	Nicaragua	28.15
105	Rwanda	31.23	105	Latvia	26.43
106	Syrian Arab Republic	30.07	106	Bahrain	26.28
107	Cameroon	29.36	107	Oman	23.41
108	Nigeria	29.20	108	Trinidad and Tobago	22.50
109	Madagascar	29.01	109	Iceland	21.90
110	Burundi	28.96	110	Haiti	20.71
111	Chad	28.94	111	Congo, Rep.	20.71
112	Central African Republic	28.46	112	Guyana	20.11
113	Nepal	28.20	113	Malta	18.26
114	Sierra Leone	26.74	114	Myanmar	18.06
115	Algeria	26.52	115	Papua New Guinea	17.86
116	Iran, Islamic Rep.	25.00	116	Botswana	17.11
117	Congo, Dem. Rep.	24.92	117	Central African Republic	16.08
118	Niger	24.19	118	Belize	14.68
119	Mali	23.91	119	Rwanda	14.60
120	Haiti	21.83	120	Barbados	13.96
121	Bangladesh	18.63	121	Burundi	12.50
122	Myanmar	10.24	122	Bahamas, The	11.44

Table 3.7 contains the overall 2007 KOF Index of Globalisation in five-year intervals and the changes from 1970 to 2004, where the countries are ranked by the index value of 2000–2004. According to the Table, globalisation increased markedly over the 30 years under study. For each country included in the sample, globalisation increased. For many countries, the increases were substantial. The biggest increase was experienced by Portugal (+38.5), followed by China and Hungary (+38.4), while the increase has been smallest in Barbados (+3.2) and Luxembourg (+3.6). Note that, when averaging the data over five year periods, the Netherlands top the rankings with an Index score of almost 92, while Rwanda is the least globalised country (9.22).

Table 3.7 KOF Index of Globalisation 2007, 5-year averages

country	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04	Δ 1970–04
Netherlands	64.67	70.25	79.00	79.89	83.41	87.78	91.99	27.32
Sweden	57.54	65.05	67.19	74.64	82.66	88.49	91.20	33.66
United Kingdom	57.68	64.56	69.05	72.80	80.36	86.70	91.09	33.40
Belgium	68.65	69.35	74.62	82.85	85.97	88.64	90.96	22.31
Austria	55.45	57.55	69.70	70.27	77.99	83.77	90.70	35.25
Denmark	64.35	66.13	64.55	72.67	77.49	85.78	90.38	26.03
Switzerland	65.40	70.93	77.04	79.63	81.98	84.84	89.06	23.65
Canada	68.11	71.22	78.75	77.24	79.34	85.54	89.00	20.89
France	56.21	56.50	63.25	70.03	76.32	82.42	88.56	32.34
Germany	50.37	59.04	60.54	66.73	74.40	73.87	87.39	37.01
Finland	49.01	52.25	57.12	61.37	66.24	75.78	86.95	37.94
Norway	61.42	64.46	66.72	65.63	76.18	81.07	83.30	21.88
Spain	44.62	45.26	50.17	57.36	68.27	75.60	82.62	38.00
Italy	52.20	52.27	53.20	58.61	67.06	74.16	81.90	29.70
Ireland	55.05	61.85	65.84	67.06	70.13	78.34	81.54	26.49
United States	56.20	60.36	62.22	68.04	70.69	78.30	81.11	24.92
Czech Republic	–	–	–	–	–	72.02	80.26	–
Singapore	54.62	57.86	66.11	64.92	70.86	77.82	79.96	25.34
Australia	47.09	54.87	52.83	64.46	70.83	76.29	79.94	32.84
Hungary	39.63	46.34	49.98	48.60	62.07	74.50	78.04	38.40
Portugal	38.39	42.05	45.57	48.05	53.46	66.35	76.93	38.54
New Zealand	45.67	49.08	54.88	55.07	57.48	69.08	72.20	26.53
Poland	36.37	43.38	47.91	40.67	48.76	64.92	71.38	35.01

Table 3.7 (continued)

country	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04	Δ 1970–04
Slovak Republic	–	–	–	–	–	59.42	70.45	–
Luxembourg	66.73	66.80	67.03	66.86	66.33	74.03	70.36	3.63
Greece	40.27	41.66	43.90	44.34	48.63	61.76	69.89	29.61
Russian Federation	–	–	–	–	39.59	55.28	68.18	–
Malaysia	38.44	40.25	45.22	47.57	56.17	62.87	67.14	28.70
United Arab Emirates	45.77	41.30	44.64	45.09	48.55	68.52	66.36	20.58
Chile	39.31	42.18	44.12	44.00	52.12	60.55	66.21	26.91
Israel	47.41	47.89	46.81	47.16	46.74	56.07	65.19	17.78
Estonia	–	–	–	–	–	55.65	65.03	–
Argentina	41.93	43.04	44.62	43.54	47.77	61.32	64.90	22.96
Iceland	36.13	39.52	42.22	49.89	48.32	58.16	64.68	28.55
Japan	33.98	45.81	42.77	46.08	55.24	57.31	62.44	28.46
Jordan	28.20	33.70	36.20	39.05	45.72	47.62	61.42	33.22
Malta	41.47	42.95	45.98	39.24	39.64	52.63	61.21	19.74
South Africa	31.38	31.41	38.83	33.31	35.95	45.96	60.86	29.49
Turkey	29.65	30.14	28.82	32.17	41.46	55.92	60.35	30.71
Korea, Rep.	27.60	29.55	34.40	32.29	45.18	47.89	60.27	32.68
Venezuela, RB	30.19	37.25	37.83	42.91	49.10	57.07	59.90	29.71
Slovenia	–	–	–	–	–	47.12	59.57	–
Panama	38.98	51.44	49.98	46.71	51.88	53.36	58.52	19.54
Bulgaria	29.49	32.29	37.03	35.28	36.05	47.97	58.49	29.00
Romania	26.32	29.85	32.31	32.24	29.63	47.16	57.82	31.50
Kuwait	36.44	40.03	44.31	52.12	56.86	62.58	57.72	21.28
China	19.01	22.54	23.35	27.37	38.03	47.77	57.42	38.41
Bahrain	–	44.47	45.33	45.38	47.63	54.71	57.26	–
Brazil	33.80	34.49	39.58	38.96	38.94	53.62	57.19	23.39
Croatia	–	–	–	–	–	37.06	56.95	–
Ukraine	–	–	–	–	–	39.98	56.28	–
Thailand	21.90	23.65	24.50	31.07	39.30	46.84	55.92	34.02
Mexico	34.86	35.57	36.94	38.73	45.21	59.99	55.80	20.94
Costa Rica	32.14	36.45	39.82	42.87	49.49	45.87	55.55	23.42
Cyprus	34.06	35.75	37.70	36.12	37.35	46.87	55.38	21.32
Jamaica	31.78	34.38	40.79	39.82	45.92	55.25	55.06	23.28

Table 3.7 (continued)

country	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04	Δ 1970–04
Uruguay	44.11	42.93	39.55	41.35	41.27	51.34	54.92	10.81
Saudi Arabia	29.19	31.92	32.45	46.37	45.45	51.29	53.97	24.78
Latvia	–	–	–	–	–	43.92	53.70	–
Lithuania	–	–	–	–	–	42.02	53.23	–
Peru	23.31	30.90	28.50	29.28	34.32	38.25	52.93	29.62
Nigeria	22.38	28.06	28.37	34.68	44.84	48.16	52.51	30.13
Indonesia	18.22	25.38	25.83	25.80	34.40	46.39	51.85	33.64
Oman	35.01	42.52	42.11	42.79	45.12	45.00	51.76	16.76
Trinidad & Tobago	36.63	36.61	43.81	35.49	42.47	57.01	51.67	15.04
Philippines	22.33	24.59	26.95	33.20	36.30	40.54	51.44	29.11
Nicaragua	26.07	28.44	27.66	26.86	30.54	39.89	50.94	24.88
Egypt, Arab Rep.	17.34	32.25	32.19	36.43	42.00	52.53	50.82	33.48
Colombia	25.59	28.81	29.21	32.30	37.41	50.49	50.64	25.06
Tunisia	32.58	37.51	40.44	38.61	44.71	48.03	50.50	17.92
Bolivia	27.44	31.66	37.07	34.64	33.98	40.05	50.43	22.99
Guyana	28.04	31.45	36.22	34.45	38.26	46.82	49.01	20.97
Ecuador	25.07	28.00	29.12	30.87	37.61	43.37	48.93	23.86
Ghana	26.18	33.79	34.11	32.14	36.35	39.87	48.88	22.70
Senegal	24.77	33.67	31.51	31.26	34.35	39.52	47.00	22.23
Namibia	36.42	36.60	37.03	39.61	40.11	44.77	46.29	9.86
Fiji	30.26	29.44	39.84	38.95	41.27	41.76	46.12	15.86
Bahamas, The	–	38.96	37.98	36.10	36.48	47.13	45.57	–
Zambia	27.07	30.90	32.98	33.92	41.27	35.79	45.57	18.49
Sri Lanka	13.76	20.65	27.47	24.33	24.91	29.05	45.54	31.78
Morocco	25.34	30.96	34.90	36.18	35.89	44.56	45.44	20.10
El Salvador	24.97	33.82	34.05	34.09	31.49	36.58	45.26	20.28
India	23.37	24.98	29.21	29.18	32.40	37.95	44.57	21.20
Kenya	25.56	28.73	29.76	29.73	35.62	43.36	44.38	18.82
Honduras	20.51	25.02	26.09	27.14	30.31	45.40	43.88	23.37
Cote d'Ivoire	23.62	27.30	29.22	32.34	33.24	38.03	43.80	20.18
Pakistan	22.40	24.53	24.37	23.56	31.72	38.53	43.77	21.37
Paraguay	17.96	24.36	23.32	22.02	24.94	30.57	43.36	25.40
Botswana	31.13	32.17	39.89	39.27	37.19	41.49	43.27	12.14

Table 3.7 (continued)

country	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04	Δ 1970–04
Dominican Rep.	24.13	26.27	27.16	26.42	27.42	31.68	42.51	18.38
Algeria	28.29	33.14	34.62	31.58	35.04	40.60	42.20	13.91
Gabon	32.31	36.06	38.72	40.84	43.07	39.26	41.61	9.30
Guatemala	28.74	32.54	32.12	29.31	32.36	39.24	41.40	12.66
Belize	–	–	–	–	36.42	42.76	41.26	–
Togo	22.81	28.44	35.45	34.98	36.53	37.19	40.81	18.00
Mauritius	25.79	28.27	28.59	29.26	32.36	35.67	39.36	13.56
Barbados	34.83	36.46	33.84	35.72	34.33	41.64	37.99	3.17
Tanzania	22.00	24.78	26.25	25.45	26.62	35.24	37.81	15.80
Syrian Arab Republic	17.71	22.47	24.47	25.76	34.01	33.34	37.67	19.96
Benin	12.23	15.11	21.13	20.54	26.38	31.83	37.43	25.20
Papua New Guinea	28.23	28.76	35.13	32.60	34.60	34.27	37.12	8.89
Zimbabwe	18.11	17.94	19.47	24.90	26.71	42.25	36.97	18.85
Congo, Rep.	25.24	25.53	29.65	31.89	32.30	36.32	36.90	11.66
Cameroon	20.99	24.95	29.39	34.87	29.83	30.05	36.54	15.54
Malawi	26.47	27.34	31.07	30.95	33.45	30.44	35.48	9.00
Guinea-Bissau	19.68	16.96	21.85	22.24	27.78	38.25	34.60	14.92
Uganda	19.66	23.79	18.50	20.35	21.76	27.24	33.97	14.31
Albania	16.29	17.90	18.14	15.74	16.64	31.32	33.94	17.66
Mali	16.09	17.85	18.13	19.39	21.06	32.75	32.99	16.90
Iran, Islamic Rep.	21.85	26.14	22.38	19.39	22.56	25.03	31.21	9.35
Congo, Dem. Rep.	19.27	19.80	21.33	24.68	31.38	32.66	30.92	11.65
Chad	18.35	20.50	19.43	22.04	21.42	27.03	30.85	12.50
Bangladesh	7.32	9.86	14.12	12.29	19.38	23.05	30.33	23.00
Niger	18.89	25.96	29.26	25.65	27.03	28.19	29.55	10.66
Nepal	13.42	16.04	20.94	16.44	19.00	24.72	29.25	15.83
Madagascar	15.84	15.84	15.69	15.78	18.24	20.89	27.91	12.08
Central African Republic	16.13	17.94	19.64	20.90	19.08	27.49	26.05	9.93
Burundi	12.74	14.57	16.76	14.24	15.98	15.72	25.06	12.31
Myanmar	15.63	15.57	15.64	16.91	18.06	21.55	24.24	8.61
Haiti	14.88	17.85	19.99	19.20	17.52	22.29	23.87	8.99
Sierra Leone	16.79	19.51	20.95	15.63	25.84	18.71	23.20	6.41
Rwanda	12.46	15.08	17.06	15.07	14.38	18.07	21.68	9.22

The evolution of globalisation as measured by the KOF Index is depicted in Figures 3.4 to 3.9. Figure 3.4 shows the development of the overall index averaged over all countries. As can be seen, globalisation has been more pronounced in the later decades. The overall index rose continuously, starting from a value of about 32 to almost 60 in 2004. Economic globalisation evolved similarly over time (Figure 3.5), while social and political globalisation rose less steadily (Figures 3.6 and 3.7).²⁴

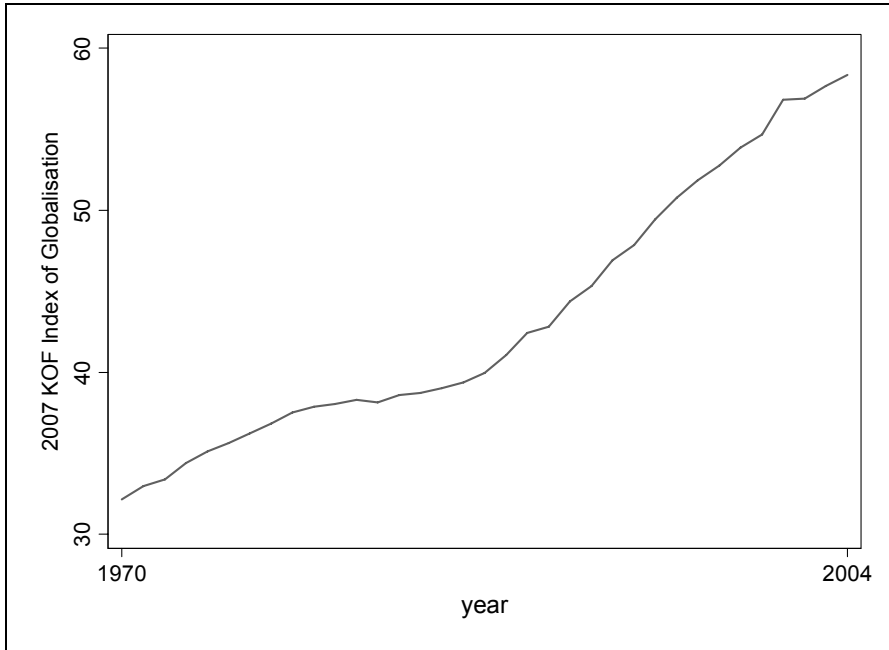


Figure 3.4 2007 KOF Index of Globalisation

²⁴ The correlation between economic globalisation and social globalisation is 0.85, that between economic globalisation and political globalisation 0.34 and that between social and political globalisation 0.46.

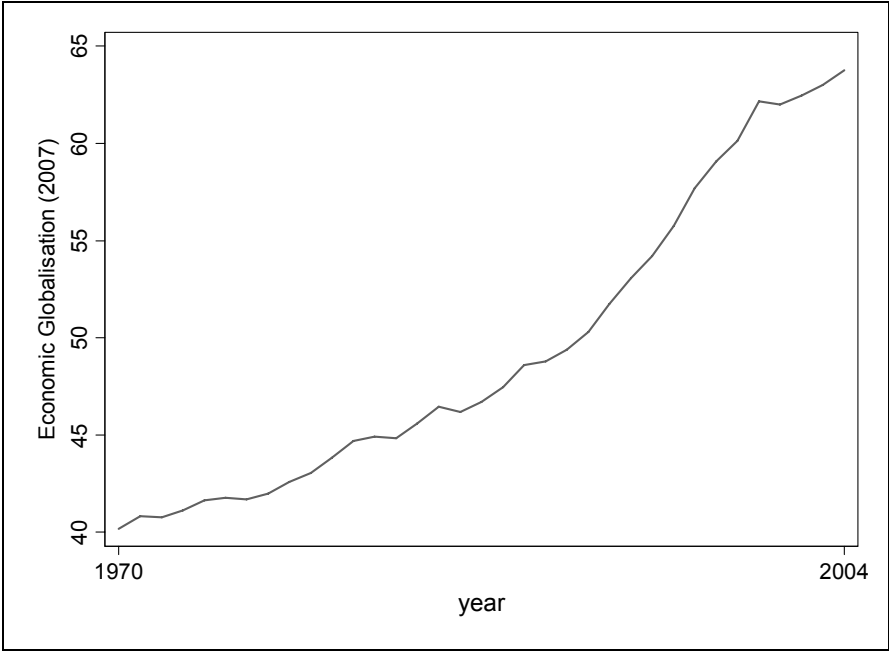


Figure 3.5 Economic globalisation

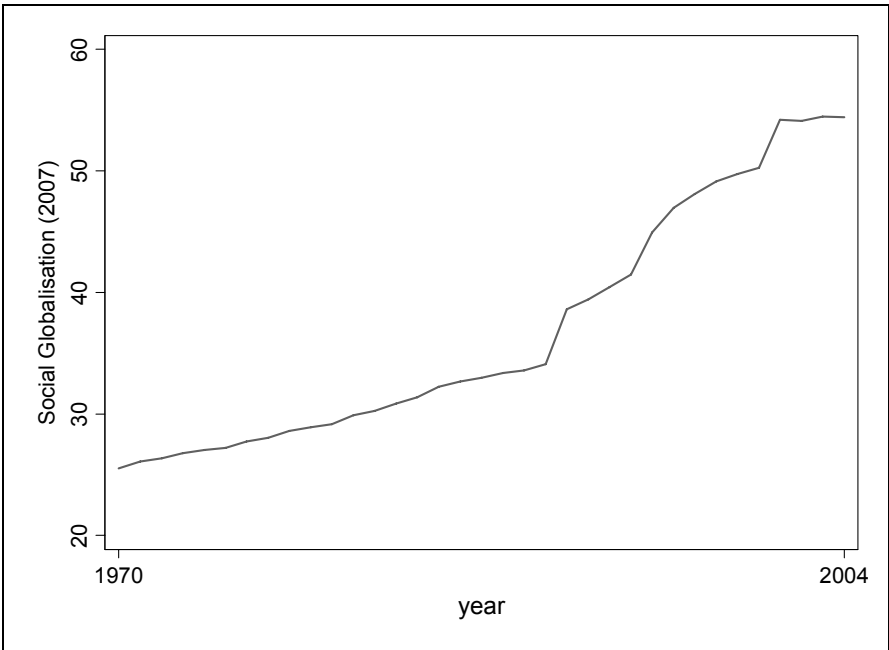


Figure 3.6 Social globalisation

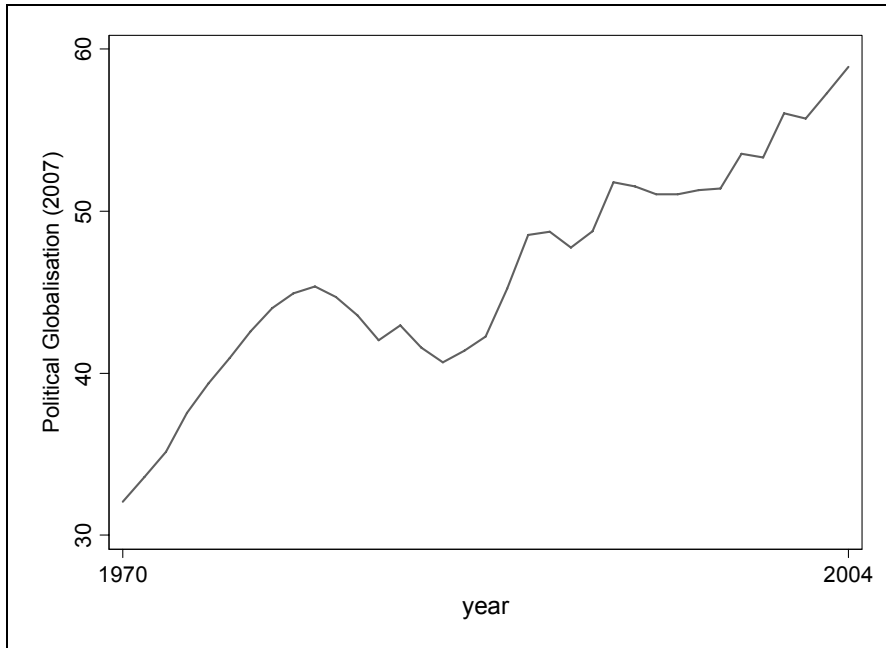


Figure 3.7 Political globalisation

Figures 3.8 and 3.9 display the pattern of the overall globalisation index by region and income. While in the last 30 years globalisation has been pronounced in all regions, some regions are more globalised than others. In particular, Western European and other industrialised countries display the greatest integration, South Asia and Sub-Saharan Africa are the regions least globalised. As can be seen, high income OECD countries are, on average, the most globalised, while low income countries are the least globalised.

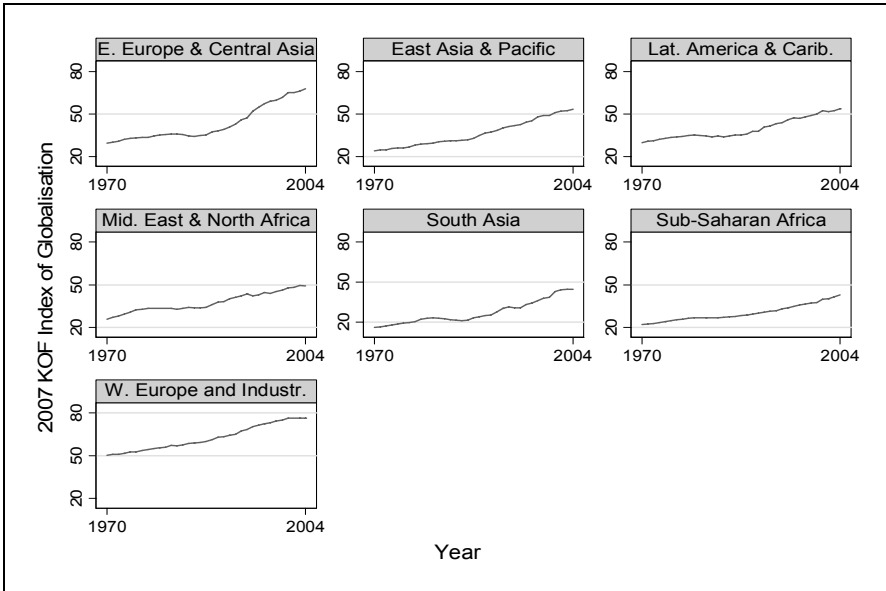


Figure 3.8 Development of globalisation across regions

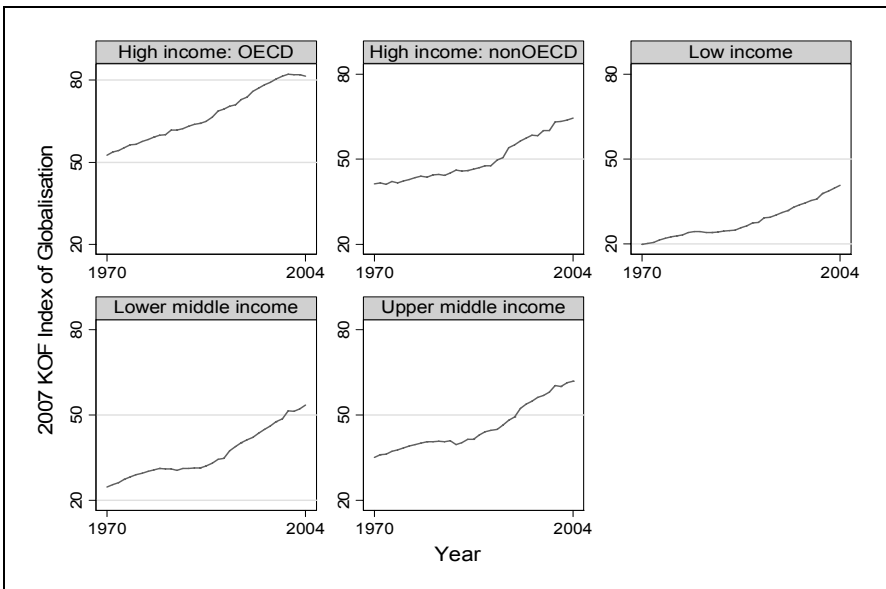


Figure 3.9 Development of globalisation according to income

Overall, the index suggests that some countries are systematically more globalised than others. In particular, richer countries seem to be, on average, more globalised than poorer ones. Western industrialised countries are also more globalised than the average country. The average OECD country is far more globalised than the average non-OECD country.

3.4 Comparing the main indices

Any assessment of the relevance of the existing indices must consider the different definitions of globalisation used. To facilitate comparison, the MGI, WMRC, ATK/FP and KOF indices appear side-by-side in Table 3.8. As the Table indicates, the WMRC G-index includes primarily economic factors; the ATK/FP index does so as well by an a priori weighting scheme that heavily favours economic factors. Moreover, with these indices, globalisation is indistinguishable from internationalisation and liberalisation. This is not to say that data collected with the country as the relevant territorial unit of analysis are useless. However, the assumptions made and the limitations of using these data for the measurement of globalisation should be clearly stated – something which both indices fail to do. Further, it should be noted that any measurement of globalisation should be defined within the broader context of all countries. With coverage of 185 countries, the WMRC index is clearly closer to achieving this objective than the ATK/FP index with its 62 countries.

Many authors examining the measurement of globalisation concur with the view that “*culture is the most visible manifestation of globalisation*” (Kluver and Fu, 2004). However, despite culture’s importance to globalisation, no-one has developed an adequate solution to its measurement. Martens and Zywiets (2006) side-step the issue by stating that the concepts of culture and communication have intractable ambiguities and are difficult to properly quantify.

Kluver and Fu (2004) construct a Cultural Globalisation Index. They argue that it is impossible to directly measure the diffusion of cultural values and ideas across national borders. So they use cultural proxies: “the conduits by which ideas, beliefs and values are transmitted”. Although cultural globalisation is adequately conceptualised, the available empirical measures once again fall short. The authors use the imports and exports of books and brochures, newspapers and periodicals because all other possible indicators lack systematic data sources. Countries at the top of the cultural rankings are generally affluent and English-speaking.

One danger of the failure to measure cultural factors is the risk of dismissing the importance of culture. That is, it is tempting to ask why something about which we know so little should be discussed. Notwithstanding, it would be useful if the publication of the indices include some discussion of cultural globalisation.

Table 3.8 Comparison of the main globalisation indices

Category	Sub-category	WMRC G-index 2001	ATK/FP 2002	MGI	KOF 2007
Relevance	Definition of globalisation used	Very narrow, only economic	Medium	Very broad	Very broad
	Differentiation of globalisation from internationalisation	No differentiation	No differentiation	No differentiation	No differentiation
	Type of change measured	Extensivity, intensity	Extensivity, intensity	Extensivity, intensity	Extensivity, intensity
	Geographical adjustment	No	No	Yes	No
	Coverage	185 countries	62 countries	117 countries	122 countries
	Correlation with economic development	Low	High	High	High
Robustness	Sensitivity to extreme values	Method not published	High (cross-panel normalisation)	Low	Low
	Sensitivity to year-to-year data variations	Very high (exclusive use of strongly fluctuating indicators)	High (some indicators with lower fluctuation)	Low (indicators with high fluctuations are averaged)	High (some indicators with lower fluctuation)
	Method for determining weights	A priori, with normative discussion	A priori, with normative discussion	Equal weights	Principal components analysis
Added value	Correlation with own components	High	Low	Some	Some
	Correlation among components	Not published	Not published	Moderate	Moderate
Transparency	Transparency of methodology	Moderate	High	High	High
	Data published	Partially	Yes	Yes	Yes

The KOF Index includes some cultural indicators in the “social globalisation” sub-index. The indicators that have been included are the number of McDonald’s restaurants per capita, the number of Ikea outlets per capita and the number of books traded (as a percentage of GDP). This sub-index can indicate the extent to which cultural globalisation matters for economic and social phenomena. We return to this below.

Rather inevitably, the “top ten” countries in the leading indices are usually lauded. An exception to this is the MGI because it has integrated two variables – the environment and organised violence – that change the meaning of the overall outcome. Notwithstanding, it is useful to consider what it means to be at the top, middle or bottom of a globalisation ranking.

The inclusion of new indicators that cannot be considered “positive” changes the discussion about a country’s ranking according to an index. For example, if the Netherlands ranks highly in every index of globalisation is that something to be applauded? It does imply, of course, that this country has many linkages with the world outside its national borders. According to the MGI, the Netherlands, e.g., ranks fourth in both the overall rank and in the environmental rank. It is placed fortieth in the “organised violence” rank. This implies that the Netherlands has a large ecological footprint and relatively intense trade in conventional arms. It also scores well in other areas such as capital flows, trade, FDI and telephone traffic.

A large ecological footprint implies a large ecological deficit, which needs to be compensated for by “space” outside the country’s territory. In this way, the growth in transport, for instance, is connected to the exploitation of natural resources (Martens and Rotmans, 2005). So while this helps to elevate the Netherlands to the top ranking of this globalisation index, it also raises questions about the relationship between globalisation, economic growth and the environment. Unlike the other variables in the globalisation index, the environmental factor appears to be a consequence of globalisation rather than a driving force. However, as the globalising processes intensify over time, the “*indirect impacts of human-induced disruption of global biogeochemical cycles and global climate change start to become apparent*” Martens and Rotmans (2005, p. 1137).²⁵

If consumerism and global economic processes do have polluting side-effects, it needs to be asked which direction these dynamics need to take for a sustainable future. With the environment integrated into the index, the long-existing “environment versus growth” tension can be exposed, for which the term “sustainable development” has been coined (Dresner, 2002, pp. 1–2; Martens and Rotmans, 2005, p. 1134). The demands for environmental protection and economic development are said to be competing. Some claim an eternal competition, while others emphasise a possible win-win situation (van Kasteren, 2002, p. 194).

²⁵ See also Rennen and Martens (2003).

Since globalisation implies inter-connectedness and complexity, its various aspects need to be considered. The environment cannot be treated separately from everything else that is supposedly global. Moreover, an integrated index of globalisation can stimulate a new framework of analysis for the market system, recognising the need to incorporate ecological costs into trade and consumption (van Kasteren, 2002, p. 190).

The inclusion of trade in conventional arms in the MGI also serves to highlight such trade. Do global mechanisms promote production and open gateways to trade in arms? Clearly the issue is a complicated one involving economic costs and benefits, political risk, social tensions and ethical values. While such issues are a long way from being resolved, the way the addition of such indicators influence the relevance of a measurement of globalisation needs to be emphasised.

An important criticism of many indices, such as the MGI and the ATK/FP, is that, strictly speaking, they measure internationalisation and regionalisation rather than globalisation. For example, the MGI's "top ten" is composed of European nations which reinforces an impression of increased regionalisation.²⁶

All indices have component indicators and data that fail to distinguish between globalisation and internationalisation (or liberalisation) to some degree. They also fail to include supra-territorial indicators. For example, while the number of embassies a country has abroad may mirror increasing co-operation and even integration, these data have a territorial base.

Even leaving the problem of "methodological territorialism" to one side, the epistemology of globalisation makes us doubt the possibility of measuring it. This highly complex phenomenon is not easily quantifiable. Globalisation occurs at levels that make measurement difficult, e.g., trans-border environmental issues, cultural transformations and a so-called "global consciousness". Those features of globalisation are obviously interesting and new to us which, in turn, is one reason why they are so difficult to capture.

One possible solution is to assess globalisation by thematic order. For example, the globalisation of world-wide politics can be measured, with the further possibility of making regional comparisons. Caselli (2006) argues that the level of globalisation of cities can be measured. Obviously, cities play a central role in the global economy, political systems and culture. Caselli refers to Bauman's idea of a new class division between the globalised upper classes and the localised lower classes. This leads to the proposal to measure globalisation along individual lines or according to demographic groups.²⁷ The number of supra-territorial institutions,

²⁶ A possible solution to the difficulty associated with delineating globalisation and internationalisation is to subtract regional flows or flows from neighbouring countries from total flows. This method is proposed by Caselli (2006, p. 17). However, the issue about how to define regions arises. For example, to which region does Turkey belong?

²⁷ Caselli (2006, pp. 20–1) also recognises that "risk" is a binding factor, but that it is impossible to measure except for the planet itself. Since risk and globalisation coincide on many issues (e.g., the over-exploitation of natural resources and nuclear arms proliferation), risk cannot be sensibly measured.

both formal and informal, could be included but, once again, the problem arises of reconciling these trans-border results with country-based indices.

The “qualitative” side of research generally focusses on multi-dimensional analyses of globalisation by constructing frameworks and concepts. This is useful, but does not provide a solid scientific footing with which to evaluate the overarching phenomenon of globalisation. On the other hand, the “quantitative” side of research by concentrating on data, statistics and indices runs the risk of oversimplification.

As we have argued, to confront new questions on the essential nature of globalisation requires an interdisciplinary approach. Sociologists, critics of science and technology, economists and others need to work on different dimensions of the same questions. Globalisation (as other complex issues do) requires academics and professionals alike to step outside their disciplinary boundaries. In our view, there is a possibility of bridging this gap. A composite index of globalisation can reconcile multi-faceted approaches. An index needs matters to be conceptually analysed and formulated and this leads to the issue of measurement. Instead of objecting to the possibility of adequately measuring globalisation, a certain degree of optimism is vital for making the improvements in measurement, which are necessary to advance an understanding of the globalisation phenomenon.

Operational Issues: Apart from the conceptual critique, the methods used for calculating the indices are open to criticism on several fronts. The primary concern relates to the robustness of the results. Both the sensitivity to extreme values and year-to-year variations are a major concern for the robustness of the other indices. The sensitivity of the MGI to extreme values has been sharply reduced, as the distribution is now centred on the mean of a component rather than being somewhere between the extreme values. Similarly, the strongest year-to-year variations are filtered by the averaging process for the highly volatile components, sharply decreasing the dependence on the choice of base year in several component indicators. Similarly, the 2007 KOF Index imputes missing values, making the results independent of missing data and substantially smoothing the index over time as compared, for example, to the 2002 KOF Index.

Most globalisation indices employ subjective a priori weights, which are difficult to justify theoretically. Additional distortions are introduced by the fact that the values of the indicators used centre on different means with different variances, which again influences the weights. The choice of the normalisation method, which in turn influences the extreme values, also affects the relative weights of the indicators, further reducing robustness.

In addition, the ATK/FP, WMRC and (recent) KOF indices use single-year figures for all indicators. This is not a problem when indicator values typically change slowly or exhibit a clear trend (life expectancy, for example, typically does not change by more than a few percentage points per annum). However, in cases where the figures are highly volatile this introduces additional uncertainty. Some of the economic variables such as FDI and capital flows are particularly problematic since they can be very volatile (with variations of up to 200 per cent from one

year to the next). Also, the influence of existing stocks, which are not included in the ATK/FP and WMRC indices, might be as important to globalisation as the current flows (as in the example of FDI). The importance that is accorded to the choice of the measurement period only underscores the doubts about the robustness of both indices.

Knowing that the different published indices are not fully comparable, an inspection of the top ten lists of the five indices presented in Table 3.9 shows some interesting similarities, while also displaying some equally interesting differences. The Table includes ATK/FP, WMRC, MGI and the 2002 and 2007 KOF Indices. As can be seen, only two countries – Switzerland and Sweden – are in the group of the world’s ten most globalised countries according to all indices. Still, the rankings are quite similar, with most of the same countries appearing in two or three of the rankings displayed in the Table. The results also show that the WMRC seems biased in favour of smaller countries (four of the WMRC top ten countries are not included in either of the other indices).

Table 3.9 Ten most globalised countries across indices

2006 ATK/FP	WMRC (2001)	MGI	2002 KOF Index	2007 KOF Index
Singapore	Liechtenstein	Switzerland	United States	Belgium
Switzerland	Singapore	Austria	Canada	Austria
United States	Belgium	Belgium	Sweden	Sweden
Ireland	Ireland	Netherlands	Denmark	United Kingdom
Denmark	United Arab Emirates	United Kingdom	Finland	Netherlands
Canada	Switzerland	Sweden	Luxembourg	France
Netherlands	Netherlands	Czech Republic	United Kingdom	Canada
Australia	Cayman Islands	Germany	Switzerland	Switzerland
Austria	Sweden	Hungary	France	Finland
Sweden	Hong Kong, SAR	Ireland	Belgium	Czech Republic

Calculating the rank correlations between the five indices shows that, at least to some extent, the five indices considered measure similar concepts (Table 3.10). The correlation is highest between the 2002 and, respectively, 2007 KOF Indices of globalisation. However, rank correlations are never below 0.68, giving some confidence in all of these indices of globalisation.

Notwithstanding, there are noticeable differences between the indicators and their components when certain sections of the ranking are considered. Following Noorbakhsh (1998a), the full sample is divided into subsets and compared to the performance of the different indicators for each of these subsets of countries. This analysis revealed correlations that are higher in the “top group” than in the others, showing that the results are less robust across a specific subset of countries.

Table 3.10 Rank correlation across indices of globalisation

	2002 KOF Index	2007 KOF Index	2006 ATK/FP	MGI	WMRC (2001)
2002 KOF Index	1				
2007 KOF Index	0.92	1			
2006 ATK/FP	0.69	0.81	1		
MGI	0.85	0.91	0.83	1	
WMRC (2001)	0.68	0.75	0.87	0.83	1

Finally, in any such undertaking the methodology should be clear and transparent to facilitate open discussion. While the ATK/FP, KOF Index and MGI provide methodological details, the WMRC is missing crucial information, giving no clues as to how the score values are calculated (such as the choice of extreme values).

4 CONSEQUENCES OF GLOBALISATION RECONSIDERED: APPLYING THE KOF INDEX

Arguably, the first step in quantifying the consequences of globalisation is the ability to measure globalisation itself. With the introduction of the KOF Index of Globalisation in 2002, a number of studies empirically addressed the question of whether and to what extent globalisation affects social and economic phenomena.²⁸ Among the first to use the KOF Index for empirical analysis was Ekman (2003) who investigated whether globalisation affects the health of a country's population. He finds a positive, non-linear correlation between the KOF Index and population health as measured by life expectancy at birth. In later studies, Sameti (2004) finds that globalisation increases the size of governments, while Tsai (2007) shows that globalisation increases human welfare, measured by the Human Development Index. The results in Bjørnskov, Dreher and Fischer (2008) show, however, that self-reported life satisfaction is not robustly affected by globalisation. Globalisation does not threaten either social solidarity (Koster, 2007a) or the welfare state (Bergh, 2006). In contrast, Koster (2007b) shows that welfare state effort is not affected by social and political globalisation, while the level of generosity is negatively affected. Bjørnskov (2006) analyses the three dimensions of the KOF Index and shows that economic and social globalisation affect economic freedom, while political globalisation does not. According to Torgler (2008), globalisation increases trust in the United Nations. Table 4.1 provides an overview of studies that have utilised the KOF Index of Globalisation.

Table 4.1 Studies using the KOF Index of Globalisation

Study	Impact on ...	by economic globalisation	by political globalisation	by social globalisation	by overall globalisation
Ekman (2003)	Life expectancy				+
Sameti (2004)	Government size				+
Schmelzer (2005)	Transition into the labour market				+
Bergh (2006)	Welfare state				0

²⁸ The results obtained using the KOF Index are summarised on the web page of the KOF Swiss Economic Institute (<http://globalisation.kof.ethz.ch/papers/>).

Table 4.1 (continued)

Study	Impact on ...	by economic globalisation	by political globalisation	by social globalisation	by overall globalisation
Bjørnskov (2006)	Economic freedom		0		
	Government size	– (in rich countries)			–
	Legal quality			+ (in autocracies)	+
	Regulatory freedom	+ (in rich countries)		+	+
	Access to sound money			+ (in democracies)	+
Dreher (2006a)	Economic growth	+	0	+	+
Dreher (2006b)	Government spending	0	0	0	0
	Taxes on labour	0	0	0	0
	Taxes on consumption	0	0	0	0
	Taxes on capital ^a	+/-	0	+/-	+/-
Hattari and Ramkishen (2006)	Intra-Asian FDI flows	+	–	+	
Jamison, Jamison and Hanushek (2006)	Economic growth				+
Aidt and Gassebner (2007)	International trade	+ (economic restrictions)			
Bergh and Karlsson (2007)	Economic growth				0 (for rich countries)
Buch, DeLong and Neugebauer (2007)	Bank risk	–	– (for OECD countries)		
Choi (2007)	Military disputes	–	0	0	–
Dreher and Gaston (2007)	Union membership	0	0	–	–

Table 4.1 (continued)

Study	Impact on ...	by economic globalisation	by political globalisation	by social globalisation	by overall globalisation
Fischer (2007)	Social trust in business	+			
Gemmell, Kneller and Sanz (2007)	Share of government expenditures allocated to social security	–			
Gersbach, Schneider and Schneller (2007)	Basic research expenditures	0			0
Hajer (2007)	Government expenditure and revenue				0
Jacoby (2007)	EU Integration (catch up)	+	+	+	+
Koster (2007a)	Willingness to help the sick & disabled	0		0	
	Willingness to help immigrants	+		+	
Koster (2007b)	Welfare state effort		0 (for 18 OECD-countries)	0 (for 18 OECD-countries)	
	Level of generosity		– (for 18 OECD-countries)	– (for 18 OECD-countries)	
Law (2007)	Constitutional rights (human & property)				+
Lovely and Popp (2007)	Environmental regulations	0 (restrictions only)			
Miles and Posner (2007)	Treaty activity		+		
	Efficiency of government		0		
Potrafke (2007a)	Social expenditures	– (1980–2003; 1991–2003)	0	0	– (1980–2003; 1991–2003)
Potrafke (2007b)	Health expenditures	– (1970–2004; 1970–1990)	0	0	0
Potrafke (2007c)	Government expenditure shares	– (some categories)	– (some categories)	0	– (some categories)

Table 4.1 (continued)

Study	Impact on ...	by economic globalisation	by political globalisation	by social globalisation	by overall globalisation
Tavares (2007)	Democracy	0			
Tsai (2007)	Human welfare	+		+	+
	Government revenue (state power)	+	+	0	+
	Government social spending	0	+	+	+
Vandenbussche and Zanardi (2007)	Imports	+			
Vinig and Kluijver (2007)	Entrepreneurial activity				– (low income countries) 0 (overall sample) 0
Bjørnskov, Dreher and Fischer (2008)	Life satisfaction				
Dreher and Gaston (2008)	Income and earnings equality	0	0	0	– (for OECD countries) 0
Dreher, Sturm and Ursprung (2008)	Composition of government expenditure	0	0	0	0
Gassebner, Gaston and Lamla (2008)	Stringency of environmental standards				0
Torgler (2008)	Trust in international organisations	+	+	–	+

Notes: The table summarises the findings of previous studies using the KOF Index of Globalisation. “0” denotes no significant impact at the ten per cent level, “+” a significant increase in the variable of interest and “–” a significant decrease in the variable of interest.

^a Results depend on how taxes on capital are measured.

The abstracts of all studies are listed at: <http://globalization.kof.ethz.ch/papers/>.

The following section revisits some topics addressed by two of the authors using older versions of the KOF Index. Specifically, we use the most recent (2007) KOF Index of Globalisation and investigate the impact of globalisation on government spending and taxation (following Dreher, 2006b), expenditure composition (Dreher, Sturm and Ursprung, 2008), economic growth (Dreher, 2006a), unionisation (Dreher and Gaston, 2007) and inequality (Dreher and Gaston, 2008). For the first time, the impact of globalisation on the natural environment is also investigated. Ideally, we would want to check the robustness of our results by also employing the MGI. However, the MGI is only available for a cross-section of countries and can therefore not be used for panel data analyses. The same is true of the ATK/FP index (available for the years 2001–2006) and the WMRC (available only for 2001).

4.1 Government spending and taxation and the state of the Welfare State

Critics of globalisation claim that increasing economic integration is responsible for reduced social spending and a shift in the tax burden from capital to labour. Whether globalisation indeed influences tax policy or social expenditures has been analysed in numerous empirical studies. The results, however, are far from conclusive.²⁹ In previous studies, the influence of globalisation is measured by the extent of capital controls, trade openness or the amount of FDI. The possible influence of political integration is ignored. Increased political integration makes it more difficult for trans-national enterprises to circumvent national regulation. If rising economic integration is associated with more political integration, these effects could offset one another. The estimates of economic integration reported in previous studies would therefore be biased. Similar arguments can be applied to social integration. In the absence of capital restrictions, competition in taxes and expenditure are more likely, the closer the potential host country's culture is to that of the source country and the easier it is to exchange information. Therefore, the social dimension of globalisation may also be important for economic policy.

²⁹ According to Swank (2001) and Adserà and Boix (2002), globalisation increases the tax burden, while Rodrik (1997) and Vaubel (2000) show that globalisation is associated with decreased tax revenue. Garrett (1995) and Heinemann (2000) do not find any significant influence of globalisation on revenue. While Garrett (1995), Quinn (1997) and Swank (2001) show that globalisation leads to higher corporate taxes, Hansson and Olofsdotter (2003) report the opposite. The effects of globalisation on social spending are equally moot. Hicks and Swank (1992) and Vaubel (2000) report a significantly positive effect; while Swank (2001) and Garrett and Mitchell (1999) find a significantly negative one. Schulze and Ursprung (1999) and Dreher, Sturm and Ursprung (2008) summarise theoretical and empirical work on this topic.

From a policy perspective, the influences of individual elements of globalisation on economic policy are important. However, since most elements of globalisation are highly correlated, it is impossible to include them all individually in a single regression specification. On the other hand, omitting relevant dimensions biases the estimated coefficients. Using aggregate indicators of globalisation is therefore preferable.

In this section, the overall influence of globalisation as well as the individual effects of economic, political and social integration on the economic policies of OECD countries is econometrically examined. Specifically, whether and to what extent globalisation influences governments' social and overall spending, as well as implicit tax rates on labour, consumption and capital is investigated. In addition to the covariates that are commonly used in the literature, the regression analysis employs the KOF Index of Globalisation. Before turning to our empirical analysis, we briefly review the literature on globalisation and welfare states.

Literature Overview: The earlier literature on the globalisation-welfare state nexus mainly dealt with three issues, the first one being the structural tax-competition effect.³⁰ Economic reasoning suggests that the tax burden is shifted away from increasingly mobile factors, i.e., in particular capital, when a country becomes increasingly more integrated into the world economy.³¹ The second issue directly addresses the question whether globalisation has a positive or negative effect on welfare state activities as measured by the relative size of the government sector. The third avenue of investigation takes a more differentiated approach to measuring welfare state activities by focussing on the structure (rather than the level) of government spending, e.g., on specific categories such as social security and welfare expenditures.³²

After having surveyed the early literature, Schulze and Ursprung (1999, pp. 345–347) conclude that: “*The general picture drawn by the few econometric studies available thus far does not lend any support to any alarmist view. At an aggregate level, many of these studies find no negative relationship between globalisation and the nation states' ability to conduct independent fiscal policies. ... Viewing the income and expenditure side of government budgets separately, ... the tax structure may have been influenced by the globalisation process ... [g]iven the small corporate income tax base and the fact that no shift of the tax burden from capital to labour has taken place, it is not surprising that, on the expenditure side, no strong evidence points to a significant globalisation-induced change of the level of public spending. ... This may be due, however, to a lack of studies using strongly disaggregated public expenditure data*”.

³⁰ For a survey, see Schulze and Ursprung (1999).

³¹ Notable contributions are Garrett (1995), Quinn (1997), Rodrik (1997) and Swank (1997).

³² Research on the latter two lines of inquiry are Hicks and Swank (1992), Huber, Ragin and Stephens (1993), Garrett (1995), Cusack (1997), Quinn (1997), Swank (1997), Garrett and Mitchell (1997), Garrett (1998b, 1998c), Rodrik (1998a), Gaston and Nelson (2004) and Gaston and Rajaguru (2008).

Many contributions to the more recent globalisation literature have taken up this challenge by using disaggregated data in order to focus on specific welfare state programs; others have focussed on specific groups of countries or have refined the empirical methods. We briefly comment on some of these studies on each of these strands of research.

In a reconsideration of their earlier unpublished study of 1997, Garrett and Mitchell (2001) arrive at conclusions that contradict the received wisdom summarised above. Their panel data analysis purports to show that increases in trade are associated with less total government spending. In particular, they find lower security benefits as a share of GDP, which would imply that the “disciplining effect” more than offsets the “compensation effect”. A comparison of these effects permeates much of the literature on this topic.

The “disciplining hypothesis” states that international competition restricts the scope for government spending.³³ That is, in order to maintain the tax base, governments competitively lower tax rates on capital (i.e., a “race to the bottom”). Since revenues decline, the State’s capacity to redistribute is lowered and government expenditures must decline as well. Alternatively, social spending could rise with globalisation if governments expand the welfare state in order to insure their citizens against the risks of globalisation. This is the so-called “compensation hypothesis”.

Kittel and Winner (2005) and Plümper, Manow and Tröger (2005) show that the results obtained by Garrett and Mitchell (2001) cannot be replicated if the econometric model is properly specified. These latter studies conclude that government spending is primarily driven by the state of the domestic economy and are thus independent of international economic openness, implying not only the absence of significant disciplining effects but also the absence of compensatory measures. This result is in line with the study by Iversen and Cusack (2000) who do not find any relationship between globalisation and labour market employment and wage risks, whereas uncertainty and dislocation caused by deindustrialisation appear to have spurred electoral demands for welfare state compensation and greater risk sharing.

Overall, the demand for welfare state activities appears to be mainly driven by domestic considerations and not by the labour market risks associated with international trade. Dreher and Gaston (2007) find that globalisation gave rise to de-unionisation. However, in delving further into the issue, they find that it is social integration, rather than economic integration, that has been the main contributor to the decline in union membership. Bretschger and Hettich (2002) use an ingenious and novel measure of openness that corrects for country size and find that globalisation has a negative and significant impact on corporate income taxes and tends to raise labour taxes. On the other hand, they also find that globalisation increases social expenditures. As a consequence, the disciplining effect impacts on the tax mix, whereas compensation is provided through increased social expenditures.

³³ See, for example, Brennan and Buchanan (1980).

Studies focussing on specific groups of countries usually examine the impact of global economic integration on developing countries. Rudra (2002), for example, observes that defending welfare benefits under the pressure of globalisation is much easier in OECD countries than in LDCs. This result points to the crucial role of the political regime in accommodating the demand side of the political market. In their analysis of Latin American countries, Kaufman and Segura-Ubiergo (2001) and Avelino, Brown and Hunter (2005) control for the influence of the political regime. The empirical evidence uncovered by Kaufman and Segura-Ubiergo favours the disciplining hypothesis. On the other hand, their results also suggest that democracies may be more responsive to compensation demands than other regimes, at least when it comes to social spending on health and education. Avelino, Brown and Hunter (2005) confirm that education is positively associated with openness (as do Rudra, 2004 and Ansell, 2004), but obtain a more robust impact of democratic regimes and their estimates are generally supportive of the compensation hypothesis. Their overall results are consistent with those obtained by Adserà and Boix (2002) who used a more complete sample of countries.

Apart from responding to globalisation pressures in different ways, political regimes may also be linked to globalisation in a causal relationship. On the one hand, Richards, Gelleny and Sacko (2001) discover systematic evidence that both FDI and portfolio investment are associated with increased government respect for human rights. This finding is corroborated by Rudra (2005) who finds that globalisation generally strengthens democracy in the developing world if social safety nets are used to provide stability and to build political support. On the other hand, a number of studies show that civil and political freedom attract FDI (see, for example, Harms and Ursprung, 2002; Bengoa and Sanches-Robles, 2003 and Busse, 2004), thus giving rise to a virtuous globalisation-democratisation cycle.

Potential Influences of Globalisation on Economic Policy: There are many ways to restrict international political competition. While national restrictions on international transactions have been sharply reduced since the 1980s, agreements among governments – in the form of harmonised taxes or joint standards – have become more common.³⁴ These developments did not take place in a vacuum. Vaubel (2000, p. 283) contends that trade liberalisation increases factor productivity and income. In the short run, with tax rates constant, liberalisation raises total tax revenue, even though tariff revenues fall. The increased tax revenue gives politicians a reason to favour trade liberalisation. Similarly, liberalisation of the capital account is efficiency-enhancing.³⁵ With more foreign suppliers and investors, resistance to barriers to market entry increases and such regulations decline (Peltzman, 1989; Vaubel, 2000). At the same time, economic integration increases political competition among governments, which reduces government revenue.

³⁴ In the late 1990s there were initiatives to prevent “harmful” tax competition in the EU as well as in the OECD (Devereux, Lockwood and Redoano, 2002). See also European Commission (1998), OECD (1998) and van der Hoek (2003).

³⁵ Tax revenue can decline in capital exporting countries, however.

The more political competition increases, the more governments are conducive to political integration and policy coordination (Vaubel, 1990). The dismantling of economic restrictions therefore leads to more cooperation in politics.

The empirical relationship between economic integration and economic policy has been previously analysed.³⁶ The usual line of reasoning is that economic integration induces mobile factors of production to migrate to the country with the lowest taxes. The disciplining hypothesis is contentious, however. Apolte (2001) shows that Leviathan governments may not be effectively restricted by economic integration. Baldwin and Krugman (2000) show that reduced transport costs can increase the benefits of agglomeration. Linkages between producers and between producers and consumers lead to the agglomeration of production. As long as the benefits from agglomeration exceed the costs imposed by taxation, globalisation increases governments' abilities to tax mobile factors. Economic integration can therefore lead to higher tax rates on capital.³⁷

In the absence of sufficiently strong agglomeration forces, a government may seek to develop new sources of revenue as an alternative to reducing expenditure in the face of international competition. Immobile tax bases facilitate this objective. One would therefore expect taxes on labour and consumption to rise with economic globalisation. Governments could, however, also react to the increased competition by politically integrating. They might prevent competition, for example, through (unofficial) agreements. In addition, policy-makers could settle on a minimum tax rate, as has been done, for example, in the EU with value-added tax (VAT) rates.³⁸

If economic integration does foster political integration, those two dimensions of globalisation are likely to be highly correlated. If political integration is not accounted for, the estimated effect of globalisation will represent the joint effect of both dimensions. Since the effects of the two dimensions might operate in opposite directions, this could result in insignificant coefficient estimates. If the political effect exceeds the economic effect, this could also explain the results showing a positive impact of globalisation on corporate taxes. A country's degree of political integration with the rest of the world therefore has to be included in an analysis of economic integration. The same is true for technical and cultural aspects, which are also likely to be highly correlated with economic integration. If the coefficients estimated in previous studies primarily reflect technological change or increasing cultural proximity rather than measuring the "true" influence of economic integration, interpretations derived from those studies will be misleading.

³⁶ For reviews of theoretical models on tax competition in the EU, see Krogstrup (2002), Schulze and Ursprung (1999) and Wilson and Wildasin (2004).

³⁷ See also Kind et al. (2000) and Ludema and Wooton (2000). See Wilson and Wildasin (2004) for a detailed discussion.

³⁸ As another example, European Commissioner Monti (1998) favours tax coordination, because he argues, labour would otherwise be penalised for being less mobile than capital.

These considerations lead to the following hypotheses. Economic integration increases tax competition. However, tax rates on capital only decrease if agglomeration forces do not offset the pressure on taxes. Without significant agglomeration, tax rates on labour and consumption are expected to rise as a consequence of economic integration. When the effects of agglomeration dominate, tax rates on consumption and labour are not expected to rise (and may even decline).

Total government expenditures are expected to decrease as a consequence of economic integration (when political competition restricts governments' political leeway). Again, however, the presence of significant agglomeration forces may allow for higher expenditures. The same can be true for social spending.

Political integration, on the other hand, can be used to restrict competition. Such integration is therefore likely to increase tax rates, since it is no longer possible to compare circumstances in different countries and exit strategies become less feasible. Reduced competition can also lead to higher government total spending and social spending.

In terms of social integration, the likely influences are less clear. Higher cultural integration facilitates migration, differences in tax burdens or expenditures can more easily lead to population movements. The resulting increased competition should be reflected in lower tax rates (and lower expenditures). On the other hand, cultural integration can make a country more attractive to foreign investment, which could facilitate increased taxes and government spending.

Empirical Analysis: In order to test whether globalisation affects the economic policies of OECD countries, combined cross-section time-series regressions are estimated. The dependent variables are total and social spending relative to GDP and average effective tax rates on labour, consumption and capital. Most previous empirical studies use tax revenue as a proxy for the degree of tax competition (e.g., Garrett, 1995; Quinn, 1997; Swank, 2001). However, if tax rates are decreasing, an improved economic environment could increase revenues. In turn, this might conceal tax competition (Schulze and Ursprung, 1999, p. 316). Simply taking statutory tax rates would not substantially improve the analysis because the tax burden also depends on the tax base. Since there are substantial differences in tax-exempt thresholds, depreciation rules and other tax benefits across countries, tax bases would be different even with similar gross incomes. To account for this, recent studies employ average effective tax rates (e.g., Bretschger and Hettich, 2002; Hansson and Olofsdotter, 2003). Using the method suggested by Mendoza, Razin and Tesar (1994), actual tax revenue is expressed in reference to the tax base, which implicitly accounts for the effects of different tax benefits.³⁹ Therefore, average effective tax rates are used here. The robustness of the results is tested by using marginal and average effective tax rates based on an analysis of the legislation underlying different tax regimes (referred to as "adjusted statutory rates").

³⁹ For comprehensive discussions on tax ratios, see Volkerink and de Haan (2001), Volkerink, Sturm and de Haan (2002) and de Haan, Sturm and Volkerink (2003).

The average effective tax rates are calculated in Carey and Rabesona (2002) and are similar to the original Mendoza, Razin and Tesar (1994) data. All data are averages over five years and cover the period 1970–2000. Since some of the data are not available for all OECD countries or for all periods, the panel is unbalanced and the number of observations depends on the choice of explanatory variables. Significant fixed country and period effects were present in all specifications. (However, the coefficients of the country and time effects are not reported in the tables.) All standard errors are estimated robustly, i.e., the standard errors are heteroscedasticity-consistent. All variables, their precise definitions and data sources, are listed in the Appendix.

For each policy variable the system of equations to be estimated is

$$y_{it} = \alpha + \beta y_{it-1} + \gamma' G_{it} + \eta' X_{it} + \eta_i + \eta_t + \varepsilon_{it} \quad (4.1)$$

where y indicates the different policy measures, G represents the KOF globalisation indices, X is a vector of control variables, η_i is a country fixed effect and η_t is a period fixed effect.

Table 4.2 Globalisation and economic policy (1970–2004, OLS, static model)

	(1)	(2)	(3)	(4)	(5)	(6)
	Government consump- tion (percentage of GDP)		Government spending, social		Taxes on labour	
KOF Index of Globalisation	0.111 (3.16)***	0.088 (1.67)	-0.117 (1.09)	0.028 (0.28)	0.144 (1.68)*	0.365 (2.75)**
Age dependency ratio		-6.878 (1.01)		-0.295 (0.02)		21.776 (1.29)
Unemployment		0.244 (3.88)***		0.328 (2.73)**		0.209 (1.37)
Government employment		0.274 (1.75)*		-0.114 (0.39)		-0.139 (0.39)
Government left- wing		0.095 (0.31)		-0.432 (0.79)		0.395 (0.67)
GDP p.c. growth		-0.355 (3.98)***		-0.534 (3.29)***		-0.272 (1.19)
Costs of trade		12.333 (2.09)**		-5.332 (0.48)		-4.274 (0.17)
Number of countries	30	24	28	22	23	20
Number of observations	168	67	75	58	98	53
Normality (prob>chi ²) ^a	0.00	0.00	0.04	0.10	0.62	0.05
R ²	0.40	0.39	0.43	0.01	0.35	0.28

Table 4.2 (continued)

	(7)	(8)	(9)	(10)
	Taxes on consumption		Taxes on capital	
KOF Index of Globalisation	-0.032 (0.71)	0.010 (0.16)	0.131 (0.89)	0.167 (0.63)
Age dependency ratio		10.943 (1.37)		36.838 (0.66)
Unemployment		-0.141 (1.87)*		-0.369 (1.13)
Government employment		0.336 (1.82)*		0.637 (0.96)
Government left-wing		-0.247 (0.74)		-0.525 (0.42)
GDP p.c. growth		-0.075 (0.77)		0.072 (0.16)
Costs of trade		4.240 (0.59)		-23.149 (0.36)
Number of countries	25	21	24	19
Number of observations	116	62	96	48
Normality (prob>chi ²) ^a	0.64	0.08	0.96	0.68
R ²	0.03	0.21	0.25	0.36

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

^a Skewness/kurtosis test for normality of residuals. The null hypothesis is that there is no difference in the cumulative distribution of the residuals compared to the theoretical normal distribution.

Table 4.2 reports the results when β in equation (4.1) is restricted to zero.⁴⁰ The same explanatory variables are employed to explain each policy variable. The first column explains the relationship of the different dependent variables and the overall Index of Globalisation. The second column adds variables that have been shown to be significant in previous studies: the share of under-15 year-old and over-64 year-old people relative to population (the dependency ratio), the unemployment rate, the number of government employees as a proportion of the working age population, a dummy variable for left-wing governments, economic growth and a proxy for the costs of international trade (Vaubel, 2000; Razin, Sadka and Swagel, 2002; Hansson and Olofsdotter, 2003).

The dependency ratio controls for demographic factors. With a higher dependency ratio, taxes and expenditures are expected to be higher. Regarding expenditures and taxes on capital and consumption, the same is true for unemployment. However, for taxes on labour a negative coefficient is expected. Government employment indicates the extent of government involvement in the economy and is expected to increase taxes and expenditures. Left-wing governments are more likely to tax capital and usually have a higher preference for larger welfare state spending than centrist or right-wing governments. Expenditures and taxes are expected to be higher when left-wing governments hold office. This is especially true for taxes on capital.

In the tax competition literature, economic growth is expected to reduce tax rates on capital, while expenditures are likely to increase during times of economic prosperity (e.g., Hansson and Olofsdotter, 2003). With respect to consumption and labour tax rates, the impact of growth could be in either direction. Reductions in the costs of international trade increase the importance of agglomeration forces and are thus expected to lead to higher tax rates (and expenditures). This is due to the decrease in factor mobility.⁴¹

As can be seen in Table 4.2 and in line with a priori expectations, higher unemployment leads to significantly higher government total and social expenditures; tax rates on consumption are reduced. The results also show that a larger public sector, as measured by government employees relative to total employees, increases total government expenses, with a coefficient significant at the ten per cent level. Also at the ten per cent level, taxes on consumption rise significantly with larger government employment. Higher economic growth reduces overall and social expenditure but has no effect on taxes. The impact of growth on social and total spending may be due to reverse causality. In fact, the coefficient is significantly positive if the lagged value of growth is included in the regressions instead of the contemporaneous value.⁴²

⁴⁰ Since there is evidence of significant first-order autocorrelation in all models, the disturbance term is modelled as an AR(1) process.

⁴¹ See Hansson and Olofsdotter (2003) for a detailed discussion.

⁴² This issue is discussed in more detail below.

Following Hansson and Olofsdotter (2003), the costs of international trade are proxied by imports including costs for insurance and freight relative to imports free-on-board. As can be seen, government consumption rises with higher costs of trade, at the five per cent level of significance, but is insignificant in the other regressions. Arguably, the insignificance of the proxy for costs of trade in the other four specifications could result from the presence of the Index of Globalisation in the regressions. As discussed, the Index of Globalisation partly controls for the reduced transaction costs that encourage agglomeration. When the Index of Globalisation is excluded from the regressions, however, the coefficient remains insignificant.

While in the full model globalisation does not significantly influence government spending, taxes on capital and consumption, the results show that taxes on labour significantly increase with globalisation. This is in line with the hypothesis that taxes are shifted to the immobile factor.

The governments' political persuasion and the dependency ratio are insignificant in all regressions. For the full models, the regressions explain between 0.01 (government social spending) and 0.39 (government total spending) per cent of the variance of the dependent variable. Table 4.2 also shows that the normality of the residuals can not be rejected (at the ten per cent level of significance) in most cases.

Table 4.3 Globalisation and economic policy (1970–2004, dynamic model)

	(1) Government consumption (percentage of GDP)	(2)	(3) Government spending, social	(4)	(5) Taxes on labour	(6)
KOF Index of Globalisation	0.121 (1.98)*	0.101 (0.87)	0.055 (0.52)	-0.027 (0.12)	0.121 (1.10)	0.279 (0.93)
Age dependency ratio	-2.522 (0.52)	-8.426 (0.72)	-15.039 (1.50)	-14.466 (0.92)	16.577 (1.64)	26.212 (0.44)
Unemployment	0.173 (2.47)**	0.196 (2.90)***	0.273 (2.05)**	0.442 (2.79)**	0.001 (0.01)	0.045 (0.12)
Government employment	0.599 (3.76)***	0.536 (3.59)***	-0.166 (0.73)	-0.162 (0.46)	0.077 (0.30)	-0.333 (0.42)
Government left- wing	0.230 (0.63)	0.029 (0.03)	-0.040 (0.07)	0.293 (0.41)	-0.831 (1.14)	0.918 (0.85)
GDP p.c. growth	-0.283 (2.79)***	-0.232 (2.36)**	-0.784 (4.63)***	-0.742 (6.05)***	-0.344 (1.74)*	-0.481 (1.02)
Costs of trade	2.159 (0.56)	6.669 (0.66)	0.074 (0.01)	4.269 (0.65)	30.214 (1.60)	68.508 (0.96)
Lagged depend- ent variable	0.095 (0.64)	0.024 (0.11)	0.196 (1.13)	-0.071 (0.14)	0.638 (4.50)***	0.337 (0.79)
Estimation method	OLS	GMM	OLS	GMM	OLS	GMM
Number of countries	28	24	25	21	22	17
Number of observations	95	67	65	40	70	48
Normality (prob>chi ²) ^a	0.01		0.7		0.00	
R ²	0.62		0.79		0.78	
Sargan test (p-level)		0.99		0.33		0.99
Arellano-Bond test (p-level)		0.87		n.a.		0.69

Table 4.3 (continued)

	(7)	(8)	(9)	(10)
	Taxes on consumption		Taxes on capital	
KOF Index of Globalisation	0.035 (0.55)	0.094 (0.65)	0.287 (1.26)	0.200 (0.53)
Age dependency ratio	-6.699 (1.16)	7.701 (0.45)	-11.286 (0.40)	40.840 (1.41)
Unemployment	0.028 (0.38)	0.008 (0.07)	0.021 (0.07)	-0.155 (0.47)
Government employment	0.251 (1.71)*	0.415 (1.70)	0.384 (0.77)	-0.327 (1.18)
Government left-wing	0.285 (0.70)	-0.022 (0.04)	-1.188 (0.80)	-1.829 (0.54)
GDP p.c. growth	-0.019 (0.17)	-0.002 (0.01)	-0.037 (0.08)	0.136 (0.33)
Costs of trade	-1.474 (0.35)	-3.126 (0.35)	-7.195 (0.19)	-6.691 (0.26)
Lagged dependent variable	0.361 (3.25)***	-0.081 (0.31)	0.197 (1.08)	0.804 (3.03)***
Estimation method	OLS	GMM	OLS	GMM
Number of countries	24	21	22	22
Number of observations	86	62	65	65
Normality (prob>chi ²) ^a	0.06		0.66	
R ²	0.46		0.39	
Sargan test (p-level)		0.86		0.99
Arellano-Bond test (p-level)		0.78		0.41

Absolute value of t statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

^a Skewness/kurtosis test for normality of residuals. The null hypothesis is that there is no difference in the cumulative distribution of the residuals compared to the theoretical normal distribution.

Table 4.3 replicates the analysis for the dynamic model of equation (4.1), including the lagged dependent variable. The lagged dependent variable is included, because government spending and taxes change only slowly over time rather than being changed instantaneously. These changes could impose adjustment costs on the private sector or might be politically blocked by interest groups (Devereux, Lockwood and Redoano, 2002). However, in the presence of fixed country effects, the ordinary least squares (OLS) estimator is inconsistent. To deal with this, the generalised method of moments (GMM) system estimator suggested by Arellano and Bover (1995) and Blundell and Bond (1998) is used. The results, employing the two-step estimator implemented by Roodman (2006) in the Stata software package, including Windmeijer's (2005) finite sample correction are presented. The lagged dependent variable is treated as endogenous, the Index of Globalisation as predetermined and the additional covariates as strictly exogenous. As before, time dummies are included in the regression. The results of the Sargan test on the validity of the instruments used (amounting to a test for the exogeneity of the covariates) and the Arellano-Bond test of second order autocorrelation are reported.⁴³

Table 4.3 indicates that inclusion of the lagged dependent variable in the OLS regressions does change the results. Unfortunately, applying the GMM estimator leads to a dramatic loss of observations, since information from two periods is discarded by differencing and instrumenting. Again, most covariates are insignificant. Note that the Arellano-Bond test of second-order autocorrelation and the Sargan test fail to reject the specification at conventional levels of significance. The lagged dependent variable is significant in only three of the ten regressions reported in Table 4.3.

Most importantly, the Index of Globalisation no longer significantly affects taxes on labour when the lagged dependent variable is included. In addition, the residuals are not always normally distributed. The results remain, however, if the influence of outliers is taken into account (not reported in the Table 4.3). This leads us to conclude that the globalisation of the last thirty years has not had a major influence on tax rates and expenditure policies in OECD countries.

⁴³ Second-order autocorrelation must be absent in order for the estimator to be consistent.

Table 4.4 Dimensions of globalisation and economic policy (1970–2004, dynamic model)

	(1)	(2)	(3)	(4)	(5)	(6)
	Government consumption (per- centage of GDP)		Government spending, social		Taxes on labour	
Index of economic globalisation	−0.016 (0.40)	−0.022 (0.18)	−0.030 (0.39)	0.028 (0.30)	0.121 (1.43)	−0.119 (0.77)
Index of social globalisation	0.051 (1.62)	0.045 (0.58)	0.041 (0.70)	0.008 (0.09)	0.014 (0.21)	0.056 (1.30)
Index of political globalisation	0.057 (2.04)**	0.020 (0.36)	0.007 (0.11)	−0.062 (0.51)	−0.018 (0.31)	−0.002 (0.02)
Age dependency ratio	−2.714 (0.56)	−3.527 (0.43)	−16.085 (1.55)	−17.187 (0.83)	15.018 (1.42)	11.214 (0.36)
Unemployment	0.202 (2.81)***	0.206 (1.95)*	0.291 (2.07)**	0.295 (1.47)	−0.029 (0.18)	0.031 (0.12)
Government employment	0.555 (3.47)***	0.352 (1.04)	−0.169 (0.70)	0.188 (0.17)	0.093 (0.36)	0.085 (0.34)
Government left-wing	0.089 (0.24)	0.161 (0.20)	−0.087 (0.15)	0.202 (0.17)	−0.661 (0.87)	1.287 (0.75)
GDP p.c. growth	−0.324 (3.13)***	−0.177 (0.54)	−0.777 (4.47)***	−0.627 (2.30)**	−0.308 (1.52)	−0.438 (0.92)
Costs of trade	3.872 (0.98)	−0.428 (0.03)	1.572 (0.17)	−14.899 (0.61)	35.676 (1.79)*	6.152 (0.36)
Lagged dependent variable	0.115 (0.77)	0.320 (0.80)	0.194 (1.08)	0.019 (0.03)	0.613 (4.22)***	0.803 (3.93)***
Estimation method	OLS	GMM	OLS	GMM	OLS	GMM
Number of countries	28	24	25	21	22	22
Number of observations	95	67	65	40	70	70
Normality (prob>chi ²) ^a	0.01		0.83		0.00	
R ²	0.64		0.79		0.79	
Sargan test (p-level)		0.99		0.99		0.99
Arellano-Bond test (p-level)		0.41		n.a.		0.81

Table 4.4 (continued)

	(7)	(8)	(9)	(10)
	Taxes on consumption		Taxes on capital	
Index of economic globalisation	-0.020 (0.44)	-0.135 (0.93)	0.427 (2.58)**	3.948 (1.58)
Index of social globalisation	0.027 (0.81)	-0.009 (0.12)	-0.136 (1.07)	0.448 (1.17)
Index of political globalisation	0.011 (0.35)	0.051 (0.91)	0.041 (0.31)	-0.818 (1.48)
Age dependency ratio	-6.926 (1.17)	-7.524 (0.52)	-3.773 (0.12)	-265.326 (1.19)
Unemployment	0.045 (0.59)	0.167 (1.24)	-0.250 (0.81)	5.176 (1.42)
Government employment	0.241 (1.61)	0.520 (0.91)	0.371 (0.79)	-5.363 (0.98)
Government left-wing	0.254 (0.60)	-0.072 (0.07)	-1.292 (0.91)	-32.324 (1.50)
GDP p.c. growth	-0.030 (0.26)	-0.012 (0.07)	-0.007 (0.02)	8.599 (1.58)
Costs of trade	-0.394 (0.09)	2.996 (0.28)	23.367 (0.61)	-644.769 (1.40)
Lagged dependent variable	0.358 (3.18)***	0.217 (0.49)	0.204 (1.14)	-4.358 (1.43)
Estimation method	OLS	GMM	OLS	GMM
Number of countries	24	21	22	15
Number of observations	86	62	65	43
Normality (prob>chi ²) ^a	0.07		0.99	
R ²	0.47		0.49	
Sargan test (p-level)		0.99		0.99
Arellano-Bond test (p-level)		0.28		0.65

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

^a Skewness/kurtosis test for normality of residuals. The null hypothesis is that there is no difference in the cumulative distribution of the residuals compared to the theoretical normal distribution.

In what follows, the overall Index of Globalisation is replaced by the three sub-indices in the regression specifications. Again, notice that the small sample size makes the GMM estimates suggestive rather than definitive. Table 4.4 reports the results. The disaggregated analysis confirms the previous estimates. In almost all cases, the coefficients of the globalisation variables are completely insignificant. The tax rate on capital in the OLS regression is the only exception. The results show that economic integration increases capital taxes, with a coefficient significant at the five per cent level. This result supports previous research.⁴⁴ Note, however, that the coefficient of capital taxes becomes marginally insignificant in the GMM regression, once again, likely due to the small sample size.

There are several possible explanations for the positive correlation between capital taxes and globalisation. First, as hypothesised, the positive influence of economic integration on capital taxes can be due to agglomeration effects (with the Index of Globalisation being a better proxy for the costs of trade than the proxy based on imports). Secondly, the result supports the political economy literature that argues that globalisation moves the median voter to the left. This is not contradicted by the insignificance of the dummy for left-wing governments in most regressions, since it may be that all parties moved to the left, which would not be reflected by the coefficient on the dummy. Thirdly, the globalisation index could be correlated with a general upward trend in overall tax revenues. The index would then capture the overall trend in tax revenues instead of capturing the effect of globalisation.⁴⁵ Finally, the result may be due to omitted variable bias. However, inclusion of additional covariates, such as a country's per capita GDP, does not change the result.

Summary: Globalisation has been criticised as being responsible for shifting the tax burden from mobile capital onto immobile labour. Critics also claim that although the OECD countries' actual spending did increase over the last thirty years, spending (and taxes on capital) would have been higher without globalisation because the economic environment deteriorated since the 1970s. In sharp contrast to such arguments, the results of the empirical analysis in this section indicate that globalisation has not robustly affected spending and tax rates. If at all, taxes on capital increase as a consequence of economic globalisation. In other words, globalisation has *not* lead to a race-to-the-bottom in fiscal policy.

⁴⁴ Using the 2002 version of the KOF Index, Dreher (2006b) confirms the positive effect of globalisation on capital taxes. Quinn (1997) and Rodrik (1997) find that the capital tax burden is positively related to integration. Devereux, Lockwood and Redoano (2002) show that a country's openness increases average tax rates on several classes of investment. Krogstrup (2003) reports that capital taxes increase significantly with capital account liberalisation (as measured by Quinn's 14-point index). The results run counter to those of Genschel (2002), who argues that the increasing tax competition due to globalisation substantially decreases governments' leeway for independent policy. Although Genschel concedes that taxes on capital did not on average decrease, he claims that they would nevertheless be higher without integration, since the economic environment deteriorated. The analysis clearly refutes this conjecture since it controls for the economic environment.

⁴⁵ As in Krogstrup (2003), however, adding overall tax revenues (as a share of GDP) to the regression does not change the result.

4.2 The composition of government spending

Even if levels of government spending are unaffected by globalisation, the composition of spending might still be affected. Therefore, any thorough investigation of the impact of globalisation on expenditures also has to focus upon shifts in the relevant expenditure shares.⁴⁶ This section deals with this link between globalisation and expenditure shares.

We estimate the impact of globalisation on individual policy dimensions, acknowledging that all policy measures are to some extent substitutes or complements for each other. That is, the indirect globalisation effects, which work through changes in related welfare-state activities, may play an important role. Mutual interdependence is clearly an issue if one focusses, as we do, on disaggregated government spending since all categories of government spending are connected via the overall budget policy. Applying our research strategy, we may uncover globalisation effects that would remain otherwise obscured.

Our empirical strategy is to estimate whole systems of equations in order to reveal whether the relative importance of specific expenditure categories is influenced by globalisation. According to the compensation hypothesis, some categories may become more important even if the overall level of government expenditures remains unchanged. This applies to social expenditures, in particular. The disciplining effect of globalisation, on the other hand, will have a detrimental effect on all kinds of welfare state expenditures.

Data and Method: In order to test whether globalisation affects the composition of government expenditures, we follow Dreher, Sturm and Ursprung (2008) and estimate combined cross-section time-series regressions with yearly data. The data are from the World Bank's (2003) World Development Indicators. These data are for up to 108 countries and cover the period 1970–2001. Data are classified according to four broad expenditure categories: capital expenditures, expenditures for goods and services, interest payments and subsidies and other current transfers. These data are available as shares of total expenditures. However, they cover central government expenditures only.

Figure 4.1 shows the development of the average expenditure shares over time for the largest sample possible. The most prominent feature of the graph is the increase in interest payments over time (from 5 per cent to 11.5 per cent). The share of subsidies increased from 28.5 per cent to 32.5 per cent over the sample period, while the share of expenditures on goods decreased from 46.1 per cent to 40.3 per cent and the share of capital expenditures from 20.4 per cent to 15.7 per cent. That is, there is no obvious erosion in subsidies over time.

⁴⁶ This is precisely what Dreher, Sturm and Ursprung (2008) do, using a previous version of the KOF index.

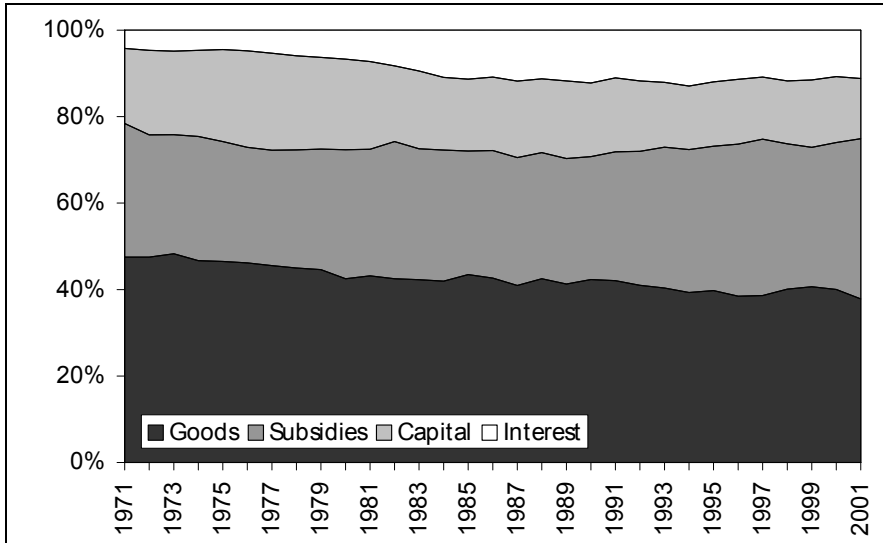


Figure 4.1 Development of average expenditure shares

The dependent variables are the respective expenditure categories as a (percentage) share of total expenditures. Since some of the data are not available for all countries or for all years, the panel is unbalanced and the number of observations depends on the choice of explanatory variables. For ease of comparison, we keep the sample fixed (to those countries and years for which all variables are available). Further, the sample is chosen such that only those observations for which these four or ten categories do sum up to total government expenditures (i.e., 100 per cent) are included. This results in a world sample of 614 observations containing 60 countries for the period 1971–2001. When we restrict the sample to OECD countries, there are 255 observations for 18 countries. In both cases, most observations are from the 1980s and 1990s. Again all variables, their precise definitions and data sources are listed in the Appendix.

One potential problem with the World Bank data is that they exclude expenditures at lower tiers of government, which might blur the results. Even if the composition of central government expenditures does not change, expenditure provided by the lower tiers might change. However, Garrett and Rodden (2000) show that globalisation increases centralisation. With increasing globalisation, the data thus cover a larger share of overall expenditures. If this increase is not evenly distributed across the spending categories, our analysis, which uses central government data, is more likely to find an effect compared to an analysis based on total government spending. Moreover, globalisation is arguably more likely to affect the central government than its lower-tier jurisdictions. In many countries, horizontal competition between jurisdictions has generally been strong. This competi-

tion is likely to dominate external pressure, while central governments have to some extent been sheltered from competition before the most recent onset of globalisation. Finally, our analysis includes fixed country effects and thus controls for the federal structure of the countries in the sample. Overall, we therefore conclude that data limitations when using the World Bank data do not pose major problems.

In addition to being affected by globalisation, the expenditure composition in a particular country might also depend directly on the composition of expenditures in other countries. A country's policy reaction function can be written as

$$y_{i,t} = R_i(y_{-i,t-1}, X_{i,t}), \quad (4.2)$$

with y_{it} being the respective expenditure category, $y_{-i,t-1}$ the vector of expenditure shares in all other countries at time $t-1$ and X_{it} the vector of control variables.

Clearly, this equation cannot be estimated given the available degrees of freedom. Following the earlier literature, Devereux, Lockwood and Redoano (2002) suggest replacing the $y_{-i,t-1}$ vector with the weighted average. Since countries are more likely to respond to countries in their immediate neighbourhood, we use the inverse of the distance between the capital cities of the countries to arrive at the weights ω_{ij} .

The system of equations to be estimated is

$$y_{it}^n = \alpha_i^n + \beta_i^n y_{it-1}^n + \gamma_i^n G_{it} + \delta_i^n A_{it-1}^n + \eta_i^n X_{it} + \varepsilon_{it}^n, \quad (4.3)$$

where G represents the measure of globalisation, α_i is a country fixed effect, ε_{it} is an error term, n ranges from 1 to 4, i represents the country and t the time period.

The lagged dependent variable is included because the composition of government expenditures changes slowly over time. It can be interpreted as a speed-of-adjustment parameter. Reasons for this inertia may be costs of adjustment in the private sector or constraints imposed by interest groups (Devereux, Lockwood and Redoano, 2002, p. 4). Consequently, the estimated coefficients of the remaining explanatory variables need to be interpreted as reflecting the initial impact on the respective expenditure share. The long-run effect is given by the same coefficient divided by $(1 - \beta_i^n)$.

We do not include fixed period effects, since they are already present in the weighted average and the lagged dependent variable.⁴⁷ Note that the weighted average variable enters the regressions with a lag. From a theoretical perspective this is preferable, since it takes time for a country to respond to changes in other coun-

⁴⁷ See Devereux, Lockwood and Redoano (2002) for details.

tries' policies. Econometrically, this allows estimation without instrumenting the potentially endogenous contemporaneous average policy variables.

A general problem in empirical research when there is no accepted theoretical model is the appropriate choice of covariates, i.e., variables entering the X -vector. We opt for a list of seven variables: real economic growth, the age-dependency ratio, government expenditures, government debt, the lending rate charged by banks on loans to prime customers and the inflation rate. The growth rate of real GDP accounts for the business cycle. Arguably, one may expect subsidies to rise in recessions, while public investments are likely to be reduced. According to Aubin et al. (1988), public capital spending is likely to decrease when inflation accelerates and to increase with increasing unemployment. As Dreher (2006b) shows, social spending is significantly lower in periods of low growth.

The second variable included in the basic regressions is the share of under-15 year-olds and the over-64 year-olds relative to the total population (referred to as the "age-dependency ratio"). This ratio controls for demographic factors and is expected to vary positively with subsidies and negatively with capital outlays. The third variable is the total amount of public expenditures (as a percentage of GDP) since there is good reason to believe that the composition of government expenditures also depends on its level. In countries with smaller state sectors we expect social expenditures to be relatively low, while government consumption is likely to be higher than in countries with large state sectors. Government debt and the lending rate are included because they directly affect the expenditure of governments. Finally, the rate of inflation has been shown to affect government expenditure in previous work (e.g., Lin, 1992).

Since the individual expenditure categories are not independent of each other (they sum to 100 per cent of total expenditures) and the inclusion of the lagged dependent variables implies that each equation has a different set of regressors, we estimate the equations using Seemingly Unrelated Regressions (SUR). The SUR model permits non-zero covariances between the error terms of the expenditure share equations, allowing for an improvement in efficiency, relative to the classical OLS estimator.

There are additional methodological problems. Given the inclusion of the lagged dependent variable and fixed country effects, the OLS estimator is biased and inconsistent in short panels (Nickell, 1981). Particularly for the OECD sample, we have to check whether the bias significantly affects the results. To deal with this problem, we again employ the system GMM estimator as suggested by Arellano and Bover (1995) and Blundell and Bond (1998) in addition to the SUR estimator. Results are based on the two-step estimator implemented by Roodman (2005) in Stata, including Windmeijer's (2005) finite sample correction.

Results: Table 4.5 shows the overall significance of the independent variables in the four-equation system when using the balanced sample of 60 countries covering the 1971–2001 period. In each block, either the KOF globalisation index or one of its sub-dimensions is included. The reported F-statistics test whether a par-

ticular variable can be excluded from all four expenditure-share equations. Table 4.6 shows the results for the sample of OECD countries.

The results for the world sample show that the expenditure shares are significantly affected by their past levels at the one per cent level of significance. The same is true for the lending interest rate, GDP growth and government debt. These results are independent of the globalisation measure included in the system of regressions. The only exception is the age-dependency ratio, which is significant when the index of political integration is included, but not in the other three systems of regressions. Most important for our analysis, it seems that political globalisation significantly affects expenditure shares. The significance of the political dimension of globalisation in the system also partly drives the results for the overall index, which is significant at the ten per cent level. This contrasts with the results reported in Dreher, Sturm and Ursprung (2008), which uses an older version of the KOF Index. Neither economic globalisation nor social globalisation significantly affect expenditure shares.

Turning to the sample of 18 OECD countries, the results show that most control variables are significant. The exception is weighted average expenditure in neighbouring countries, which is never significant. Central government expenditure and inflation only significantly affect expenditure shares when the overall Index of Globalisation is included. GDP growth is significant with the inclusion of the overall Index of Globalisation and the sub-index of economic integration.

Table 4.5 Significance of variables in system regressions (1971–2001, 60 countries, 614 observations, SUR)

	Overall			Economic		
	F-test	p-value		F-test	p-value	
Exp. shares (t-1)	17545.4	0.00	***	22112.42	0.00	***
Weighted average shares	6.34	0.18		4.75	0.31	
Central govt. expenditure	3.86	0.43		3.18	0.53	
Inflation	6.57	0.16		6.18	0.19	
Interest rate	102.61	0.00	***	105.29	0.00	***
GDP growth	13.88	0.01	**	14.71	0.01	**
Age dependency	3.37	0.50		6.25	0.18	
Central govt. debt	19.09	0.00	***	15.63	0.00	***
KOF Index of Globalisation	8.82	0.07	*			
Index of economic globalisation				3.57	0.47	

	Social			Political		
	F-test	p-value		F-test	p-value	
Exp. shares (t-1)	20221	0.00	***	16280.06	0.00	***
Weighted average shares	6.55	0.16		5.17	0.27	
Central govt. expenditure	4.47	0.35		6.29	0.18	
Inflation	6.26	0.18		5.75	0.22	
Interest rate	105.49	0.00	***	101.6	0.00	***
GDP growth	14.79	0.01	**	13.25	0.01	**
Age dependency	7.16	0.13		10.56	0.03	**
Central govt. debt	16.55	0.00	***	23.27	0.00	***
Index of social globalisation	3.35	0.50				
Index of political globalisation				19.41	0.00	***

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.6 Significance of variables in system regressions (1971–2001, 18 OECD countries, 255 observations, SUR)

	Overall			Economic		
	F-test	p-value		F-test	p-value	
Exp. shares (t-1)	5965.07	0.00	***	6641.21	0.00	***
Weighted average shares	5.7	0.22		4.54	0.34	
Central govt. expenditure	8.58	0.07	*	1.32	0.86	
Inflation	8.14	0.09	*	5.52	0.24	
Interest rate	13.83	0.01	**	20.71	0.00	***
GDP growth	8.49	0.08	*	7.87	0.09	*
Age dependency	16.31	0.00	***	15.77	0.00	***
Central govt. debt	23.99	0.00	***	19.27	0.00	***
KOF Index of Globalisation	10.13	0.04	**			
Index of economic globalisation				3.8	0.43	

	Social			Political		
	F-test	p-value		F-test	p-value	
Exp. shares (t-1)	6352.75	0.00	***	6209.46	0.00	***
Weighted average shares	5.35	0.25		6.26	0.18	
Central govt. expenditure	4.88	0.30		6.12	0.19	
Inflation	5.36	0.25		6.83	0.15	
Interest rate	18.57	0.00	***	10.77	0.03	**
GDP growth	7.53	0.11		3.39	0.50	
Age dependency	12.98	0.01	**	11.84	0.02	**
Central govt. debt	18.84	0.00	***	24.96	0.00	***
Index of social globalisation	2.57	0.63				
Index of political globalisation				17.91	0.00	***

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Turning now to the individual impact of the control and globalisation variables, Table 4.7 reports the individual coefficients and significance levels of the results for the world sample presented in Table 4.5. Table 4.8 shows the coefficients corresponding to the OECD sample reported in Table 4.6. First, note that the estimated coefficients of the lagged dependent variables are almost identical and generally greater than 0.92. This implies a degree of inertia in expenditure shares. For the interpretation of the remaining coefficients this similarity implies that the sum of the coefficients of a particular variable across the equations should (and actually does) sum to zero. Given the identical speed of adjustment across all four categories, we can conclude that a positive impact on one expenditure share is effectively neutralised by a negative impact on other expenditure shares.

Table 4.7 Detailed results (1971–2001, 60 countries, 614 observations, SUR)

	(1) goods	(2) subsidies	(3) capital	(4) interest
Exp. shares (t-1)	0.95 (127.85)***	0.95 (130.24)***	0.95 (127.10)***	0.95 (123.87)***
Weighted average shares	-0.06 (1.59)	-0.06 (1.74)*	-0.07 (2.26)**	-0.07 (2.49)**
Central govt. expenditure	-0.03 (1.46)	0.03 (1.52)	0.01 (0.58)	-0.01 (1.02)
Inflation	-0.02 (0.07)	0.54 (1.77)*	-0.60 (2.23)**	0.09 (0.50)
Interest rate	-0.003 (3.83)***	0.002 (2.43)**	-0.003 (3.97)***	0.004 (8.97)***
GDP growth	-0.02 (1.29)	0.00 (0.01)	0.05 (3.17)***	-0.03 (2.50)**
Age dependency	0.03 (0.79)	-0.04 (1.21)	-0.02 (0.58)	0.03 (1.47)
Central govt. debt	0.01 (2.71)***	-0.02 (3.51)***	0.00 (1.04)	0.01 (2.76)***
KOF Index of Globalisation	-0.30 (1.29)	0.67 (2.82)***	-0.22 (1.12)	-0.16 (1.36)
R ²	0.95	0.98	0.92	0.94

Table 4.7 (continued)

	(5) goods	(6) subsidies	(7) capital	(8) interest
Exp. shares (t-1)	0.96 (141.38)***	0.96 (146.55)***	0.96 (139.67)***	0.96 (131.62)***
Weighted average shares	-0.05 (1.14)	-0.05 (1.34)	-0.07 (1.97)**	-0.06 (2.13)**
Central govt. expenditure	-0.03 (1.66)*	0.02 (1.27)	0.01 (0.67)	0.00 (0.35)
Inflation	0.02 (0.07)	0.51 (1.65)*	-0.60 (2.22)**	0.07 (0.43)
Interest rate	-0.003 (3.94)***	0.002 (2.53)**	-0.003 (3.99)***	0.004 (9.03)***
GDP growth	-0.02 (0.97)	-0.01 (0.53)	0.05 (3.37)***	-0.02 (2.48)**
Age dependency	0.06 (1.59)	-0.07 (2.23)**	-0.01 (0.25)	0.03 (1.38)
Central govt. debt	0.01 (2.73)***	-0.01 (3.12)***	0.00 (1.16)	0.01 (2.24)**
Index of economic Globalisation	0.13 (0.59)	0.14 (0.68)	-0.07 (0.38)	-0.21 (1.73)*
R ²	0.95	0.98	0.92	0.94

Table 4.7 (continued)

	(9) goods	(10) subsidies	(11) capital	(12) interest
Exp. shares (t-1)	0.96 (136.15)***	0.96 (139.98)***	0.96 (135.16)***	0.96 (129.22)***
Weighted average shares	-0.06 (1.49)	-0.06 (1.65)*	-0.07 (2.25)**	-0.07 (2.52)**
Central govt. expenditure	-0.03 (1.57)	0.03 (1.62)	0.01 (0.56)	-0.01 (1.07)
Inflation	0.01 (0.03)	0.52 (1.70)*	-0.60 (2.22)**	0.07 (0.41)
Interest rate	-0.003 (3.91)***	0.002 (2.47)**	-0.003 (3.97)***	0.004 (9.08)***
GDP growth	-0.02 (1.02)	-0.01 (0.37)	0.05 (3.31)***	-0.03 (2.59)***
Age dependency	0.05 (1.41)	-0.07 (2.31)**	-0.01 (0.19)	0.03 (1.71)*
Central govt. debt	0.01 (2.69)***	-0.01 (3.17)***	0.00 (1.17)	0.01 (2.46)**
Index of social Globalisation	-0.01 (0.04)	0.19 (1.18)	-0.06 (0.42)	-0.13 (1.53)
R ²	0.95	0.98	0.92	0.94

Table 4.7 (continued)

	(13) goods	(14) subsidies	(15) capital	(16) interest
Exp. shares (t-1)	0.94 (124.35)***	0.94 (126.24)***	0.94 (124.76)***	0.94 (122.04)***
Weighted average shares	-0.06 (1.65)*	-0.06 (1.77)*	-0.07 (2.11)**	-0.07 (2.26)**
Central govt. expenditure	-0.03 (1.67)*	0.04 (2.19)**	0.00 (0.28)	-0.01 (1.38)
Inflation	0.01 (0.04)	0.46 (1.53)	-0.58 (2.14)**	0.10 (0.57)
Interest rate	-0.003 (3.88)***	0.002 (2.59)***	-0.003 (4.00)***	0.004 (8.81)***
GDP growth	-0.02 (1.31)	0.00 (0.19)	0.05 (3.25)***	-0.02 (2.24)**
Age dependency	0.03 (0.85)	-0.06 (2.23)**	-0.01 (0.29)	0.05 (2.79)***
Central govt. debt	0.01 (2.93)***	-0.02 (4.08)***	0.00 (0.83)	0.01 (3.02)***
Index of political Globalisation	-0.46 (3.27)***	0.61 (4.26)***	-0.17 (1.46)	0.01 (0.19)
R ²	0.95	0.98	0.92	0.94

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.8 Detailed results (1971–2001, 18 countries, 255 observations, SUR)

	(1) goods	(2) subsidies	(3) capital	(4) interest
Exp. shares (t-1)	0.93 (74.69)***	0.93 (76.05)***	0.93 (59.83)***	0.92 (63.13)***
Weighted average shares	-0.06 (1.54)	-0.07 (1.96)*	-0.07 (2.25)**	-0.06 (2.08)**
Central govt. expenditure	-0.04 (2.18)**	0.07 (2.83)***	-0.01 (1.29)	-0.02 (1.40)
Inflation	-2.16 (2.59)***	1.57 (1.56)	0.18 (0.43)	0.51 (0.99)
Interest rate	0.046 (1.45)	-0.127 (3.20)***	0.040 (2.34)**	0.044 (2.05)**
GDP growth	-0.10 (2.61)***	0.13 (2.77)***	-0.03 (1.21)	-0.01 (0.22)
Age dependency	0.27 (3.34)***	-0.15 (1.57)	0.00 (0.07)	-0.12 (2.46)**
Central govt. debt	0.00 (0.66)	-0.02 (3.32)***	0.00 (0.38)	0.02 (4.70)***
KOF Index of Globalisation	-0.67 (2.39)**	1.10 (3.13)***	-0.19 (1.27)	-0.26 (1.53)
R ²	0.96	0.97	0.92	0.96

Table 4.8 (continued)

	(5) goods	(6) subsidies	(7) capital	(8) interest
Exp. shares (t-1)	0.94 (77.94)***	0.94 (80.58)***	0.94 (64.57)***	0.93 (64.89)***
Weighted average shares	-0.05 (1.24)	-0.06 (1.68)*	-0.06 (2.05)**	-0.05 (1.79)*
Central govt. expenditure	-0.02 (0.99)	0.02 (0.97)	0.00 (0.52)	0.00 (0.13)
Inflation	-1.66 (1.99)**	1.10 (1.09)	0.20 (0.48)	0.46 (0.90)
Interest rate	0.066 (2.15)**	-0.161 (4.08)***	0.047 (2.85)***	0.052 (2.54)**
GDP growth	-0.09 (2.41)**	0.13 (2.68)***	-0.03 (1.41)	-0.01 (0.27)
Age dependency	0.25 (3.04)***	-0.12 (1.17)	-0.01 (0.19)	-0.13 (2.65)***
Central govt. debt	0.00 (0.10)	-0.01 (2.40)**	0.00 (0.13)	0.02 (4.31)***
Index of economic Globalisation	-0.14 (0.43)	0.57 (1.47)	-0.13 (0.80)	-0.31 (1.61)
R ²	0.96	0.96	0.92	0.96

Table 4.8 (continued)

	(9) goods	(10) subsidies	(11) capital	(12) interest
Exp. shares (t-1)	0.94 (76.42)***	0.94 (78.72)***	0.93 (58.74)***	0.93 (62.33)***
Weighted average shares	-0.06 (1.31)	-0.06 (1.75)*	-0.07 (2.20)**	-0.06 (1.94)*
Central govt. expenditure	-0.02 (1.14)	0.05 (1.91)*	-0.02 (1.57)	-0.01 (0.99)
Inflation	-1.63 (1.93)*	1.03 (1.00)	0.13 (0.29)	0.59 (1.13)
Interest rate	0.064 (2.08)**	-0.153 (3.89)***	0.043 (2.63)***	0.050 (2.37)**
GDP growth	-0.09 (2.37)**	0.12 (2.57)**	-0.03 (1.41)	0.00 (0.11)
Age dependency	0.27 (3.07)***	-0.18 (1.71)*	0.02 (0.42)	-0.11 (2.08)**
Central govt. debt	0.00 (0.11)	-0.02 (2.41)**	0.00 (0.27)	0.02 (4.25)***
Index of social Globalisation	-0.05 (0.29)	0.23 (1.08)	-0.13 (1.40)	-0.07 (0.61)
R ²	0.96	0.97	0.92	0.96

Table 4.8 (continued)

	(13) goods	(14) subsidies	(15) capital	(16) interest
Exp. shares (t-1)	0.93 (76.52)***	0.93 (77.99)***	0.93 (66.56)***	0.92 (66.71)***
Weighted average shares	-0.07 (1.76)*	-0.07 (2.14)**	-0.07 (2.36)**	-0.07 (2.27)**
Central govt. expenditure	-0.03 (2.01)**	0.05 (2.40)**	-0.01 (0.87)	-0.01 (1.07)
Inflation	-1.56 (1.99)**	0.58 (0.61)	0.34 (0.81)	0.71 (1.44)
Interest rate	0.009 (0.28)	-0.092 (2.20)**	0.044 (2.41)**	0.041 (1.86)*
GDP growth	-0.06 (1.59)	0.08 (1.67)*	-0.02 (1.03)	0.00 (0.11)
Age dependency	0.19 (2.32)**	-0.05 (0.50)	0.00 (0.10)	-0.14 (2.72)***
Central govt. debt	0.01 (1.16)	-0.02 (3.61)***	0.00 (0.01)	0.02 (4.70)***
Index of political Globalisation	-0.57 (3.89)***	0.70 (3.82)***	-0.02 (0.22)	-0.12 (1.32)
R ²	0.96	0.97	0.92	0.96

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

For the world sample shown in Table 4.7, the share of goods expenditures declines significantly with higher interest rates and greater central government debt, while the share of subsidies increases with these variables. Higher inflation and lower GDP growth significantly reduce expenditure shares on capital and increases interest payments. Central government expenditures are completely insignificant in most regressions and so too is the age-dependency ratio.

Turning to the globalisation variables, the results show that globalisation increases the share of subsidies, lending some support to the compensation hypothesis. As can be seen, the results seem to be driven by political globalisation. At the one per cent level of significance, political globalisation increases the share of subsidies, but reduces the share of goods. At the ten per cent level of significance, economic globalisation reduces the share of expenditures spent on interest. The results are similar in the OECD sample reported in Table 4.8. Focussing on the impact of globalisation, the table shows that the share of goods declines significantly with increased globalisation, while the share of subsidies increases. Again, the results are driven by the political dimension of globalisation, while the globalisation variables are completely insignificant in all other specifications.

Next, we replicate the entire analysis employing the consistent system GMM estimator. Again, the covariates used above are included in all regressions. We employ the Sargan test to check whether the instruments are uncorrelated with the error term as well as the Arellano-Bond test for second-order autocorrelation in the first difference residuals. With very few exceptions, both tests fail to reject the specifications estimated. The results are summarised in Tables 4.9 and 4.10.

Table 4.9 Detailed results (1971–2001, 60 countries, 614 observations, GMM)

	(1) goods	(2) subsidies	(3) capital	(4) interest
Exp. shares (t-1)	0.58 (5.62)***	0.90 (10.87)***	0.86 (5.41)***	0.76 (5.55)***
Weighted average shares	0.28 (1.73)*	-0.06 (0.49)	-0.08 (0.50)	-0.09 (0.90)
Central govt. expenditure	-0.14 (1.46)	0.07 (0.95)	0.00 (0.01)	-0.06 (1.33)
Inflation	-0.35 (1.51)	0.50 (3.34)***	-0.61 (4.34)***	0.12 (0.96)
Interest rate	-0.001 (1.24)	0.001 (1.74)*	-0.003 (6.84)***	0.004 (3.82)***
GDP growth	-0.10 (1.73)*	-0.01 (0.14)	0.06 (1.33)	-0.02 (0.83)
Age dependency	0.54 (2.61)***	-0.16 (1.43)	0.05 (1.03)	-0.01 (0.16)
Central govt. debt	0.00 (0.19)	-0.02 (1.49)	0.00 (0.26)	0.04 (2.09)**
KOF Index of Globalisation	0.13 (0.11)	0.44 (0.55)	-0.15 (0.17)	-0.52 (1.20)
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.34	0.03	0.37	0.72

Table 4.9 (continued)

	(5) goods	(6) subsidies	(7) capital	(8) interest
Exp. shares (t-1)	0.56 (5.27)***	0.89 (11.24)***	0.80 (5.08)***	0.79 (7.14)***
Weighted average shares	0.50 (3.16)***	-0.03 (0.29)	-0.16 (0.92)	-0.09 (0.86)
Central govt. expenditure	-0.18 (1.82)*	0.08 (0.98)	-0.02 (0.29)	-0.03 (0.64)
Inflation	-0.32 (1.52)	0.44 (2.41)**	-0.60 (3.54)***	0.11 (0.86)
Interest rate	-0.001 (0.99)	0.001 (1.89)*	-0.003 (6.36)***	0.004 (4.71)***
GDP growth	-0.11 (1.75)*	-0.01 (0.28)	0.05 (1.42)	-0.02 (0.83)
Age dependency	0.67 (1.81)*	-0.22 (1.13)	0.10 (0.69)	-0.03 (0.28)
Central govt. debt	0.01 (0.27)	-0.02 (1.43)	0.00 (0.16)	0.04 (2.03)**
Index of economic Globalisation	1.33 (0.53)	-0.17 (0.13)	-0.01 (0.01)	-0.74 (0.70)
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.32	0.03	0.37	0.77

Table 4.9 (continued)

	(9) goods	(10) subsidies	(11) capital	(12) interest
Exp. shares (t-1)	0.58 (5.22)***	0.89 (10.12)***	0.85 (4.62)***	0.75 (5.14)***
Weighted average shares	0.33 (1.98)**	-0.03 (0.23)	-0.07 (0.47)	-0.12 (1.11)
Central govt. expenditure	-0.15 (1.43)	0.08 (0.92)	-0.01 (0.08)	-0.07 (1.56)
Inflation	-0.33 (1.45)	0.55 (4.05)***	-0.60 (4.39)***	0.09 (0.86)
Interest rate	-0.002 (1.29)	0.001 (1.68)*	-0.003 (6.60)***	0.004 (3.72)***
GDP growth	-0.08 (1.45)	-0.01 (0.17)	0.05 (1.24)	-0.03 (0.92)
Age dependency	0.68 (2.95)***	-0.22 (1.36)	0.04 (0.64)	0.00 (0.01)
Central govt. debt	0.00 (0.17)	-0.02 (1.33)	0.00 (0.21)	0.04 (2.10)**
Index of social Globalisation	1.45 (1.70)*	-0.04 (0.10)	-0.20 (0.46)	-0.37 (1.36)
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.35	0.03	0.37	0.71

Table 4.9 (continued)

	(13) goods	(14) subsidies	(15) capital	(16) interest
Exp. shares (t-1)	0.59 (5.75)***	0.86 (9.22)***	0.87 (5.48)***	0.76 (5.50)***
Weighted average shares	0.30 (1.80)*	-0.01 (0.04)	-0.09 (0.55)	-0.12 (1.15)
Central govt. expenditure	-0.13 (1.62)	0.09 (1.20)	0.01 (0.11)	-0.06 (1.44)
Inflation	-0.30 (1.13)	0.52 (4.36)***	-0.54 (3.80)***	0.11 (0.91)
Interest rate	-0.002 (1.48)	0.001 (1.74)*	-0.003 (7.37)***	0.004 (3.68)***
GDP growth	-0.11 (1.96)*	0.00 (0.06)	0.06 (1.61)	-0.02 (0.73)
Age dependency	0.40 (2.22)**	-0.19 (1.39)	0.02 (0.50)	0.03 (0.61)
Central govt. debt	0.01 (0.47)	-0.03 (1.63)	0.00 (0.27)	0.04 (2.03)**
Index of political Globalisation	-1.30 (1.96)*	0.88 (1.33)	-0.29 (0.52)	-0.14 (0.55)
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.33	0.03	0.37	0.71

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.10 Detailed results (1971–2001, 18 countries, 255 observations, GMM)

	(1) goods	(2) subsidies	(3) capital	(4) interest
Exp. shares (t-1)	1.02 (19.71)***	0.90 (19.52)***	0.66 (7.29)***	0.68 (5.34)***
Weighted average shares	0.10 (0.64)	0.04 (0.35)	-0.09 (1.68)*	0.05 (0.52)
Central govt. expenditure	-0.01 (0.28)	0.08 (2.27)**	0.00 (0.03)	-0.09 (2.14)**
Inflation	-0.91 (1.32)	1.79 (2.32)**	-0.05 (0.13)	1.00 (1.44)
Interest rate	0.016 (0.26)	-0.149 (1.50)	0.081 (2.46)**	0.051 (0.70)
GDP growth	-0.09 (1.11)	0.16 (1.59)	0.01 (0.38)	-0.04 (0.87)
Age dependency	0.09 (0.86)	-0.22 (1.29)	0.01 (0.08)	-0.15 (1.14)
Central govt. debt	0.01 (1.05)	-0.03 (2.25)**	-0.01 (0.81)	0.07 (2.31)**
KOF Index of Globalisation	-0.33 (0.84)	1.31 (1.71)*	-0.38 (1.20)	-1.28 (3.99)***
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.80	0.37	0.31	0.55

Table 4.10 (continued)

	(5) goods	(6) subsidies	(7) capital	(8) interest
Exp. shares (t-1)	0.99 (15.37)***	0.95 (8.69)***	0.71 (9.87)***	0.70 (5.74)***
Weighted average shares	0.16 (0.91)	0.07 (0.60)	-0.12 (2.03)**	0.00 (0.00)
Central govt. expenditure	-0.03 (0.98)	0.00 (0.16)	0.01 (0.64)	-0.01 (0.21)
Inflation	-0.71 (0.92)	1.50 (1.28)	0.05 (0.13)	0.32 (0.52)
Interest rate	0.044 (0.52)	-0.149 (0.99)	0.088 (2.86)***	0.108 (1.34)
GDP growth	-0.08 (0.95)	0.15 (1.27)	0.00 (0.04)	-0.08 (1.44)
Age dependency	0.21 (1.11)	-0.10 (0.45)	0.00 (0.00)	-0.27 (1.53)
Central govt. debt	0.00 (0.09)	-0.02 (0.85)	-0.01 (0.91)	0.07 (2.32)**
Index of economic Globalisation	0.91 (1.11)	0.92 (0.84)	-0.41 (0.97)	-2.25 (2.46)**
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.79	0.37	0.32	0.48

Table 4.10 (continued)

	(9) goods	(10) subsidies	(11) capital	(12) interest
Exp. shares (t-1)	0.93 (13.59)***	0.87 (13.22)***	0.63 (7.06)***	0.63 (6.54)***
Weighted average shares	0.14 (0.80)	0.07 (0.55)	-0.14 (2.99)***	0.01 (0.24)
Central govt. expenditure	0.04 (0.73)	0.03 (0.59)	-0.03 (1.10)	-0.10 (2.42)**
Inflation	-0.81 (0.98)	1.06 (1.65)*	-0.35 (1.12)	1.41 (1.82)*
Interest rate	0.106 (1.51)	-0.247 (1.99)**	0.078 (2.42)**	0.113 (1.40)
GDP growth	-0.10 (1.31)	0.16 (1.65)*	0.01 (0.28)	-0.06 (1.32)
Age dependency	0.17 (0.80)	-0.27 (1.07)	0.10 (0.88)	-0.10 (0.97)
Central govt. debt	0.00 (0.51)	-0.02 (1.28)	-0.01 (0.88)	0.08 (2.76)***
Index of social Globalisation	0.86 (1.68)*	-0.36 (0.71)	-0.56 (2.47)**	-0.38 (1.94)*
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.76	0.33	0.29	0.39

Table 4.10 (continued)

	(13) goods	(14) subsidies	(15) capital	(16) interest
Exp. shares (t-1)	0.79 (13.79)***	0.67 (4.46)***	0.70 (6.40)***	0.65 (5.49)***
Weighted average shares	0.05 (0.62)	0.04 (0.43)	-0.10 (1.81)*	-0.04 (0.47)
Central govt. expenditure	-0.07 (1.51)	0.16 (1.36)	0.01 (0.38)	-0.08 (1.88)*
Inflation	-2.75 (2.54)**	2.05 (1.35)	0.04 (0.10)	1.71 (1.86)*
Interest rate	0.026 (0.48)	-0.228 (1.53)	0.107 (3.06)***	0.054 (0.68)
GDP growth	-0.09 (0.89)	0.12 (0.91)	0.01 (0.20)	-0.02 (0.50)
Age dependency	0.34 (1.26)	-0.31 (0.66)	0.06 (0.55)	-0.28 (1.78)*
Central govt. debt	0.01 (0.87)	-0.07 (1.83)*	-0.01 (1.32)	0.08 (2.55)**
Index of political Globalisation	-1.22 (2.04)**	1.86 (2.18)**	0.25 (1.21)	-0.78 (3.68)***
Sargan test (p-level)	0.99	0.99	0.99	0.99
Arellano-Bond test (p-level)	0.79	0.31	0.33	0.56

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.9 reports results for the world sample and Table 4.10 contains results for the restricted sample of OECD countries. As can be seen, the GMM estimates are consistent with the previous results. In the world sample, the share of goods declines with higher political integration, at the ten per cent level of significance. In the OECD sample, the results for political globalisation are confirmed. Moreover, there is evidence that globalisation – economic, social and political – reduces the expenditure share on interest. Social globalisation increases the share spent on goods and reduces that of capital.

Summary: Economic theory suggests that different kinds of government expenditures are likely to react differently to globalisation. According to the disciplining hypothesis, globalisation restrains governments by inducing increased budgetary pressure. Consequently, governments shift their expenditures away from transfers and subsidies towards, e.g., capital expenditures. The compensation effect, on the other hand, is expected to give rise to a higher share of social expenditures. The expenditure shift induced by the disciplining effect might therefore be diminished, neutralised or even reversed by citizens' preferences to be compensated for the risks of globalisation.

Contrary to Dreher, Sturm and Ursprung (2008), our econometric analyses did indeed reveal globalisation-induced effects on the composition of government expenditures. Overall, the most robust set of results appears to support the compensation hypothesis: countries that are more politically globalised spend higher shares of their expenditure on subsidies and lower shares on goods. Even for unchanged levels of government expenditures, globalisation seems to exert an influence on government spending.

4.3 Does globalisation spur economic growth?

The effects of globalisation on growth have frequently been analysed using conventional measures of globalisation. However, most empirical research has used cross sectional data.⁴⁸ Typical of many studies, Dollar (1992) analysed the relationship between economic performance and openness to trade and Frankel and Romer (1996) the relationship between growth and trade flows.⁴⁹ These studies find that both openness to trade and trade flows are robustly related to growth. Apart from being cross sectional studies, there is no adequate control for endoge-

⁴⁸ For example, Chanda (2001) uses an index of capital account openness to show that the majority of developing countries have suffered from globalisation, while Rodrik (1998a) as well as Alesina, Grilli and Milesi-Ferretti (1994) found no effect of capital account openness on economic growth. Edison et al. (2002a) summarise the literature on capital account liberalisation and economic performance.

⁴⁹ As for FDI, there is evidence of a positive effect on growth in wealthy countries (e.g., Blomström, Lipsey and Zejan, 1992) and a negative one for low income countries (e.g., Garrett, 2001). Studies examining the effects of FDI on growth rates are surveyed by Durham (2000).

neity. The results may therefore reflect unobserved characteristics that do not vary over time, rather than being the consequence of globalisation or the result of reverse causality.⁵⁰

More recent studies use panel data to examine the relationship between various dimensions of globalisation and economic growth.⁵¹ While these studies provide detailed analyses of sub-dimensions of globalisation, none of them examine the overall consequences of globalisation on economic growth. The effects reported for one dimension of globalisation may therefore appear only because other important aspects of globalisation are omitted from the analysis. Most dimensions of globalisation are strongly related to one another, so including them separately in a regression induces collinearity problems. Excluding those dimensions that are not the primary focus of the analysis – the method preferred in the literature – can therefore severely bias estimates. To address these deficiencies, the overall effects of the dimensions of globalisation on growth are now examined empirically in a panel setting. Since many of these dimensions are highly correlated, it is impossible to include them all individually in one regression. Using the KOF Indices is a preferable approach.

Table 4.11 Globalisation and economic growth, low vs. high income (1970–2005)

	1970– 1975	1976– 1980	1981– 1985	1986– 1990	1991– 1995	1996– 2000	2001– 2005
Countries with low globalisation	3.06	2.06	0.12	0.78	–0.58	1.50	1.27
Number of countries	76	77	78	75	66	44	27
Countries with high globalisation	3.15	2.63	0.88	1.38	–0.21	2.73	2.56
Number of countries	47	54	76	92	113	141	158
H ₀ : mean(low)-mean(high)=0 (P> t)	0.45	0.18	0.10	0.21	0.34	0.07	0.03

Note: Indicates GDP per capita growth rates in percentage in countries with an overall globalisation index smaller and greater than the index-mean of 43.63, respectively (one-sided test).

⁵⁰ Dollar and Kraay (2001, p. 13) summarise criticisms of this approach.

⁵¹ Among them, Dollar and Kraay (2001) find that an increase in trade flows and FDI results in higher growth rates. Greenaway, Morgan and Wright (1999) also report a strong relationship between trade and growth. With respect to FDI, Borensztein, de Gregorio and Lee (1998) provide evidence of a positive growth effect – given a minimum threshold stock of human capital. Carkovic and Levine (2002), on the contrary, do not find a robust effect of FDI on growth. A detailed analysis of the impact of several indicators on financial integration and growth is provided by Edison et al. (2002b), who find that no robust relationship exists.

Empirical Estimates: Table 4.11 presents evidence on the relationship between growth and globalisation. The countries are separated into two sub-samples according to their overall index score. The index mean of 43.63 is used to distinguish between more and less globalised countries. As can be seen, more globalised countries grew faster in each five year period. A one-sided *t*-test indicates that the hypothesis of equal means can be rejected at the ten per cent level at least between 1981–1985, 1996–2000 and 2001–2005. To analyse this relationship in greater detail, pooled time-series cross-section regressions are estimated. The dependent variable is the growth rate of per capita GDP. The data are again five-year averages and cover the time period 1970–2004 for 122 countries. Since some of the data are not available for all countries or all years, the panel is unbalanced and the number of observations depends on the choice of explanatory variables. To account for time-invariant unobservable heterogeneity potentially correlated with the regressors, a fixed effects specification is estimated. A dummy for each of the five-year-periods is also included. All standard errors are estimated robustly. The variables, their precise definitions and data sources are listed in the Appendix.

Table 4.12 Globalisation and economic growth (1970–2004)

	(1)	(2)	(3)	(4)	(5)	(6)
		GDP p.c. growth			Log (GDP p.c.), end of period	
KOF Index of Globalisation		0.089 (2.21)**	0.104 (1.91)*	0.105 (2.53)**	0.011 (1.96)*	
Index of economic globalisation						-0.001 (0.38)
Index of social globalisation						0.008 (2.66)***
Index of political globalisation						0.002 (0.94)
Log (GDP p.c.), beginning of period	-4.505 (5.12)***	-4.714 (5.14)***	-4.664 (4.01)***	-5.173 (5.42)***	0.577 (3.04)***	0.550 (3.05)***

Table 4.12 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)
Secondary school enrolment	0.032 (2.29)**	0.033 (2.34)**	0.026 (1.24)	0.031 (2.11)**	0.002 (1.22)	0.001 (0.64)
Rule of law	0.303 (1.82)*	0.291 (1.77)*	0.167 (0.95)	0.307 (1.81)*	0.018 (1.53)	0.014 (1.37)
Log (life expectancy)	-0.484 (0.15)	-1.147 (0.39)	-2.292 (0.45)	-1.278 (0.44)	0.118 (0.32)	0.156 (0.50)
Log (fertility rate)	-1.847 (2.00)**	-1.594 (1.68)*	-1.901 (1.37)	-2.428 (2.56)**	0.066 (0.71)	0.144 (1.37)
Investment (percentage of GDP)	0.175 (4.85)***	0.174 (4.77)***	0.223 (4.52)***	0.162 (4.32)***	0.004 (0.94)	0.002 (0.55)
Government consumption (percentage of GDP)	-0.144 (2.13)**	-0.147 (2.19)**	-0.191 (2.09)**	-0.144 (2.13)**	-0.000 (0.06)	-0.007 (1.12)
Inflation rate	-0.079 (1.64)	-0.078 (1.95)*	-0.071 (0.46)	-0.079 (1.93)*	0.002 (1.59)	0.001 (0.90)
Liquid liabilities			-2.218 (1.51)			
Stock market capitalisation			0.025 (0.03)			
Political rights				-0.008 (0.03)		
Civil liberties				-0.236 (0.74)		
Democracy, index				-0.090 (1.34)		
Estimation method	OLS	OLS	OLS	OLS	GMM	GMM
Number of countries	121	113	81	108	99	93
Number of observations	417	406	249	391	250	240
R ²	0.72	0.71	0.71	0.72		
Sargan test (p-level)					0.03	0.21
Arellano-Bond test (p-level)					0.95	0.84

Robust t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

The first column of Table 4.12 includes variables typically employed in growth regressions (e.g., Barro, 1997). The initial level of GDP per capita for each of the five-year periods is included to measure the conditional rate of convergence to the steady state growth rate. Secondary school enrolment and the log of life expectancy are employed as indicators of human capital. Since higher population growth should directly lead to lower per capita economic growth, the log of the fertility rate is also included. Higher domestic investment as a share of GDP should lead to higher growth rates, whereas the effect of higher government consumption is not obvious a priori. On the one hand, a large government sector may induce inefficiencies and crowd out the private sector. On the other, the provision of an efficient infrastructure and a proper legal framework may promote growth (Hansson, 2000). To account for the quality of the legal system and the enforceability of property rights, a rule of law index constructed by Gwartney and Lawson (2006) is included in the regressions. Better institutions “should” promote growth. Finally, we include a country’s rate of inflation which has a significant effect on growth in previous studies.

Most of the results qualitatively correspond to those of Barro (1997). Higher initial GDP is significantly associated with lower growth rates. Higher government consumption also leads to lower growth. The same is true for low investment and low fertility. Growth rates are higher with better institutions and higher school enrolment. While the coefficients of those variables are significant at the ten per cent level or better, the coefficient of life expectancy is not significant at conventional levels. The rate of inflation has the expected negative coefficient, but is marginally insignificant.

Column 2 includes the overall Index of Globalisation. As can be seen, its coefficient is positive and significant at the five per cent level. The coefficient of the index shows that a one point increase would expand GDP per capita growth by 0.09 percentage points. For example, if Costa Rica were as integrated with the world as Mexico is, all else being equal, it could raise its growth rate from its present 1.14 per cent to 1.23 per cent. The rate of inflation is now significant at the ten per cent level, while the other results remain unchanged. The regression includes 113 countries with an average 3.6 observations. It explains 71 per cent of the dependent variable’s variation.

King and Levine (1993) argue that the quality of a country’s financial markets can influence economic growth. In column 3, variables to account for this quality are included. Liquid liabilities are a typical measure of the financial depth and thus overall size of the financial sector, while stock market capitalisation (relative to GDP) is an indicator of the size of the stock market. However, reaffirming the results of Chanda (2001), these variables are completely insignificant. Due to missing data, the number of observations is reduced dramatically. This results in generally lower *t*-statistics. School enrolment, the rule of law, fertility rates and inflation no longer significantly influence growth. The globalisation index, however, is significant at the ten per cent level.

In recent years, the impact of political and institutional variables on economic growth has been highlighted.⁵² For example, Sala-i-Martin (1997) reports a positive influence of civil liberties and political rights on growth. Another variable frequently included in growth regressions is an index of democracy (e.g., Sala-i-Martin, 1997; Fernandez, Ley and Steel, 2001). Column 4 tests for these impacts. It includes the political rights and civil liberties index constructed by Gastil (2002) and the Polity IV indicator of democracy.⁵³ However, none of these variables have a significant influence on economic growth.⁵⁴ Again, the globalisation index retains its significance.

With some of the variables there is an obvious endogeneity problem. Previous research has shown that fertility is influenced by measures of wealth (e.g., Barro and Lee, 1994). If fertility declines with growth, then it is endogenous. The same is true for government consumption and investment. Endogeneity might even be a problem for the Index of Globalisation itself. Accordingly, the Arellano-Bover system GMM estimator is again used, i.e., the right-hand side variables are instrumented and the validity of the exogeneity assumption is tested.⁵⁵

Following Dollar and Kraay (2001), we regress the natural logarithm of per capita GDP at the end of a five-year period on its lag and other variables, as opposed to regressing the growth rate on these variables.

Column 5 presents the GMM results. The lagged dependent variable is treated as being endogenous and the Index of Globalisation as pre-determined. As before, time dummies are included in the regression. The results of the Sargan test on the validity of the instruments used are reported as well as the Arellano-Bond test of second order autocorrelation. Applying this estimator leads to a dramatic loss of observations, since information from two periods is discarded by differencing and instrumenting. This results in generally lower *t*-statistics, with most covariates being not significant at conventional levels. GDP per capita at the beginning of the period is now significantly positive.⁵⁶ The Index of Globalisation is significant at the ten per cent level. The estimate shows that a one point increase in the globalisation index increases GDP growth by one percentage point. Calculating yearly growth rates, the average rate thus equals about five per cent, somewhat lower than the previous result of nine per cent.

As can be seen from column 3, the Sargan test fails to reject the over-identifying restrictions at the ten per cent level of significance, but rejects them at

⁵² Carmignani (2001) provides an overview.

⁵³ The Polity IV index was developed by Marshall and Jaggers (2003).

⁵⁴ In comparing these results to those of cross-sectional studies, note that the country fixed effects employed here do not give much room for institutional variables to affect growth.

⁵⁵ Moreover, the GMM estimator is consistent, whereas the within-groups estimator is inconsistent in the presence of a lagged dependent variable in a short panel (Nickell, 1981).

⁵⁶ This confirms the results of Dollar and Kraay (2001). Note that initial GDP is not significant when per capita GDP growth is used as the dependent variable, while most of the other results are unchanged. In particular, the choice of dependent variable has no impact on the influence of the Index of Globalisation.

the five per cent level. Consequently, we replicate the regression treating inflation and government consumption as predetermined instead of as strictly exogenous. While the Sargan test now clearly fails to reject the over-identifying restrictions, the results are unchanged (and are therefore not reported in Table 4.12). The Arellano-Bond test of second order autocorrelation clearly fails to reject the model specification.

While the overall effect of globalisation on growth was found to be positive, it is interesting to examine the effects of the individual components. It is not obvious that economic, cultural and political dimensions of globalisation will necessarily reinforce each other (Brown et al., 2000, p. 280). As column 6 shows, only social integration is correlated with growth rates. Neither economic nor political integration seem to have any influence on economic growth. One potential problem with this specification results from the correlation between the three sub-indices (as discussed above). This results in lower *t*-statistics. Therefore, the three dimensions of globalisation are also analysed separately below. In an effort to provide more detailed information, we replicate the analysis with the sub-indices instead of the overall Index of Globalisation.

Table 4.13 Economic dimensions of globalisation and economic growth (1970–2004)

	(1)	(2)	(3)	(4)
		GDP p.c. growth		
Index of economic globalisation	0.033 (1.23)			
Index of actual economic flows		0.025 (1.66)*		
Index of restrictions			0.027 (1.03)	
Restrictions, low income countries				-0.049 (1.23)
Restrictions, middle income countries				0.048 (1.82)*
Restrictions, high income countries				0.124 (3.29)***
Log (GDP p.c.), beginning of period	-4.370 (4.78)***	-4.259 (4.73)***	-5.263 (5.43)***	-6.455 (6.41)***
Secondary school enrolment	0.038 (2.52)**	0.034 (2.16)**	0.027 (1.67)*	0.023 (1.47)
Rule of law	0.299 (1.71)*	0.333 (1.88)*	0.357 (1.92)*	0.330 (1.75)*
Log (life expectancy)	-1.318 (0.44)	0.382 (0.12)	-2.158 (0.70)	-2.556 (0.84)
Log (fertility rate)	-2.071 (2.22)**	-2.131 (2.23)**	-2.169 (2.09)**	-2.656 (2.55)**
Investment (percentage of GDP)	0.183 (4.80)***	0.175 (4.46)***	0.175 (4.15)***	0.202 (4.82)***
Government consumption (percentage of GDP)	-0.129 (1.84)*	-0.110 (1.54)	-0.108 (1.46)	-0.167 (2.07)**
Inflation rate	-0.075 (1.77)*	-0.071 (1.68)*	-0.341 (0.74)	-0.145 (0.31)
Estimation method	OLS	OLS	OLS	OLS
Number of countries	105	104	82	82
Number of observations	384	379	311	311
R ²	0.69	0.69	0.68	0.70

Table 4.13 (continued)

	(5)	(6)	(7)	(8)
	Log (GDP p.c.), end of period			
Index of economic globalisation	0.001 (0.28)			
Index of actual economic flows		0.002 (0.58)		
Index of restrictions			-0.002 (0.75)	
Restrictions, low income countries				-0.005 (2.29)**
Restrictions, middle income countries				0.003 (1.27)
Restrictions, high income countries				0.008 (1.71)*
Log (GDP p.c.), beginning of period	0.410 (2.21)**	0.434 (2.27)**	0.565 (3.09)***	0.569 (4.34)***
Secondary school enrolment	0.001 (0.62)	0.000 (0.02)	0.001 (0.55)	0.001 (1.03)
Rule of law	0.018 (1.71)*	0.016 (1.62)	0.018 (1.19)	0.017 (1.64)
Log (life expectancy)	0.064 (0.19)	-0.059 (0.22)	-0.037 (0.14)	-0.005 (0.02)
Log (fertility rate)	0.183 (1.90)*	0.135 (1.09)	0.167 (1.40)	0.041 (0.36)
Investment (percentage of GDP)	0.005 (1.02)	0.005 (0.90)	0.010 (1.93)*	0.013 (3.70)***
Government consumption (percentage of GDP)	0.003 (0.68)	0.001 (0.19)	-0.001 (0.11)	-0.006 (1.52)
Inflation rate	0.001 (1.10)	0.001 (1.18)	-0.012 (0.45)	0.019 (0.85)
Estimation method	GMM	GMM	GMM	GMM
Number of countries	93	92	76	76
Number of observations	240	235	195	195
Sargan test (p-level)	0.11	0.04	0.16	0.56
Arellano-Bond test (p-level)	0.34	0.37	0.41	0.88

Robust t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.13 starts with economic integration. There are various reasons why economic integration should promote growth. Trade makes it possible to exploit comparative advantages and countries gain from specialisation. Romer (1993) argues that FDI may serve to close “idea gaps” between developing and developed countries. One channel through which this operates is via management educated in advanced industrial countries. This management may try to press for reforms in order to improve the business environment and enhance profits. Since there may be spillover effects, FDI could increase the productivity of the whole economy (Boockmann and Dreher, 2003; Rappaport, 2000). Workers from other countries probably produce similar effects. Openness to international trade should promote growth since it encourages gains from trade and fosters innovation and efficient production. The effects of capital controls on growth are less obvious a priori. With open capital accounts, countries in need of capital can borrow abroad to finance investment, which promotes growth. Note however, government intervention probably results in inefficiencies and under-investment, while it could also promote corruption.⁵⁷ On the other hand, however, such controls can ensure that domestic savings are channelled towards domestic investment (e.g., Chanda, 2001, p. 5). In some cases, capital controls increase the flexibility of monetary and fiscal policy that could, in turn, increase domestic growth rates.

Column 1 shows the results for the economic integration sub-index estimated by OLS. As can be seen, overall, higher economic integration is not associated with higher growth. However, actual flows promote growth rates at the ten per cent level of significance (column 2), while restrictions on trade and capital do not have a significant influence (column 3).

The insignificant coefficient of restrictions could reflect an average of the benefits from liberalisation in countries with highly developed financial markets and institutions and the costs associated with a higher frequency of financial crises in LDCs. According to the World Bank (2002, p. 10), integration with global capital markets can lead to disastrous results without sound domestic financial systems. Garrett (2001) suggests that capital account openness promotes growth only in more developed countries. We therefore employ interactions of the restrictions sub-index with dummies for low, middle and high levels of GDP. The results are reported in column 4. We find that freedom from restrictions significantly promotes growth in middle and high income countries. In low income countries, the coefficient of the interaction is insignificant.⁵⁸ The insignificant coefficient does, however, not necessarily mean that liberalisation does not have any influence on growth in these countries. Even in the absence of a direct effect, lower tariffs lead to more trade and liberalisation of the capital account, which promotes FDI. Therefore, the absence of restrictions could increase growth rates indirectly.

⁵⁷ Dreher and Siemers (2005) show that capital account restrictions and corruption tend to reinforce one other.

⁵⁸ To analyse this relationship in more detail, we also interacted the index with the measures of financial market quality introduced above and with the rule of law index. All resulting coefficients are, however, completely insignificant. This result is consistent with Rodrik (1998a).

Columns 5–7 report results estimated with the GMM estimator. Confirming the OLS results, the overall sub-index and the index of restrictions do not significantly influence growth. In contrast to the OLS results, actual economic flows do not significantly affect growth rates. Note that the Sargan test rejects the instruments at the five per cent level in column 6. We therefore treated the rate of inflation and government consumption as predetermined instead of strictly exogenous. However, the results remain unchanged (and are not reported in Table 4.13). The overall picture mirrors the OLS results when the interaction terms are included. The absence of restrictions in high income countries significantly promotes growth. In low income countries, on the contrary, the absence of restrictions reduces growth, while restrictions do not significantly affect growth in middle income countries. Both the Sargan test and the Arellano-Bond test of second-order autocorrelation now fail to reject the specification at conventional levels.

Table 4.14 Social dimensions of globalisation and economic growth (1970–2004)

	(1)	(2)	(3)	(4)
		GDP p.c. growth		
Index of social globalisation	0.078 (2.95)***			
Index of personal contact		0.113 (2.57)**		
Index of information flows			0.039 (2.32)**	
Index of cultural globalisation				0.027 (2.19)**
Log (GDP p.c.), beginning of period	-4.863 (5.30)***	-6.027 (5.88)***	-4.334 (4.88)***	-4.554 (5.08)***
Secondary school enrolment	0.035 (2.54)**	0.024 (1.56)	0.042 (2.87)***	0.032 (2.32)**
Rule of law	0.263 (1.70)*	0.215 (1.15)	0.303 (1.77)*	0.279 (1.79)*
Log (life expectancy)	-0.904 (0.29)	-4.211 (0.80)	-2.193 (0.70)	-0.807 (0.26)
Log (fertility rate)	-1.971 (2.14)**	-3.280 (2.93)***	-2.074 (2.34)**	-1.830 (2.01)**
Investment (percentage of GDP)	0.179 (5.00)***	0.238 (6.71)***	0.183 (4.99)***	0.183 (5.18)***
Government consumption (percentage of GDP)	-0.172 (2.61)***	-0.167 (2.12)**	-0.166 (2.43)**	-0.157 (2.42)**
Inflation rate	-0.081 (1.87)*	-0.144 (0.58)	-0.072 (1.60)	-0.084 (1.86)*
Estimation method	OLS	OLS	OLS	OLS
Number of countries	113	87	108	113
Number of observations	406	325	392	406
R ²	0.71	0.72	0.68	0.71

Table 4.14 (continued)

	(5)	(6) ^a	(7)
	Log (GDP p.c.), end of period		
Index of social globalisation	0.004 (1.06)	0.006 (1.97)*	
Index of personal contact			0.014 (2.29)**
Log (GDP p.c.), beginning of period	0.588 (2.15)**	0.393 (3.62)***	0.163 (0.84)
Secondary school enrolment	0.001 (1.05)	0.001 (1.45)	0.000 (0.30)
Rule of law	0.020 (1.85)*	0.015 (1.67)*	0.013 (1.23)
Log (life expectancy)	0.167 (0.40)	0.203 (0.64)	0.450 (1.56)
Log (fertility rate)	0.090 (0.98)	0.158 (1.90)*	0.006 (0.05)
Investment (percentage of GDP)	0.005 (1.00)	0.004 (1.02)	0.001 (0.26)
Government consumption (percentage of GDP)	0.001 (0.13)	-0.004 (0.57)	0.000 (0.03)
Inflation rate	0.001 (0.85)	0.002 (1.56)	0.014 (0.64)
Estimation method	GMM	GMM	GMM
Number of countries	99	99	78
Number of observations	250	250	201
Sargan test (p-level)	0.07	0.29	0.49
Arellano-Bond test (p-level)	0.96	0.52	0.98

Table 4.14 (continued)

	(8)	(9) ^a	(10)
	Log (GDP p.c.), end of period		
Index of information flows	0.001 (0.29)	0.002 (0.93)	
Index of cultural globalisation			0.003 (2.16)**
Log (GDP p.c.), beginning of period	0.431 (2.05)**	0.423 (3.22)***	0.877 (3.12)***
Secondary school enrolment	0.001 (0.86)	0.001 (0.86)	0.002 (1.26)
Rule of law	0.021 (2.28)**	0.011 (1.01)	0.017 (1.73)*
Log (life expectancy)	0.066 (0.19)	0.308 (1.10)	0.068 (0.21)
Log (fertility rate)	0.124 (1.60)	0.185 (2.32)**	0.046 (0.54)
Investment (percentage of GDP)	0.005 (1.41)	0.002 (0.59)	0.010 (1.84)*
Government consumption (percentage of GDP)	0.005 (1.03)	-0.009 (1.27)	-0.003 (0.41)
Inflation rate	0.000 (0.38)	0.002 (2.18)**	0.001 (1.36)
Estimation method	GMM	GMM	GMM
Number of countries	95	95	99
Number of observations	242	242	250
Sargan test (p-level)	0.07	0.28	0.33
Arellano-Bond test (p-level)	0.56	0.37	0.98

Robust t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

^a Government consumption and inflation treated as predetermined.

Table 4.14 reports the results for the social dimension. As Boockmann and Dreher (2003) point out, the means of information and communication may prove important since it relays information about economic success in other countries. Exposure to such information may provoke discussions, which result in the acceptance of new concepts (Brown et al., 2000, p. 279). Successful technologies are more likely to be adopted which then promotes growth. As Mayer-Schönenberger and Hurley (2000, p. 147) put it, global communication networks promote international trade and economic integration, as they lower cross-border transaction costs. Marketing information can be accessed by customers world-wide and this implies a decline in the importance of geographic proximity. Given a certain level of information about economic policies in other countries, cultural proximity could reduce resistance against those ideas. For example, structural reforms conducted by many industrial countries in the eighties spread only slowly to developing nations. Only with increased proximity did LDCs follow suit. It could also be that the adoption of Western technologies would not lead to higher growth rates if the social and cultural environment in which they are embedded were not also adopted (Saich, 2000, p. 211).

As can be seen in column 1, social integration significantly promotes growth, at the one per cent level of significance. When included separately, all three sub-indices also significantly promote growth, at least at the five per cent level. When estimated with GMM, the overall index of social integration does not influence growth (column 5). The former result may arise from reverse causality. Note, however, that the Sargan test does reject the exogeneity of the instruments. We therefore treated the rate of inflation and government consumption as predetermined instead of strictly exogenous. As column 2 shows, economic growth rises with social integration with a coefficient significant at the ten per cent level. Regarding personal contact and cultural integration, the OLS results are confirmed by the GMM regressions. Information flows, however, do not significantly affect growth when estimated with GMM; this remains true when inflation and government consumption are treated as predetermined variables.

Table 4.15 Political dimension of globalisation and economic growth (1970–2004)

	(1) GDP p.c. growth	(2) Log (GDP p.c.), end of period	(3) ^a
Index of political globalisation	0.011 (0.54)	0.005 (0.81)	0.006 (1.75)*
Log (GDP p.c.), beginning of period	-4.465 (4.99)***	0.714 (2.60)**	0.679 (7.21)***
Secondary school enrolment	0.030 (2.23)**	0.000 (0.16)	0.001 (0.52)
Rule of law	0.316 (1.87)*	0.014 (0.88)	0.019 (1.34)
Log (life expectancy)	-0.650 (0.21)	0.102 (0.23)	0.165 (0.53)
Log (fertility rate)	-1.754 (1.75)*	0.053 (0.47)	0.075 (0.85)
Investment (percentage of GDP)	0.182 (5.16)***	0.007 (1.31)	0.005 (1.37)
Government consumption (percentage of GDP)	-0.144 (2.11)**	0.000 (0.09)	-0.006 (1.35)
Inflation rate	-0.079 (1.71)*	0.001 (0.55)	0.001 (1.09)
Estimation method	OLS	GMM	GMM
Number of countries	113	99	99
Number of observations	406	250	250
R ²	0.70		
Sargan test (p-level)		0.03	0.11
Arellano-Bond test (p-level)		0.85	0.86

Robust t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

^a Government consumption and inflation treated as pre-determined.

Finally, Table 4.15 reports results for political integration. Political integration could feasibly influence growth rates. Economic globalisation leads to the inability of national governments to control their citizens (Allison, 2000, p. 83). On one hand, greater political integration could serve governments as a counter-weight to globalised markets. They could cooperate to promote more redistribution than would otherwise be possible. This could reduce economic growth. A good example may be pre-Industrial Revolution Europe. Low political integration and the resulting competition between governments strongly promoted economic and technical innovations (Rosenberg and Birdzell, 1986, p. 137; Jones, 1981, p. 138). On the other hand, greater integration could lead to reforms in political or economic processes and thus promote growth. Examples may be monopoly regulation in the European Union or free trade zones like the North American Free Trade Area (NAFTA) and Mercado Común del Sur (MERCOSUR). As columns 1 and 2 show, however, political integration is statistically irrelevant for economic growth. Again, however, the Sargan test is ambiguous, so we also present estimates with inflation and government consumption treated as predetermined variables. As shown in column 3, political integration increases growth at the ten per cent level of significance.

To summarise, in addition to the overall Index of Globalisation, several dimensions have a significant (positive) influence on growth: capital and trade restrictions in developed countries, social integration, personal contact, cultural integration and – depending on the method of estimation – political integration.

Robustness Analysis: We test for the robustness of the results for the overall index, capital and trade restrictions in developed countries, social integration, personal contact, cultural integration and political integration. First, we check for the influence of outliers using an algorithm that is robust to their presence. The robust regression technique weights observations in an iterative process. Starting with OLS, estimates are obtained through weighted least squares where observations with relatively large residuals receive smaller weights. This procedure results in estimates not being overly influenced by specific observations.

Secondly, we replicate all regressions (estimated with OLS and GMM) omitting – one at a time – the following sub-groups: East Asian countries, Latin American countries, Sub-Saharan-African countries, OECD countries and, finally, India and China. Thirdly, we include additional variables which could influence the relationship between the indices and growth: the black market premium, overall budget balance, political instability, industrial wage inequality as well as the variables of banking quality and institutional variables introduced above.

To measure political instability, we construct an index employing the following variables: assassinations, strikes, guerrilla warfare, financial crises, riots, coups and revolutions. Since these variables are highly collinear, they can not all be included separately in one regression. Therefore, an overall indicator is constructed, again using principal components analysis.⁵⁹

⁵⁹ The weights obtained are 0.08 (assassinations), 0.1 (strikes), 0.25 (guerrilla warfare), 0.15 (crises), 0.16 (riots) and 0.27 (revolutions).

Table 4.16 Globalisation and economic growth, tests for robustness (1970–2004)

	KOF index		Restrictions, high income countries		Social globalisation	
	OLS	GMM	OLS	GMM	OLS	GMM
Robust regression	1		1		1	
Without East Asian countries	5	5	1	5	1	5
Without Latin American countries	1	5	5	10	1	10
Without Sub-Saharan Africa	10	insig.	5	insig.	1	insig.
Without OECD countries	5	5			10	insig.
Without China an India	1	10	1	insig.	1	10
Overall budget balance	10	insig.	insig.	insig.	insig.	insig.
Political instability	5	5	1	10	1	10
Inequality	insig.	insig.	1	insig.	5	insig.
Banking quality	10	insig.	1	insig.	insig.	insig.
Institutional variables	1	10	1	insig.	1	insig.

	Personal contact		Cultural globalisation		Political globalisation	
	OLS	GMM	OLS	OLS	GMM	OLS
Robust regression	1		insig.	1		insig.
Without East Asian countries	1	5	5	1	5	5
Without Latin American countries	5	5	1	5	5	1
Without Sub-Saharan Africa	5	insig.	10	5	insig.	10
Without OECD countries	5	insig.	10	5	insig.	10
Without China an India	1	5	5	1	5	5
Overall budget balance	5	10	insig.	5	10	insig.
Political instability	5	5	10	5	5	10
Inequality	10	insig.	insig.	10	insig.	insig.
Banking quality	insig.	insig.	insig.	insig.	insig.	insig.
Institutional variables	1	10	5	1	10	5

Note: Numbers indicate the level of significance of the KOF indices in the growth regression when the respective region is excluded from or variable is included to the growth regression.

Table 4.16 shows the results of the stability analysis. The overall Index of Globalisation is not completely robust to the inclusion of further variables in the GMM regressions. In most cases, however, the coefficients do not become insignificant because of the inclusion of the variables, but due to the drastically reduced number of observations. For example, including the variables of banking quality reduces the number of observations to 147 (when estimated with GMM). The coefficients remain insignificant when the sample is restricted to those countries where the additional variables are available even if the variables are not included in the regression. Table 4.16 also shows that the results are not driven by outlying observations.

The absence of restrictions in high income countries is not robust to the exclusion of particular countries or the inclusion of additional variables (according to the GMM estimates). Excluding sub-Saharan African countries, for example, renders the coefficient insignificant. The same is true when we control for the impact of the budget balance, inequality, banking quality and institutional variables. Note that we do not exclude OECD countries since this would leave us with an insufficient number of high income countries.

As can be seen in the Table 4.16, the GMM results for social integration and its sub-dimensions – personal contacts and cultural integration – are also not robustly related to economic growth. Political integration significantly affects growth in only one of the additional regressions.

Summary: Contrary to the beliefs of its critics, there is some evidence that globalisation does promote economic growth. The overall KOF globalisation index is highly significant in most specifications and has been shown to be quite robust to the inclusion of potentially relevant covariates in the regression as well as different estimation methods. The effects are economically relevant.

On average, countries that were more globalised experienced higher growth rates. This is especially true for social integration and – in developed countries – the absence of restrictions on trade and capital. Clearly, the significance of the measures of globalisation partly depends on the sample of countries analysed. Still, the argument that poverty persists because of globalisation is a suspect one. On the contrary, the countries with the lowest growth rates are those that did not globalise. Countries like Rwanda or Zimbabwe, e.g., insulated themselves from the world economy. They have poor institutions that repress growth and promote poverty.

4.4 Globalisation and deunionisation

One of the striking economic features of the 1980s and early 1990s in many developed economies was the deterioration in the relative labour market outcomes for unskilled workers. Symptomatic of the deterioration was the increasing skilled wage premium. With the focus of academic and social concern turning to the welfare of the unskilled, institutional changes in developed country labour markets, such as deunionisation, the decentralisation of collective bargaining and labour market deregulation, have understandably attracted considerable attention. Since the early 1980s, union membership has been declining in many OECD countries; in some cases the declines have been precipitous. The last two decades of the last millennium were relatively poor ones for unskilled workers and the link to deunionisation seems obvious.⁶⁰

Changes in the relative demand for labour, reflected by the changing composition of product demand (brought about, e.g., by falling trade barriers) and changes in the factor-mix driven by skill-biased technical change have been the most popular explanations for the deteriorating labour market outcomes for unskilled workers. In particular, increasing integration is likely to lead to both greater product market and labour market competition. International trade, the multinationalisation of production and international migration have been the subject of an enormous economics literature attempting to link globalisation with the poor labour market outcomes for unskilled workers. Some of this research also finds that union workers have been the most vulnerable to global forces (e.g., Gaston and Trefler, 1995). Four channels through which this vulnerability is exposed are as follows. First, international competition reduces the economic rents for employers and workers to negotiate over. Secondly, the increasing mobility of capital shifts the threat points in the bargaining game over the dwindling economic rents. Thirdly, globalisation may encourage governments or unions to adopt policies that weaken union bargaining strength (Gaston, 2002; Scruggs and Lange, 2002). Finally, unionisation may be adversely affected by social integration, i.e., the variety of non-economic and non-political factors that seemed to have simultaneously affected many economies. For example, Friedman (1999) and Rosendorf (2000) equate globalisation with “Americanisation”. Consequently, if globalisation implies institutional convergence to some common (U.S.) benchmark, then developed country labour markets are in the process of becoming less unionised and less regulated. The common element linking each of these factors is that they are all consistent with falling union membership.

In this section, we examine whether union membership in OECD countries has been affected by globalisation.⁶¹ In addition to the covariates that are common

⁶⁰ For instance, Blau and Kahn (1996) find that a lot of the difference in wage inequality between the United States and nine other OECD countries can be explained by what they term “union-pay levelling effects”, i.e., unions compress wage distributions.

⁶¹ This section is a substantial revision and update of Dreher and Gaston (2007).

in the literature, we use the KOF Indices that capture the distinct dimensions of globalisation – economic integration, political integration and social integration. In the present application, focussing on the separate dimensions of globalisation seems appropriate given a common finding in recent studies investigating the determinants of deunionisation is that economic globalisation does not seem to have mattered. While this finding may strike many economists as somewhat surprising, we argue that a narrow focus on the effects of trade and investment liberalisation on unions may involve adopting an insufficiently broad perspective on the effects of globalisation on unions.

Deunionisation, globalisation and the labour market: According to Wallerstein and Western (2000), two crucial longitudinal features of union organisation and the centralisation of wage setting are as follows. First, labour market regulation, unionisation and bargaining centralisation in industrialised countries steadily diverged over the three decades from 1950. Second, there was a convergent pattern of decline in union density and centralised wage setting during the 1980s. Falling unionisation was especially severe in the English-speaking countries, where union density fell by 15 points in the United Kingdom, by 12 points in Australia and by 10 points in Ireland and the United States (Wallerstein and Western, 2000, pp. 357–8). They also highlight the fact that most “standard” models of union organisation failed to predict the large declines in unionisation that occurred during the 1980s.

There is now a sizable body of research examining the relationship between the institutional structure of the unionised sector of an economy (i.e., the extent and centralisation of organisation) and various measures of macroeconomic performance. Countries with encompassing labour market institutions (i.e., large unionised sectors with centralised bargaining) are characterised by: lower wage inequality, lower unemployment and higher growth.⁶² The usual explanation involves the ability of centralised bargaining institutions to internalise negative wage externalities (Calmfors, 1993; Garrett, 1998a). That is, where strong sectoral unions pursue wage gains relative to some perceived market wage, resulting in cost-push inflation, reduced employment, lower growth and inter-sectoral inequality, the centralised union recognises these negative externalities and takes them into account in its bargaining. Thus, as unionisation has declined, there is some evidence that wage inequality has increased (Freeman, 1998).

While the search for common factors in the trend of increasing earnings inequality in the last two decades has primarily focussed on the relative demand for less-skilled workers, explanations for cross-national differences in labour market outcomes have increasingly resorted to comparative institutional analysis. In an important paper, DiNardo and Lemieux (1997) conclude that the greater deunionisation of the workforce in the United States relative to Canada can explain much

⁶² On wage inequality see Rowthorn (1992), Zweimüller and Barth (1994) and OECD (1997); on unemployment see OECD (1997); and on growth see Calmfors and Driffill (1988), Rowthorn (1992), Calmfors (1993) and Danthine and Hunt (1994).

of the difference in male earnings inequality between the two countries. Likewise, Fortin and Lemieux (1997) find that deunionisation can explain about a third of the increased earnings inequality for U.S. male workers. These studies contrast with earlier studies that tended to dismiss the role of deunionisation, because in a similar fashion to deindustrialisation, the related process of deunionisation has been an ongoing one.

One of the essential claims in much of the popular writing on globalisation, and surely a major source of the pervasive social concern about globalisation, is its transformative nature. That is, globalisation is taken to transform institutional structures in ways that might be obscured when we apply the standard toolkit of economic theory. For example, increased globalisation may initiate changes to labour market institutions, such as collective bargaining practices, that have historically served to bolster the position of less-skilled workers in the labour market. Bluestone and Harrison (1982, p. 170) argue that “... *large corporations ... can build, expand, or acquire facilities outside the [United States] altogether. In fact, all the strategic innovations devised by multi-plant companies for playing off one group of workers against another ... have become standard operating procedure in the global economy*”.

Lindbeck and Snower (1996) show that in the age of the new global firm, which stresses multi-tasking activities by employees, centralised wage bargaining is inefficient. Efficiency dictates the switch to less-centralised forms of wage bargaining and a greater reliance on individual employment contracts. Greater reliance on market-based contracts and movements away from centralised wage bargaining and union-employer negotiations would by themselves increase the dispersion of labour market earnings.⁶³

Some authors have explicitly linked increased international competition and trade as a reason for a move towards more decentralised wage bargaining. For example, Marginson and Sisson (1988) note that British multinational corporations have been less likely to engage in multi-employer bargaining.⁶⁴ Katz (1993, p. 16) argues that the “... *increasing prevalence of multinational trade and multinational firms may ... help to explain the declines in multi-employer bargaining that have occurred in a number of countries*”. Driffield and Taylor (2000) note, for instance, the insistence by Japanese corporations operating in the United Kingdom on single union deals. Standing (1997, p. 12) argues that international trends towards increased labour market flexibility and deunionisation have been propelled by globalisation. In fact, the “erosion” of labour security has been “*fuelled by the international division of labour*”.

Since countries with similar standards of living and economic development generally have access to labour and capital of similar quality, it is quite likely that

⁶³ Some recent evidence consistent with this line of argument is provided by Haskel, Kersley and Martin (1997) who show that increasing labour market flexibility in the United Kingdom has resulted in labour input being more closely aligned to the business cycle.

⁶⁴ See also Katz (1993) and Ehrenberg (1994).

the magnitude and nature of any technical change will also be similar. In fact, Katz, Loveman and Blanchflower (1995) have argued that this must also be true for any changes on the demand-side, since European Union countries were also affected by import penetration from countries abundant in unskilled labour. Given the similarity in aggregate endowment, technology and shocks, it seems quite natural to investigate the different institutional forces operating in each country to understand cross-country differences in the trends and structure of earnings dispersion. In the United Kingdom and the United States, deunionisation has been a significant labour market development even though bargaining structures are already relatively decentralised in those economies (Layard, Nickell and Jackman, 1994; Katz, 1993). Some authors have argued that these changes are explicitly linked to growing international competition (e.g., Freeman and Gibbons, 1995).

In short, globalisation is widely thought to have affected unions and the way in which workers' wages and employment are negotiated. On the one hand, globalisation is taken to imply increased competition that, even without any change in relative bargaining power, will squeeze sectoral rents and lead to reduced wages in post-globalisation bargains (Abowd and Lemieux, 1993). In a closely related fashion, by raising the elasticity of demand for labour, imports can be seen to directly reduce the market power of unions (e.g., Dumont, Rayp and Willeme, 2006). An alternative argument involves an expectation that firms and capital are globally more mobile than labour (e.g., Mezzetti and Dinopoulos, 1991). The existence of an exit option or threat, even if not exercised, may also change the relative bargaining power of the firm and the union (Gaston, 2002). Each of these forces would likely lower the benefits of union membership for workers.

In view of the rather strong theoretical presumption that globalisation has adversely affected unions, it is then somewhat surprising that recent empirical studies find so little evidence to support this. At the outset it should be noted that some authors argue that there is no crisis in contemporary trade unionism (Gaston, 2002). For instance, despite falling union membership in a number of countries, the majority of workers in Western Europe are still covered by collective bargaining agreements (Wallerstein and Western, 2000). Moreover, there are few common trends in contemporary trade unionism and no sustained decline of organised labour or the decentralisation of collective bargaining underway across all countries. More pointedly, Golden and Londregan (1998) and Golden (2000) find little or no evidence that increasing trade and financial openness is bad for labour or that it has had significant adverse effects on union organisation and membership.⁶⁵

Has globalisation affected unionisation? In this section we focus on whether the decline of union density can be explained by global factors. We estimate combined cross-section time-series regressions to analyse whether the various ele-

⁶⁵ Scruggs and Lange (2002) also find insignificant effects of economic globalisation on union membership trends. In addition, Wallerstein and Golden (1997) argue that while there is no general decentralisation of wage setting underway in the four Nordic countries, Swedish decentralisation is largely the result of a deliberate, politically-motivated attack on the political power of organised labour.

ments of globalisation have affected unionisation. Again, globalisation is measured employing the KOF Indices. We use panel data for 17 OECD countries and 20 years, 1980–1999. The data are averaged over five years. One advantage of employing averaged data is that it allows us to focus on medium-term changes, so that our results are not driven by cyclical fluctuations in union membership. The obvious disadvantage is that we have to base our conclusions on only 58 observations. We found significant fixed country effects in all specifications. Again, standard errors are estimated robustly. All variables, their precise definitions and data sources, are listed in the Appendix.

Our model takes the following form:

$$DU_{i,t} = \alpha + \beta G_{i,t} + \gamma' X_{i,t} + \eta_i + \varepsilon_{i,t} \quad (4.4)$$

where i indexes countries and t time, DU is the change in union density, G represents the measure of globalisation, X is a vector of exogenous variables, η_i is a country fixed effect and ε is a normally distributed random disturbance.

Apart from the Index of Globalisation, the explanatory variables capture the effects of left-leaning parties in government, population density, the percentage of the workforce in industrial employment, inflation and the unemployment rate. All variables are measured as averages over the respective five-year-period. Wallerstein and Western (2000) argue that a strong economy should bolster union membership. Accordingly, higher inflation and low unemployment should be associated with higher union density. The percentage of workers in industry is intended to capture the underlying process of deindustrialisation. Left-wing governments are commonly thought to favour union rights and a legislative environment more supportive of unions. Population density is included to capture the costs of union organisation. We also include two dummies, Ghent and Anglo. The Ghent dummy equals one for the four high union density countries in which unions play an active role in the administration of (publicly-financed) unemployment benefits. A standard argument is that the Ghent system enables unions to shelter their members from the effects of labour market competition (Wallerstein and Western, 2000). The Anglo dummy equals one for Anglo-Saxon countries. In contemporary times at least, Anglo-Saxon countries generally have more flexible labour markets and wage systems and have experienced greater growth in wage inequality (e.g., Cahuc and Zylberberg, 2004). The dummy variable is also included in order to capture any of the “Americanisation” influences mentioned above, which are likely to be stronger for English-speaking countries.⁶⁶

⁶⁶ As in Peetz (1998), for instance.

Table 4.17 Globalisation and deunionisation (OLS, 1970–2004)

	(1)	(2)	(3)	(4)	(5)
KOF Index of Globalisation	-0.023 (1.89)*				
Index of economic globalisation		-0.011 (0.72)	-0.019 (1.83)*		
Index of social globalisation		-0.011 (0.86)		-0.016 (1.93)*	
Index of political globalisation		0.003 (0.28)			-0.001 (0.13)
Population density	-0.001 (1.44)	-0.001 (1.38)	-0.001 (1.38)	-0.001 (1.76)*	-0.002 (1.85)*
Government left-wing	-0.346 (1.28)	-0.404 (1.41)	-0.445 (1.68)*	-0.341 (1.26)	-0.465 (1.64)
Unemployment	-0.016 (0.58)	-0.025 (0.74)	-0.011 (0.38)	-0.028 (0.96)	-0.017 (0.58)
Inflation rate	0.972 (1.70)*	0.821 (1.35)	0.960 (1.68)*	0.853 (1.49)	0.994 (1.65)*
Industrial employment to total labour	-0.075 (2.84)***	-0.082 (2.75)***	-0.077 (2.80)***	-0.076 (2.85)***	-0.058 (2.24)**
Ghent, dummy	0.586 (2.64)***	0.579 (2.25)**	0.598 (2.60)***	0.540 (2.49)**	0.497 (2.18)**
Anglo, dummy	-0.813 (3.02)***	-0.742 (2.44)**	-0.782 (2.82)***	-0.788 (2.91)***	-0.882 (3.14)***
Trend	0.162 (1.45)	0.159 (1.36)	0.148 (1.36)	0.144 (1.36)	0.053 (0.52)
Number of countries	17	17	17	17	17
Number of observations	58	58	58	58	58
Normality (prob>chi ²) ^a	0.87	0.96	0.87	0.95	0.65
R ²	0.49	0.5	0.49	0.49	0.45

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

^a Skewness/kurtosis test for normality of residuals. The null hypothesis is that there is no difference in the cumulative distribution of the residuals compared to the theoretical normal distribution.

The results appear in Table 4.17. Column 1 includes the overall Index of Globalisation. First, the rate of inflation and unionisation are positively correlated. A higher share of industrial employment in total employment reduces deunionisation, at the one per cent level of significance. The dummy for Ghent countries is significant at the one per cent level, with a positive coefficient. This suggests that the Ghent countries not only have higher levels of unionisation, but have also been the most successful in resisting the forces driving the process of deunionisation. The large and significant negative coefficient for Anglo-Saxon countries captures the very sharp declines in unionisation in those countries. Quantitatively, being a Ghent country increases unionisation by 0.59 percentage points, while unionisation is 0.81 percentage points lower in Anglo-Saxon countries. The fact that the size and significance of the coefficient for social integration did not become significantly smaller suggests that the effects of social integration on unions are not attributable to a simple Americanisation story. Population density, governments' political leaning and unemployment do not significantly affect unions. Note that the trend term is also not significant at the one per cent level.

Regarding the variable of main interest, globalisation, column 1 shows a negative coefficient, at the ten per cent level of significance. This implies that globalisation seems to indeed reduce unionisation.

Column 2 employs the disaggregated globalisation indices and columns 3–5 include each sub-index separately. The results for the covariates are fairly similar across the various specifications, both qualitatively and quantitatively. In no specification does the unemployment rate significantly affect unionisation. The same is true for the trend term. The dummy for left-wing governments enters significantly in one specification, with a coefficient significant at the ten per cent level. According to this specification, union density is about 0.45 percentage points lower in countries with left-wing governments. Population density affects unionisation negatively in two specifications, at the ten per cent level of significance.

Most importantly, the results of Table 4.17 show that globalisation indeed affects unionisation. While the three sub-indices are not significant at conventional levels when included jointly to the regression, the disaggregated analysis shows that unionisation significantly decreases with rising economic and social globalisation when included individually. This is in line with the hypothesis that unionisation has been adversely affected by globalisation. The magnitude of the coefficients is quantitatively relevant as well. An increase in the index of economic (social) globalisation by one point reduces unionisation by 0.019 (0.016) percentage points. Given that the average five-period-change for union density across the sample is -0.26 and that the average economic (social) globalisation index is 50 (37), this represents a substantial impact.

In summary, economic globalisation and social globalisation are important determinants of deunionisation. However, the estimated coefficient for political integration is insignificant, when included individually and when employed at the same time with the other sub-indices.

Recall that the social globalisation index is intended to measure the spread of ideas, information, images and people. Boockmann and Dreher (2003) argue that the means of information and communication are important since they relay information about economic performance in other countries. Exposure to such information may promote the acceptance of new concepts, policies and institutions (Brown et al., 2000). Successful technologies and institutions are adopted which promote competitiveness and better economic performance. Mayer-Schöenberger and Hurley (2000) argue that global communication networks promote international trade and economic integration because they lower cross-border transaction costs. In part, this speaks to the difficulty in completely distinguishing between economic and social integration. Marketing information can be accessed by customers worldwide, which implies a decline in the importance of geographic proximity. Given an increasing amount of information about economic policies in other countries, cultural proximity could reduce resistance against those ideas.

Deunionisation is associated with social integration. As noted, for some commentators social integration is synonymous with “Americanisation”. Hence, social integration may imply that the labour market institutions of non-U.S. developed countries are converging to their non-unionised, deregulated U.S. counterpart. This is particularly the case for the management and labour relations practices in the other Anglo-Saxon countries (Peetz, 1998).

Other, possibly more tangible, factors associated with the effects of social integration on labour market institutions are mentioned by Ebbinghaus (2002; 2003). First, longer-term socio-economic changes, associated with deindustrialisation and the growth of the atypical and part-time work forces, as well as the growing normative orientation towards individualism rather than collectivism make collective organisation more difficult (Ebbinghaus, 2002). Secondly, the recent wave of immigration, particularly from non-EU countries to Western Europe, changes the composition of the supply of potential union members. Many of these immigrants came from countries where workers do not have the same propensity to unionise and/or migrated to countries where racism and xenophobia among native union workers make unionisation unattractive (Ebbinghaus, 2003). Further, given that many immigrants are, on average, younger than native workers in host countries, and to the extent that the young tend to view unions as old-fashioned and anachronistic institutions, mitigates against the growth of union membership (Ebbinghaus, 2002).

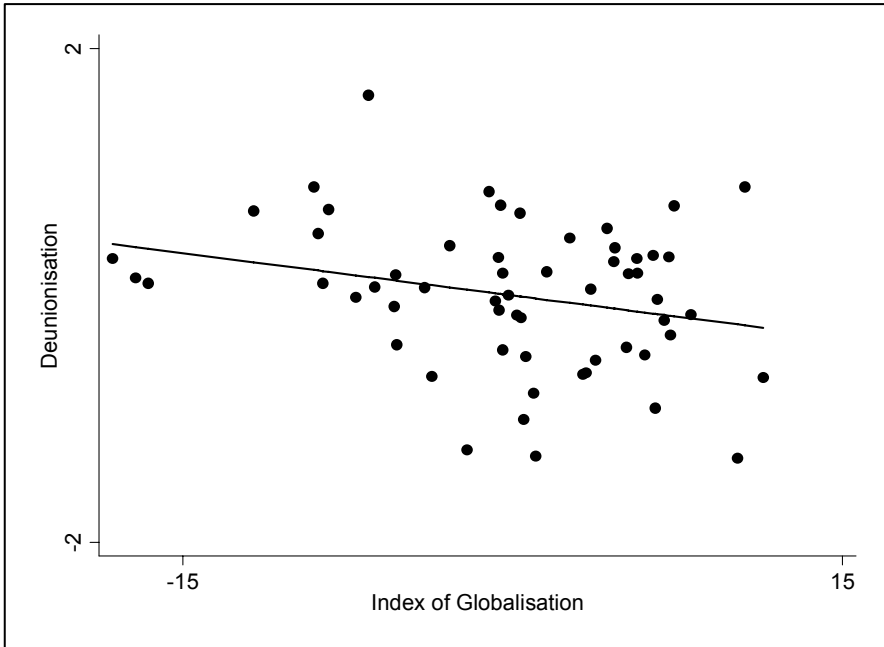


Figure 4.2 Globalisation and deunionisation (1970–2004, OLS)

Finally, we provide some tests for the robustness of the results (not reported in tables). First, to examine the sensitivity of the results to influential observations, we checked for the influence of outliers using robust regression. The estimates indicate that the results are not driven by outliers, i.e., the impact of the Index of Globalisation remains significant and the same is true for economic and social globalisation. Figure 4.2 further illustrates the relationship between the change in unionisation and globalisation. The Figure depicts the partial leverage plot that shows the correlation of the change in unionisation and the globalisation index once the impact of the other independent variables has been controlled for. The Figure also indicates that the reported results above are not driven by any influential observations.

Concluding Comments: One of the striking economic facts of the 1980s and early 1990s in many developed economies was the deterioration in the relative labour market outcomes for unskilled labour. Over the same period, it has been argued, these same countries experienced an increase in a number of components of something widely called “globalisation”. Globalisation has accelerated in recent decades, as evidenced by, among other things, the growth in the trade of goods and services and the growth in foreign direct investment. The driving forces seem to be the decline in administrative barriers to trade, sharp falls in the costs of transportation and communication and the fragmentation of production processes.

From an academic perspective, the labour market developments have stimulated research on a broad range of policy-related issues: from trade, macroeconomic and labour market policy coordination through to the internationalisation of non-border measures. The essential empirical issue is macroeconomic: accounting for the economy-wide rise of the skill-premium at a time when the share of skilled to unskilled workers is rising. The interpretation of the empirical results, as well as the appropriate implementation of the framework, is not without controversy. But the aggregate professional prior would seem to have settled on the conclusion that international trade has a small effect on the skill-premium. Rather other factors, such as skill-biased technological change, are more important. The analysis of the effects of immigration on the skill premium has generally produced even smaller empirical estimates.

With a strong suspicion that globalisation still “matters”, some commentators have argued that it is useful to consider the possibility that the widespread concern with globalisation emerges as a result of changes that are, to some extent, obscured when we apply standard labour- or trade-theoretic methods to it. In particular, the indirect effects of globalisation raise the possibility that institutions, which have compressed wages in the past, have been eroded or altered by the various elements of globalisation (Gaston and Nelson, 2004). A prominent example is the possibility that deunionisation is to some extent explained by globalisation. Given the traditional role that unions have played in supporting the wages of less- and semi-skilled workers, the erosion of union bargaining power would lead to a widening in the skilled wage premium that would superficially appear to be unrelated to the direct effects of globalisation.

Since the early 1980s, union membership in most OECD economies has fallen. The process of deunionisation roughly coincides with the rapid globalisation of the very same economies. It has been common practice to associate these developments. Somewhat surprisingly, previous studies have failed to find a systematic link between measures of union strength and the usual measures of economic openness. We revisited the issue of whether the decline of union density can be explained by global factors. In addition to the covariates that are commonly used in the literature, our analysis employed the KOF Index of Globalisation and its different components as independent variables.

It was found that economic and social integration has been important for unionisation. Specifically, the economic and social dimensions of globalisation have adversely affected union membership. Social integration is concerned with the spread of ideas, information, images and people. Some authors have argued that social integration implies an Americanisation of institutions and policies. Regardless of whether this is considered to be a race-to-the-top or a race-to-the-bottom, the implication for many developed countries is that their labour markets are now less unionised with wage bargaining occurring at increasingly decentralised levels.

4.5 Globalisation and inequality

The rapidly growing literature on the personal distribution of income and labour earnings bears testimony to the renewed interest by social commentators and economists on an important issue.⁶⁷ The interest has been stimulated by the growth of income inequality in many countries during the last two decades of the last century. Another possible cause for the renewed interest may be the failure by researchers to find firm statistical evidence that changes in income inequality are driven by a deterministic Kuznets-curve process.⁶⁸ Consequently, the issue of which are the more important driving forces for changes in within-country income distributions is still open.

From a purely economic perspective, increases in earnings inequality could be viewed as being the result of the normal and healthy functioning of a market economy (e.g., Welch, 1999). However, social and political concern about the increased dispersion in the personal distribution of income, which is closely allied to increased earnings inequality, is quite pervasive. For instance, a higher incidence of low-paid jobs is usually associated with greater earnings inequality (OECD, 1996). In addition, for some countries the increases in inequality have been so dramatic so as to demand the increased attention by researchers.

Coincident with the severe deterioration in the relative, and real, return to unskilled labour in the 1980s and early 1990s, in virtually all developed countries, was the fact that these same countries experienced an increase in a number of components of something widely called “globalisation”. This has resulted, since the late-1980s, in an explosion of theoretical and empirical efforts to evaluate the link between globalisation and labour market outcomes, often along with evaluation of alternative explanations. Somewhat surprisingly there are a small number of econometric studies that have focussed on the core issue of whether globalisation has significantly affected income inequality in the majority of countries – both developed and developing. Moreover, the existing studies focus on various aspects of economic globalisation, i.e., flows of trade, foreign direct investment or restrictions on the capital account. However, as has been argued throughout this monograph, globalisation also has important social and political dimensions.

Although largely neglected in the economics literature, both political integration and social integration are likely to be important for inequality. For example, in the absence of restrictions on capital mobility, a country is more likely to competitively lower taxes or offer subsidies to attract investment the closer is a poten-

⁶⁷ See Atkinson (1997). For an excellent survey see Brune and Garrett (2005). See Bhagwati and Srinivasan (2002) for a discussion of how trade affects poverty in poor countries.

⁶⁸ See Deininger and Squire (1998). Lindert (2000, p. 173) argues that “[i]f the Kuznets curve has to some extent tyrannised the literature on inequality trends. Energies that could have moved earlier into exploring the underlying causes of inequality were diverted into a debate over whether or not there was an inverted U curve, either in history or in post-war international cross-sections”.

tial host country's culture to that of a source country and the easier it is to exchange information. Lower taxes may also lower social standards and this is one channel through which the social dimension of globalisation may be important for income inequality. On the other hand, political integration may ameliorate a potential "race to the bottom" induced by economic globalisation. Hence, while economic globalisation may increase inequality, political globalisation could actually serve to reduce it.

The objective in this section is to use the globalisation indices to gauge the effect on both income and earnings inequality. To measure inequality we use the UTIP-UNIDO measures of industrial wage and household income inequality.⁶⁹

The Literature on Globalisation and Inequality: The impact of globalisation on labour market outcomes and income inequality in developed countries has been a particularly fertile ground for research during a time when international trade liberalisation has progressed and concerns about rising imports from low-skill abundant LDCs have been prominent. Some authors, using a variety of methodologies, have found significant labour market effects attributable to increasing import penetration.⁷⁰ This seems to confirm the prediction of the standard trade model that increased trade will worsen the distribution of earnings in developed countries and have the opposite effect on LDCs.⁷¹ On the other hand, as far as FDI is concerned, some authors argue that FDI has increased the relative demand for skilled workers in both developed and developing countries (Feenstra and Hanson, 1996, 1997; Gaston and Nelson, 2002). Due to outsourcing, developed countries reduce their demand for less-skilled workers; however, the demand for skilled labour in LDCs increases because the outsourced activities are relatively skilled from an LDC perspective.

While the search for common factors behind increasing inequality has focussed on economic factors, explanations for cross-national differences are increasingly resorting to stories that emphasise institutional differences across countries. For instance, lower rates of unionisation and collective bargaining tend to be associated with a higher incidence of low-paid employment and greater earnings inequality (e.g., Blau and Kahn, 1996). In fact, as discussed in the previous section, the increases in inequality in recent years have coincided with more decentralised wage bargaining and deunionisation.

The importance of institutional factors highlights the need to have a sufficiently broad measure of globalisation when investigating its effects on income

⁶⁹ This section is a substantial revision and update of Dreher and Gaston (2008).

⁷⁰ See Wood (1994), for instance. The great majority of empirical research on this issue has focussed on developed countries. Possibly as a result of data limitations, there are very few studies of developing countries. However, the studies that have been done seem to indicate that increased openness has coincided with increases, and not decreases, in inequality. See Kanbur (2000) and Attanasio et al. (2004). One argument is that imported technology has raised the relative demand for highly skilled labour in LDCs, see Arbache, Dickerson and Green (2004), e.g.

⁷¹ Slaughter (2000) surveys the empirical research based explicitly on the Stolper-Samuelson theorem.

inequality. Trade liberalisation is often bundled with privatisation and deregulation measures as well as changes in social policies (e.g., Lindert and Williamson, 2001). In addition to economic factors and changes in labour market institutions, Anthony Atkinson argues that changes in *social* norms are important. Overall, inequality may be adversely affected by the social forces that seem to have simultaneously affected so many economies.⁷²

There are two competing perspectives on the relationship between the welfare state, politics and globalisation. The first is that globalisation places considerable stress on the welfare state, so that some social and labour market policies will display tendencies of a “race to the bottom”. For instance, Tanzi argues that increased mobility of capital not only erodes the tax base, reducing the welfare state’s ability to fund its programmes, but by shifting taxes onto labour, the capacity of the State to redistribute is reduced (Tanzi, 1995). Blank and Freeman argue that some European countries, in the face of increased international competition, tried to reduce the “generosity” of their social programmes (Blank and Freeman, 1994; Gaston and Nelson, 2004). Arguments such as these imply that globalisation worsens inequality.

An opposing view is that social policies respond in ways that minimise any adverse consequences of globalisation for vulnerable workers. It has been observed that the classic, large welfare states developed in the context of considerably more open economies than did the smaller, market conforming welfare states (Huber and Stephens, 1998). A plausible story is that changes to cash transfer and income tax systems have arisen to ensure acquiescence by the potential losers from globalisation.⁷³ In addition, it has been argued that heterogeneity of domestic political, as well as labour market, institutions support heterogeneous responses to globalisation.⁷⁴

A summary of the testable hypotheses appears in Table 4.18. Obviously, the plethora of theoretical models has generated conflicting predictions about the effects of globalisation on income inequality. The lack of unambiguous predictions (indicated by “+/-”) and question marks in the table highlight, at the very least, the need to add to the empirical knowledge of the facts. We turn next to this task.

⁷² See Atkinson (1997). For example, Friedman (1999) equates globalisation to “Americanisation”. Hence, globalisation may imply that many labour markets are in the process of becoming less unionised and less regulated, as discussed in section 4.4.

⁷³ See Rodrik (1998b). Interestingly, Bordo, Eichengreen and Irwin (1999) carry this argument further, suggesting that the presence of sizable welfare states may have played an important role in providing sufficient indifference to globalisation, that policies like support for the GATT/WTO system and the Bretton Woods institutions continued even in the face of recessions that might have had system-closing consequences in earlier eras.

⁷⁴ See Garrett (1998) and Swank (2002).

Table 4.18 Predicted effects of globalisation on inequality

Dimension of globalisation	OECD	LDCs	All
Economic	+	+/-	?
Political	+/0/-	+/-	?
Social	+	?	?
Overall	+?	?	?

Key: Theory predicts: +/0/-/? = positive/zero/negative/unknown effect.

Data and Method: We estimate combined cross-section time-series regressions using two inequality measures as dependent variables. First, we employ industrial pay inequality, which is publicly available from the University of Texas Inequality Project (UTIP). It is based on manufacturing wage information compiled by the United Nations Industrial Development Organisation (UNIDO) and is available for 156 countries.⁷⁵ The second measure is for estimated household income inequality data, which is also publicly-available from UTIP. These latter data are derived econometrically from a regression of industrial wage inequality and other controls on Deininger and Squire's measure of income inequality.⁷⁶ Apart from the income measure being household- rather than person-based, the main difference between income and earnings is that the former includes the receipt of income from all sources, including capital ownership and government transfers. While changes in earnings inequality and income inequality are highly correlated, much of the theory is couched in terms of one or the other. The literature on the effects of economic integration focusses on the inequality of labour earnings and the impact on the skilled wage premium. In contrast, social and political integration are more likely to affect income, e.g., through their effects on social policies.

All data are averages over five years and cover the period 1970–2000. Since some of the data are not available for all countries or for all periods, the panel is unbalanced and the number of observations depends on the choice of explanatory variables. There are significant fixed country and time effects in almost all estimated model specifications. All standard errors are estimated robustly. All variables, their precise definitions and data sources, are listed in the Appendix.

⁷⁵ The wage data are from either national statistical sources or the OECD and are adjusted to facilitate international comparability.

⁷⁶ See Deininger and Squire (1998). Galbraith and Kum (2004) provide complete details of the data construction. Galbraith (1998) shows that inequality – measured by either pay or by income – has risen in what he terms the age of liberalisation (loosely defined as the 1980s onwards). Details about the evolution of the measures of inequality (as well as the actual data) can be found at the UTIP web-site: <http://utip.gov.utexas.edu/data.html> (accessed June 20, 2007).

For each inequality variable the equation to be estimated is

$$y_{it} = \alpha + \beta y_{it-1} + \gamma' G_{it-1} + \delta' X_{it} + \eta_i + \eta_t + \varepsilon_{it}, \quad (4.5)$$

where y represents the natural logarithm of one of two different inequality measures, G represents the (lagged) measure of globalisation, X is a vector of control variables, η_i is a country fixed effect, η_t is a period fixed effect and ε_{it} is a random disturbance.

The lagged dependent variable is included because inequality tends to change slowly over time. Since the OLS estimator is biased and inconsistent, in the presence of fixed country effects, we again use the system GMM estimator.⁷⁷

In choosing the set of control variables, we follow standard practice as much as possible. First, we include per capita GDP and its square to capture the possible presence of a Kuznets-curve effect. Simon Kuznets (1955) argued that inequality rises in the early stages of industrialisation, but eventually declines after some level of income is reached. This is the so-called “inverted-U” hypothesis. We also include the Polity IV index of democracy in the baseline model. The political science literature advances the idea that democracy promotes egalitarianism, due to its use of redistributive and welfare state policies. For example, Reuveny and Li argue that democratic governments are more inclined to help the lower and middle classes with progressive taxation, minimum wage laws, price subsidies and public works provision (Reuveny and Li, 2003, p. 577). Hence, countries with more democratic governments are expected to have more equitable income distributions.

Table 4.19 Globalisation and inequality (1970–2000, OLS)

	Wage All	Income All	Wage OECD	Income OECD	Wage Non-OECD	Income Non-OECD
KOF Index of Globalisation	0.016 (1.90)*	0.002 (2.15)**	0.006 (0.49)	0.000 (0.09)	0.010 (0.86)	0.001 (0.44)
Democracy, index	0.032 (2.37)**	0.004 (1.86)*	0.040 (1.34)	0.006 (1.39)	0.027 (1.87)*	0.003 (1.41)

⁷⁷ This also accounts for the potential endogeneity of globalisation, e.g., inequality may induce policy-makers to pursue more inward-oriented policies. Anticipating the result, the Sargan test reported below indicates that endogeneity is not an issue.

Table 4.19 (continued)

	Wage All	Income All	Wage OECD	Income OECD	Wage Non-OECD	Income Non-OECD
GDP per capita	-8.95E-05 (2.27)**	-1.14E-05 (2.16)**	-6.91E-05 (0.90)	-8.87E-06 (1.16)	-8.20E-05 (1.86)*	-1.21E-05 (1.96)*
GDP per capita (squared)	1.00E-09 (1.37)	1.96E-10 (1.39)	1.00E-09 (0.53)	5.39E-11 (0.33)	1.00E-09 (0.54)	1.23E-10 (0.78)
Lagged dependent variable	0.28 (2.99)***	0.46 (5.91)***	0.56 (3.34)***	0.73 (7.87)***	0.27 (2.71)***	0.38 (4.28)***
Number of countries	100	99	27	26	73	73
Number of observations	380	379	119	118	261	261
Period dummies (Prob > F)	0.00	0.02	0.06	0.04	0.00	0.00
Country dummies (Prob > F)	0.00	0.00	0.00	0.00	0.00	0.00
R squared (within)	0.41	0.51	0.61	0.77	0.39	0.42

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Results: Table 4.19 reports results for the baseline model. The lagged dependent variable is significantly different from zero at least at the five per cent level in all specifications. In the full sample, (wage and income) inequality rises with greater democracy and lower GDP per capita. The coefficients of these covariates are all significant at the ten per cent level at least, while the square of per capita GDP does not significantly affect inequality. Neither the result for democracy, nor those for GDP match our a priori expectations. The results support Peter Lindert's lament about the failure (and possible futility) of verifying the presence of a Kuznets-curve effect, i.e., the "inverted-U" hypothesis, which argues that inequality rises in the early stages of industrialisation and declines in later stages, receives no support. The negative influence of democracy, on the other hand, is more difficult to explain, in part because it conflicts with previous findings in the political science literature (e.g., Reuveny and Li, 2003). It seems that having more democratic governments does not necessarily lead to greater redistribution, but rather to more market-oriented policies.⁷⁸

The results show that industrial wage and household income inequality rise with globalisation, with a coefficient being significant at the ten per cent level at least. This seems to confirm the doubts about the supposed benefits of globalisation held by workers in import-competing and globally vulnerable industries in

⁷⁸ In fact, this is what Evans (1997) and Krugman (1999) argue, i.e., an increase in democracy is significantly associated with market-oriented reforms.

developed economies. The globalisation coefficients in columns 1 and 2 of Table 4.19 indicate that a ten-point increase in the globalisation index increases industrial wage inequality by 16 per cent and household income inequality by two per cent.⁷⁹

The last four columns of Table 4.19 report results for OECD and non-OECD countries separately. The smaller sample size implies a reduction in the number of statistically significant coefficients. Democracy still increases wage inequality in non-OECD countries, but is insignificant in the other three regressions. The impact of per capita GDP prevails only for non-OECD countries. Globalisation has no significant impact on inequality in any of the sub-samples (which in contrary to Dreher and Gaston 2007).

Table 4.20 Globalisation and inequality (1970–2000, GMM)

	Wage All	Income All	Wage OECD	Income OECD	Wage Non-OECD	Income Non-OECD
KOF Index of Globalisation	0.020 (1.84)*	0.003 (2.05)**	0.004 (0.37)	0.0003 (0.14)	0.007 (0.44)	0.001 (0.55)
Democracy, index	0.027 (0.90)	0.004 (0.73)	0.056 (1.48)	0.010 (1.29)	0.001 (0.03)	-4.19E-05 (0.01)
GDP per capita	-1.59E-04 (3.05)***	-2.75E-05 (2.51)**	-8.21E-05 (0.98)	-1.31E-05 (0.83)	-9.92E-05 (1.10)	-2.00E-05 (1.67)
GDP per capita (squared)	2.53E-09 (1.77)*	4.50E-10 (1.61)	1.17E-09 (0.59)	1.50E-10 (0.39)	1.85E-09 (0.73)	3.90E-10 (1.24)
Lagged dependent variable	0.59 (3.07)***	0.67 (4.95)***	0.78 (7.42)***	0.60 (4.94)***	0.65 (3.91)***	0.78 (3.92)***
Constant	-1.10 (2.11)**	1.30 (2.42)**	-0.18 (0.41)	1.59 (3.34)***	-0.68 (0.98)	0.90 (1.17)
Number of countries	100	99	27	26	73	73
Number of observations	380	379	119	118	261	261
Period dummies (Prob > F)	0.00	0.04	0.01	0.00	0.02	0.02
Sargan test (prob>chi2)	0.27	0.09	0.83	0.74	0.53	0.58
Arellano Bond test (pr>z)	0.33	0.52	0.99	0.18	0.25	0.46

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

⁷⁹ This amounts to standardised regression (beta) coefficients of 0.30 and 0.25, respectively. Overall, the regression models explain between 39 per cent and 77 per cent of the within-groups variation for inequality.

Table 4.20 reports the GMM estimates. As can be seen, democracy no longer significantly affects inequality. The impact of per capita GDP remains in the full samples; the lagged dependent variable is significant at the one per cent level in all regressions. Most importantly, the globalisation index remains significant at the ten per cent level in the overall sample.

We conduct a Sargan test of the validity of the instruments. As can be seen, in most regressions the test does not reject the over-identifying restrictions at conventional levels of significance. The Arellano-Bond test of second-order autocorrelation also fails to reject the specifications at conventional levels.

It should be noted that the time dummies, which are not reported in the tables, are jointly statistically significant at the ten per cent level in all the GMM regressions. We also employed a time trend instead of the period dummies – the main results are unchanged. Taken together the results lend some credence to the view that – while income and earnings inequality have not been inexorably trending – changes in inequality have not been “glacial”.⁸⁰

Table 4.21 Dimensions of globalisation and inequality (1970–2000, OLS)

	Wage All	Income All	Wage OECD	Income OECD	Wage Non-OECD	Income Non-OECD
Index of economic globalisation	0.008 (1.09)	0.001 (1.25)	0.010 (0.67)	0.002 (1.38)	0.008 (0.99)	0.001 (0.97)
Index of social globalisation	0.0001 (0.02)	0.001 (0.78)	-0.002 (0.35)	-0.001 (1.36)	-0.007 (0.74)	-0.001 (0.53)
Index of political globalisation	0.005 (1.49)	0.0004 (0.82)	0.003 (0.49)	-0.0004 (0.38)	0.005 (1.01)	0.0005 (0.78)
Democracy, index	0.037 (2.67)***	0.004 (2.08)**	0.044 (1.56)	0.008 (1.82)*	0.030 (1.91)*	0.004 (1.62)
GDP per capita	-1.26E-04 (3.53)***	-1.73E-05 (3.53)***	-7.99E-05 (0.93)	-8.41E-06 (0.93)	-1.60E-04 (2.45)**	-2.69E-05 (2.99)***
GDP per capita (squared)	2.66E-09 (3.14)***	4.00E-10 (3.02)***	9.70E-10 (0.62)	4.00E-11 (0.22)	3.76E-09 (2.05)**	7.00E-10 (2.76)***
Lagged dependent variable	0.33 (3.32)***	0.47 (5.83)***	0.57 (3.47)***	0.75 (8.13)***	0.30 (2.87)***	0.39 (4.00)***

⁸⁰ This finding concurs with Atkinson (1997, 2003) and Francois and Rojas-Romagosa (2005) who find that changes in inequality have been episodic rather than steadily trending and not “glacial”, as had been previously thought.

Table 4.21 (continued)

	Wage All	Income All	Wage OECD	Income OECD	Wage Non-OECD	Income Non-OECD
Number of countries	92	91	27	26	65	65
Number of observations	358	357	119	118	239	239
Period dummies (Prob > F)	0.03	0.05	0.07	0.05	0.01	0.04
Country dummies (Prob > F)	0.00	0.00	0.00	0.00	0.00	0.00
R squared (within)	0.45	0.55	0.61	0.78	0.45	0.48

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.22 Dimensions of globalisation and inequality (1970–2000, GMM)

	Wage All	Income All	Wage OECD	Income OECD	Wage Non-OECD	Income Non-OECD
Index of economic globalisation	0.002 (0.23)	-0.001 (0.44)	0.009 (0.95)	0.002 (1.59)	0.001 (0.15)	-0.001 (0.54)
Index of social globalisation	0.007 (1.01)	0.003 (2.70)***	-0.010 (0.99)	-0.002 (2.56)**	0.011 (0.82)	0.003 (1.15)
Index of political globalisation	0.003 (0.87)	-0.0002 (0.28)	0.007 (1.15)	0.001 (0.99)	0.004 (1.04)	0.0003 (0.29)
Democracy, index	0.046 (1.86)*	0.009 (2.82)***	0.051 (2.02)*	0.015 (3.94)***	0.018 (0.80)	0.003 (0.70)
GDP per capita	-1.51E-04 (2.58)**	-3.18E-05 (2.56)**	-7.35E-05 (1.05)	-1.51E-05 (1.47)	-1.46E-04 (1.68)*	-2.30E-05 (0.98)
GDP per capita (squared)	3.37E-09 (2.72)***	6.50E-10 (2.29)**	7.90E-10 (0.45)	2.40E-10 (0.95)	3.57E-09 (1.60)	5.10E-10 (0.86)
Lagged dependent variable	0.736 (3.18)***	0.558 (2.53)**	0.554 (2.09)**	0.475 (5.05)***	0.748 (3.64)***	0.732 (2.07)**
Constant	-0.540 (0.69)	1.766 (2.05)**	-1.302 (1.15)	1.935 (6.02)***	-0.661 (0.96)	1.074 (0.79)
Number of countries	100	100	27	26	73	74
Number of observations	379	340	119	110	260	230
Period dummies (Prob > F)	0.00	0.00	0.36	0.00	0.04	0.00
Sargan test (prob>chi2)	0.70	0.30	0.78	0.81	0.75	0.86
Arellano Bond test (pr>z)	0.23	0.59	0.16	0.52	0.10	0.75

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Tables 4.21 and 4.22 replicate the above analysis by replacing the aggregate globalisation index by the sub-indices for the three dimensions of globalisation. The results lack consistency across specifications and methods of estimation. While globalisation has no significant impact on inequality according to the OLS regressions, social globalisation increases income inequality at the five per cent level of significance in the overall sample. Social globalisation remains significant in the OECD sample, albeit with a negative coefficient. This seems to be consistent with the importance of social globalisation for explaining deunionisation.

Concluding Comments: As can sometimes be the case, theory has run well ahead of empirical work when it comes to understanding the impact of globalisation on the inequality of income or earnings. In addition, the proliferation of theories has yielded considerable uncertainty about what are the predicted effects of globalisation on inequality in both developed and developing countries. Theory has predicted that globalisation may have beneficial, adverse or insignificant effects on income or earnings inequality. Moreover, the economics profession has tended to narrowly focus on the more measurable dimensions of economic globalisation and market integration, in particular, the effects of liberalising international trade. However, it seems clear that globalisation is multi-faceted. Recent research increasingly identifies the fact that changes to social institutions and political integration may be equally important elements of the widespread concern about globalisation. This research suggests that globalisation has effects on the returns to labour market participation and therefore earnings and income inequality that work through its effects on labour market and political institutions, to say nothing of social norms.

Overall, globalisation has indeed exacerbated inequality. However, this result only prevails in the overall sample of countries. We can therefore not make any predictions as to whether developed or developing countries are more likely to experience rising inequality as a consequence of globalisation. Moreover, once again we find some evidence that the social dimension of globalisation may be having profound effects on economic welfare.

4.6 Globalisation and the natural environment

The impact of globalisation on the natural environment has been subject to heated debate.⁸¹ Clearly, one of the main channels through which globalisation might affect the natural environment is the economic dimension. However, whether trade liberalisation and economic globalisation are beneficial or detrimental to the environment is the subject of considerable controversy.⁸² According to WTO (2004), trade liberalisation improves the allocation and efficient use of natural resources.

⁸¹ For an in depth discussion, see MacMillan (2001).

⁸² Alpay (2002) provides an extensive summary.

The Secretariat of the WTO identifies a range of channels through which the removal of trade restrictions improves environmental quality.⁸³ Among them is the more efficient factor use through enhanced competition, poverty reduction through trade expansion and encouragement of a sustainable rate of natural resource exploitation as well as an increase in the availability of environment-related goods and services through market liberalisation. Firms from developed countries might find it cheaper to use the same technology for production in developing countries that they use at home, thus contributing to cleaner production in the developing country. In their review article, Beghin and Potier (1997) conclude that trade liberalisation does not induce wholesale specialisation in dirty manufacturing industries in the developing world. Wheeler et al. (1992) show that liberalisation contributed to the international diffusion of clean technology in wood pulp production.

By expanding the scale of production, trade liberalisation can, however, also decrease environmental quality. According to Reed (1996) and Daly (1996), trade liberalisation discourages the internalisation of environmental costs in developing countries as a consequence of increased competition from developed countries. Environmental standards might be considered *de facto* non-tariff barriers so they would be discouraged. As Killick (1993) points out, liberalisation is likely to induce a shift in production towards tradable goods, increasing pressure to exploit natural resources.

Evidence in favour of a negative link from liberalisation to environmental quality is provided by Mani and Wheeler (1999). Their cross-section analysis shows that pollution intensive production has fallen considerably in the OECD while it has risen in the developing world.⁸⁴ Giordano (1994) suggests that free trade can compound over-exploitation of natural resources in countries without clearly defined property rights.

While the other two dimensions of globalisation may also have ambiguous effects on environmental quality, the effects are more likely to be beneficial. As for the political dimension of globalisation, it might be argued that increased global integration facilitates the negotiation of international environmental agreements. Social integration is concerned with the increased flows of information, and indirectly technological improvement, which are consistent with a cleaner environment. However, these arguments are highly speculative and need to be confronted with the data.

Data and Method: The regressions employ cross-sectional and pooled time-series cross-sectional data. Once again, the panel data are averages over five year intervals. They cover the time period 1970–2000 and extend to a maximum of 111 countries. Since some of the data are not available for all countries or all periods,

⁸³ WT/CTE/W/67, 7 November 1997, “Environmental benefits of removing trade restrictions and distortions”, Note by the Secretariat.

⁸⁴ However, Mani and Wheeler (1999) also show that the tendency to form pollution havens is quite limited. See also Cole (2004).

the panel is unbalanced and the number of observations depends on the choice of explanatory variables. The cross-section-analysis uses the most recent data available for the dependent variables and averages over the last 30 years for the explanatory variables.

Our panel model takes the following form:

$$ENV_{i,t} = \alpha + \beta G_{i,t} + \gamma' X_{i,t} + \eta_i + \varepsilon_{i,t}, \quad (4.6)$$

where i indexes countries and t time, ENV is the respective indicator of environmental quality, G represents the measure of globalisation, X is a vector of exogenous variables, η is a country fixed effect and ε is a normally distributed random disturbance.

We employ five dependent variables to examine the impact of globalisation on the natural environment. The first is biochemical oxygen demand (BOD) which is a proxy for water pollution.⁸⁵ According to the European Environment Agency, a high demand can indicate falling levels of dissolved oxygen, implying dangerous consequences for river diversity.⁸⁶

Two further measures come from the literature on air pollution. Specifically, we use carbon dioxide (CO₂) and sulphur dioxide (SO₂) emissions (as in Gassebner, Lamla and Sturm, 2006). We include the logarithm of CO₂ and SO₂ (in metric tonnes per capita).⁸⁷ The SO₂ data for the period 1970–2000 are available for a maximum of about 200 countries and are taken from Stern (2005). In constructing the dataset, Stern combined various sources and interpolated or extrapolated missing data: “*For the remaining countries and for missing years for countries with some published data, [he] interpolate[s] or extrapolate[s] estimates using either an econometric emissions frontier model, an environmental Kuznets curve model, or a simple extrapolation, depending on the availability of data*” (Stern, 2005, p. 163). While these data provide a good overview of the evolution of sulphur emissions in the past decade for a substantial part of the world, employing the environmental Kuznets curve in their construction makes them problematic (Gassebner, Lamla and Sturm, 2006).

As a fourth measure of environmental quality we employ round wood production (measured as the logarithm of thousand cubic meters produced per capita). Data are available from the Food and Agriculture Agency of the United Nations (FAO) over the period 1970–2003 for about 170 countries.

⁸⁵ BOD is available for a maximum of 114 countries over the period 1980–2001 (World Bank, 2005). We employ the logarithm of emissions in kilograms per day and per capita.

⁸⁶ http://themes.eea.eu.int/Specific_media/water/indicators/bod/index_html (accessed September 10, 2007).

⁸⁷ Data for CO₂ are available for up to 188 countries covering the years 1970 to 2000 (World Bank, 2005). However, as Gassebner, Lamla and Sturm (2006) point out, these data are based on calculations instead of being measured directly.

The fifth measure is not an outcome variable, but a composite index intended to measure environmental sustainability. The Environmental Sustainability Index (ESI) is calculated by The Environmental Performance Measurement Project in collaboration with the Center for International Earth Science Information Network (CIESIN) and the World Economic Forum (Esty et al., 2005). The ESI is a composite index tracking a diverse set of socio-economic, environmental and institutional indicators that characterise and influence environmental sustainability at the national level. As these data are not available prior to 2001, we cannot employ panel data methods. We use the most recent data (i.e., 2005) for a cross-section analysis.

The selection of control variables follows the previous literature as closely as possible. In choosing the covariates for the CO₂, SO₂ and BOD equations, we rely on the robustness analysis of Gassebner, Lamla and Sturm (2006).⁸⁸ We employ those variables that have been shown to be robust and are available for a sufficient number of countries and years. More specifically, we use the level and square of (the logarithm of) GDP per capita to take account of the environmental Kuznets curve. A dummy for left-wing governments is included to account for their preference for environmental protection. A dummy for dictatorships is employed. Congleton (1992) shows that autocratic countries are inclined to select less stringent environmental regulations. He argues that dictators tend to have shorter time horizons and are less likely to adopt pro-environment policies, since the benefits of doing so are likely to accrue only after they have left office, whereas the costs are incurred earlier.⁸⁹ We include population density and the share of urban population in total population to account for demographic factors. Higher population density and greater urbanisation are likely to increase pollution. The value added in the manufacturing industry (as a percentage of GDP) takes account of a country's industrialisation. It is hypothesised to increase pollution.

Finally, fertiliser consumption (in 100 grams per hectare of arable land) is employed. According to Gassebner, Lamla and Sturm (2006), fertiliser consumption can be interpreted as reflecting a country's general attitude towards environmental protection. In low income countries, fertiliser is relatively easy and cheap to produce but its production is pollution intensive. The presence of these "dirty" industries is likely to be associated with greater water and air pollution. All variables with their exact sources and definitions are again listed in Appendix A.

⁸⁸ See Table A-2 of Gassebner, Lamla and Sturm (2006) for an overview of the empirical literature. For a robustness test employing Bayesian averaging of classical estimates see Lamla (2007).

⁸⁹ For reasons other than the expected shorter duration of dictatorships, Olson (1993) argues that dictators wish to maximise tax revenues and thus oppose any policies that would reduce revenue, e.g., those that result from increased pollution abatement expenditures. See also Gassebner, Gaston and Lamla (2008).

In choosing the covariates for the analysis of round wood production we follow Pandey and Wheeler (2001). We therefore include (the log of) the export and import prices for round wood, the quantity of world exports of round wood and the oil price in the list of explanatory variables. As none of these additional variables turn out to be significant at conventional levels, we retain the model introduced for CO₂, SO₂ and BOD. We also use the same covariates when analysing the environmental sustainability index.

Table 4.23 Globalisation and the natural environment (1970–2000, panel)

	(1)	(2)	(3)	(4)
	CO ₂	SO ₂	BOD	Round wood
KOF Index of globalisation	0.002 (1.00)	-0.025 (6.43)***	-0.014 (4.49)***	0.002 (0.70)
(Log) GDP p.c.	0.879 (3.03)***	3.554 (6.36)***	0.809 (1.82)*	0.205 (0.67)
(Log) squared GDP p.c.	-0.017 (0.88)	-0.202 (5.50)***	-0.026 (0.92)	-0.011 (0.52)
Dictatorship, dummy	-0.106 (2.71)***	-0.040 (0.53)	-0.038 (0.63)	-0.016 (0.41)
Manufacture, value added	0.018 (4.79)***	0.008 (1.06)	0.020 (3.53)***	-0.019 (4.95)***
Fertiliser (per hectare)	0.000 (2.02)**	0.000 (1.43)	0.000 (2.20)**	0.000 (0.41)
Population density	0.001 (3.02)***	-0.000 (0.06)	0.001 (1.95)*	-0.002 (2.59)**
Urbanisation	0.002 (0.66)	0.009 (1.76)*	0.009 (2.03)**	-0.020 (6.87)***
Government left-wing, dummy	0.019 (0.48)	-0.172 (2.23)**	0.023 (0.47)	-0.008 (0.21)
Number of countries	111	110	105	102
Number of observations	545	541	362	509
R ² (within)	0.40	0.23	0.25	0.25

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Results: Table 4.23 reports the panel results for CO₂, SO₂, BOD and round wood production. As can be seen, the results show only limited support for the environmental Kuznets curve hypothesis: In most regressions per capita GDP significantly increases environmental damage. However, its square has a significantly negative coefficient only on SO₂ emissions. Round wood production is neither significantly affected by GDP nor its square.⁹⁰ The results also show that CO₂ emissions are higher with bigger manufacturing sectors. More intensive use of fertiliser generally harms the environment. Regarding population density and urbanisation, the results are mixed. CO₂ emissions and water pollution significantly increase with greater population density, while greater urbanisation implies increasing SO₂ emissions and water pollution. Round wood production, on the contrary, is significantly lower in more populated and urbanised areas. The results also show that left-wing governments significantly reduce SO₂ emissions. Dictatorships exert a significantly negative impact on the amount of CO₂ emissions, but do not significantly affect the other measures of environmental quality employed here.

Turning to the Index of Globalisation, the results show that SO₂ emissions and water pollution are significantly reduced by globalisation. Specifically, an increase in the index by one point reduces SO₂ emissions by 2.5 per cent and water pollution by 1.4 per cent. CO₂ emissions and round wood production are not significantly affected by globalisation. Overall, our analysis shows that globalisation has been beneficial for the measures of environmental quality that we have used here.

⁹⁰ To some extent, these results are contrary to Lamla (2007), showing robust support for the environmental Kuznets curve hypothesis. See also Gassebner, Gaston and Lamla (2008).

Table 4.24 Dimensions of globalisation and the natural environment (1970–2000, panel)

	(1) CO ₂	(2) SO ₂	(3) BOD	(4) Round wood
Index of economic globalisation	–0.001 (0.67)	–0.024 (6.97)***	–0.010 (3.72)***	0.003 (1.76)*
(Log) GDP p.c.	0.579 (2.00)**	3.696 (6.13)***	1.081 (2.34)**	0.132 (0.40)
(Log) squared GDP p.c.	0.002 (0.12)	–0.220 (5.52)***	–0.050 (1.69)*	–0.005 (0.22)
Dictatorship, dummy	–0.083 (2.11)**	–0.016 (0.20)	–0.040 (0.64)	–0.044 (1.03)
Manufacture, value added	0.015 (4.12)***	0.002 (0.25)	0.022 (3.86)***	–0.016 (3.99)***
Fertiliser (per hectare)	0.000 (2.30)**	0.000 (0.62)	0.000 (1.85)*	0.000 (0.64)
Population density	0.001 (3.33)***	–0.001 (0.77)	0.001 (1.46)	–0.002 (2.33)**
Urbanisation	0.007 (2.80)***	0.014 (2.52)**	0.006 (1.50)	–0.025 (7.92)***
Government left-wing, dummy	–0.031 (0.80)	–0.229 (2.86)***	0.019 (0.39)	–0.003 (0.07)
Number of id	100	99	95	93
Observations	490	486	335	464
R ² (within)	0.43	0.26	0.26	0.25

Table 4.24 (continued)

	(5) CO ₂	(6) SO ₂	(7) BOD	(8) Round wood
Index of social globalisation	0.003 (1.80)*	-0.022 (6.96)***	-0.009 (3.49)**	-0.001 (0.31)
(Log) GDP p.c.	0.928 (3.19)***	3.187 (5.72)***	0.693 (1.53)	0.149 (0.47)
(Log) squared GDP p.c.	-0.021 (1.11)	-0.177 (4.79)***	-0.021 (0.71)	-0.005 (0.21)
Dictatorship, dummy	-0.104 (2.66)***	-0.037 (0.49)	-0.043 (0.70)	-0.020 (0.50)
Manufacture, value added	0.020 (5.09)***	0.007 (0.95)	0.022 (3.99)***	-0.021 (5.28)***
Fertiliser (per hectare)	0.000 (1.90)*	0.000 (1.58)	0.000 (2.08)**	0.000 (0.51)
Population density	0.001 (2.92)***	-0.000 (0.16)	0.001 (1.59)	-0.001 (2.34)**
Urbanisation	0.001 (0.34)	0.009 (1.73)*	0.005 (1.27)	-0.018 (6.59)***
Government left-wing, dummy	0.016 (0.41)	-0.165 (2.16)**	0.015 (0.29)	-0.006 (0.14)
Number of id	111	110	105	102
Observations	545	541	362	509
R ² (within)	0.40	0.25	0.23	0.25

Table 4.24 (continued)

	(9) CO ₂	(10) SO ₂	(11) BOD	(12) Round wood
Index of political globalisation	-0.001 (0.64)	-0.004 (1.34)	-0.007 (3.72)***	0.002 (1.17)
(Log) GDP p.c.	0.902 (3.08)***	3.654 (6.21)***	0.979 (2.18)**	0.153 (0.50)
(Log) squared GDP p.c.	-0.016 (0.85)	-0.228 (5.92)***	-0.048 (1.69)*	-0.007 (0.33)
Dictatorship, dummy	-0.110 (2.82)***	0.019 (0.24)	-0.017 (0.28)	-0.021 (0.54)
Manufacture, value added	0.017 (4.68)***	0.024 (3.36)***	0.027 (5.34)***	-0.020 (5.57)***
Fertiliser (per hectare)	0.000 (2.19)**	0.000 (0.68)	0.000 (1.77)*	0.000 (0.45)
Population density	0.001 (3.41)***	-0.001 (1.34)	0.001 (1.66)*	-0.002 (2.65)***
Urbanisation	0.004 (1.53)	-0.005 (1.08)	0.006 (1.38)	-0.020 (7.43)***
Government left-wing, dummy	0.025 (0.63)	-0.202 (2.50)**	0.010 (0.20)	-0.010 (0.26)
Number of id	111	110	105	102
Observations	545	541	362	509
R ² (within)	0.39	0.16	0.23	0.25

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.24 replicates the analysis employing the three sub-dimensions of the overall KOF Index. According to the results, SO₂ emissions and water pollution are significantly reduced by economic and social globalisation, with similar magnitudes across the two dimensions. Economic globalisation increases round wood production, at the ten per cent level of significance. Also at the ten per cent level, social globalisation increases CO₂ emissions. In addition, political integration reduces water pollution (at the one per cent level of significance). According to the coefficient estimate, an increase in political globalisation by one point reduces pollution by 0.7 per cent.

To summarise, there are some positive environmental consequences of globalisation, when attention is restricted to the medium term.

Tables 4.25 and 4.26 show the results for the 30-year cross-sectional average, including the environmental sustainability index. As can be seen, in the long run the positive impact of globalisation on some of the measures of environmental quality disappears. In fact, columns 3 and 4 of Table 4.25 show that water pollution and round wood production increased as a consequence of increasing globalisation over the last 30 years. CO₂ and SO₂ emissions and the environmental sustainability index are not significantly affected by globalisation.

Turning to the individual dimensions of globalisation, Table 4.26 shows that the results are largely driven by the economic dimension of globalisation. Economic globalisation increases water pollution, SO₂ emissions and round wood production, at least at the ten per cent level of significance. Regarding water pollution and round wood production, the same is true for social integration, while political integration did not significantly affect the natural environment in the longer run. Regarding the environmental sustainability index, we fail to find any significant effect associated with the measures of globalisation.

Of course, our answers to this most controversial of issues are suggestive and certainly not the last word on the matter. On the other hand, our results do not vindicate painting globalisation as the bogey man for the environment.⁹¹ Of course, this conclusion awaits further scrutiny by other researchers.

⁹¹ Gassebner, Gaston and Lamla (2008) reach a similar conclusion with respect to environmental policy. Proxying environmental stringency by the lead content of gasoline, they find that the KOF Index has no statistically significant effect. While they do find that economic considerations are important, it is domestic rather than international concerns that drive environmental policy.

Table 4.25 Globalisation and the natural environment (cross-section)

	(1) CO ₂	(2) SO ₂	(3) BOD	(4) Round wood	(5) Sustainability
KOF Index of Globalisation	0.011 (1.54)	0.002 (0.16)	0.015 (1.75)*	0.047 (2.86)***	0.076 (0.83)
(Log) GDP p.c.	3.402 (6.49)***	2.456 (3.27)***	1.402 (2.29)**	-1.641 (2.32)**	-5.768 (1.15)
(Log) squared GDP p.c.	-0.165 (5.03)***	-0.149 (3.19)***	-0.073 (1.99)*	0.100 (2.22)**	0.382 (1.13)
Dictatorship, dummy	0.347 (1.32)	0.708 (2.45)**	-0.138 (0.66)	-0.836 (1.58)	-8.298 (3.99)***
Manufacture, value added	0.018 (1.04)	0.010 (0.52)	0.048 (5.33)***	0.025 (1.12)	0.060 (0.42)
Fertiliser (per hectare)	-0.000 (0.39)	0.000 (1.38)	0.000 (0.67)	-0.000 (2.54)**	0.000 (2.47)**
Population density	0.000 (0.89)	-0.000 (1.87)*	-0.000 (0.69)	-0.004 (2.88)***	-0.029 (2.64)***
Urbanisation	0.000 (0.03)	0.023 (2.16)**	-0.009 (1.40)	-0.022 (2.02)**	0.012 (0.18)
Government left-wing, dummy	0.059 (0.32)	-0.035 (0.14)	-0.018 (0.08)	0.068 (0.24)	0.931 (0.58)
Number of observations	111	110	51	102	103
R ² (within)	0.84	0.46	0.66	0.40	0.43

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

Table 4.26 Dimensions of globalisation and the natural environment (cross-section)

	(1) CO ₂	(2) SO ₂	(3) BOD	(4) Round wood	(5) Sustainability
Index of economic globalisation	0.009 (1.41)	0.018 (1.95)*	0.012 (2.05)**	0.031 (2.81)***	0.021 (0.36)
(Log) GDP p.c.	3.254 (5.47)***	2.295 (2.84)***	0.861 (1.25)	-2.931 (3.44)***	-8.900 (1.79)*
(Log) squared GDP p.c.	-0.160 (4.62)***	-0.149 (3.05)***	-0.039 (0.96)	0.186 (3.78)***	0.638 (1.91)*
Dictatorship, dummy	0.242 (0.82)	0.715 (2.27)**	-0.123 (0.58)	-0.453 (1.15)	-7.502 (3.28)***
Manufacture, value added	0.018 (1.05)	0.008 (0.42)	0.052 (5.48)***	0.061 (2.44)**	0.115 (0.76)
Fertiliser (per hectare)	-0.000 (0.39)	0.000 (1.36)	0.000 (0.51)	-0.000 (2.61)**	0.000 (2.36)**
Population density	0.000 (0.60)	-0.000 (2.33)**	-0.000 (0.75)	-0.004 (2.72)***	-0.030 (2.62)**
Urbanisation	0.004 (0.61)	0.024 (2.23)**	-0.006 (1.02)	-0.014 (1.29)	0.008 (0.11)
Government left-wing, dummy	0.188 (0.87)	0.138 (0.47)	0.067 (0.31)	0.132 (0.44)	0.871 (0.46)
Observations	100	99	51	93	92
R ² (within)	0.83	0.45	0.67	0.47	0.46

Table 4.26 (continued)

	(6) CO ₂	(7) SO ₂	(8) BOD	(9) Round wood	(10) Sustainability
Index of social globalisation	0.000 (0.06)	-0.007 (0.66)	0.014 (2.28)**	0.044 (4.13)***	0.067 (0.94)
(Log) GDP p.c.	3.240 (6.15)***	2.342 (3.09)***	1.182 (1.84)*	-1.817 (2.62)**	-5.936 (1.18)
(Log) squared GDP p.c.	-0.150 (4.57)***	-0.137 (2.90)***	-0.059 (1.59)	0.110 (2.53)**	0.393 (1.16)
Dictatorship, dummy	0.326 (1.26)	0.668 (2.36)**	-0.085 (0.42)	-0.655 (1.31)	-8.146 (3.77)***
Manufacture, value added	0.023 (1.34)	0.013 (0.73)	0.048 (5.34)***	0.026 (1.20)	0.065 (0.44)
Fertiliser (per hectare)	-0.000 (0.70)	0.000 (1.38)	0.000 (0.61)	-0.000 (2.55)**	0.000 (2.63)***
Population density	0.000 (1.03)	-0.000 (1.70)*	-0.000 (0.73)	-0.005 (3.01)***	-0.029 (2.63)**
Urbanisation	0.001 (0.21)	0.023 (2.20)**	-0.008 (1.34)	-0.018 (1.59)	0.017 (0.25)
Government left-wing, dummy	0.086 (0.45)	-0.024 (0.10)	0.004 (0.02)	0.129 (0.47)	1.099 (0.67)
Observations	111	110	51	102	103
R ² (within)	0.84	0.46	0.67	0.44	0.43

Table 4.26 (continued)

	(11) CO ₂	(12) SO ₂	(13) BOD	(14) Round wood	(15) Sustainability
Index of political globalisation	0.004 (1.03)	-0.005 (0.88)	-0.005 (1.17)	-0.005 (0.66)	0.012 (0.30)
(Log) GDP p.c.	3.448 (6.23)***	2.191 (3.07)***	0.609 (0.68)	-2.833 (3.51)***	-6.360 (1.29)
(Log) squared GDP p.c.	-0.164 (4.77)***	-0.130 (3.01)***	-0.016 (0.30)	0.199 (3.93)***	0.454 (1.41)
Dictatorship, dummy	0.289 (1.03)	0.740 (2.55)**	-0.132 (0.60)	-0.791 (1.42)	-8.685 (3.90)***
Manufacture, value added	0.018 (1.02)	0.016 (0.86)	0.051 (5.93)***	0.044 (1.81)*	0.081 (0.61)
Fertiliser (per hectare)	-0.000 (0.34)	0.000 (1.33)	0.000 (1.08)	-0.000 (2.01)**	0.000 (2.44)**
Population density	0.000 (1.26)	-0.000 (2.23)**	-0.000 (1.19)	-0.005 (3.41)***	-0.030 (2.70)***
Urbanisation	-0.000 (0.02)	0.025 (2.38)**	-0.003 (0.51)	-0.013 (1.23)	0.012 (0.17)
Government left-wing, dummy	0.044 (0.24)	0.016 (0.06)	0.117 (0.47)	0.168 (0.56)	1.035 (0.63)
Observations	111	110	51	102	103
R ² (within)	0.84	0.46	0.65	0.36	0.43

Absolute value of t-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1% level.

5 CONCLUSION

Describing globalisation remains a complex task. It is the interactive co-evolution of millions of technological, cultural, economic, social and environmental trends at all conceivable spatio-temporal scales. Despite the continuing controversy surrounding the exact forces and the historical path that generated globalisation, we have shown that it is possible to measure globalisation using indices. In this monograph, in addition to describing other leading indices of globalisation, we have explained how the KOF Index of Globalisation has been constructed. We have also illustrated how the KOF Index can be used to gauge the consequences of globalisation.

There are many issues to deal with when undertaking to measure globalisation. To begin with, globalisation is a highly complex and multi-faceted phenomenon which is understood and experienced in different ways. Measurement inevitably involves simplification. This is both an asset and a shortcoming. In the process of simplification, the analytical value of an index needs to remain intact in order to constitute a meaningful explanation of globalisation.

In large part, the composite indices of globalisation have been constructed due to the need to analyse globalisation as an encompassing process, which may have effects greater than the sum of its constituent parts. Each index of globalisation adopts methods to process the data and to assign weights to individual indicators considered integral to globalisation. While the measurement process requires a scientific and dispassionate approach, some degree of arbitrariness is inevitable. Accordingly, complete transparency about the choices made at the various stages of the measurement process is essential for any bona fide measurement of globalisation.

Unfortunately, at least at the time of writing, some measurement problems are simply intractable. An important unresolved issue is how to develop measures that appropriately distinguish between internationalisation and globalisation. Also, like most other analyses, the approach we have adopted is to take the nation-state as the relevant unit of analysis. This is obviously problematic. For example, it may be possible to study internationalisation in this way, but not globalisation. In other words, the currently available globalisation measures are vitiated by what has been variously called *methodological nationalism* (Beck, 2004), *embedded statism* (Sassen, 2000) or *methodological territorialism* (Scholte, 2000). This perspective may distort the essence of globalisation. Further, this approach may produce data that “*in the best of cases are irrelevant and in the worse misleading, or even false*”.⁹²

⁹² Beck-Gernsheim (2004), as quoted by Caselli (2006, p. 20).

The undertaking of measuring globalisation needs to consider advances in both qualitative and quantitative research in order to facilitate better measurement. Qualitative research generally focusses on multi-dimensional analyses of globalisation by constructing frameworks and concepts through which to better understand it. This supplies some valuable tools, but not a solid scientific footing that can tackle the entire and complex phenomenon of globalisation. Quantitative research generally seeks a more definitive picture of globalisation by developing data, statistics and indices. However, not only do matters often run the risk of becoming over-simplified in this way, they are also afforded a semblance of fact that may not be warranted.

An understanding of the essential nature of globalisation requires interdisciplinary co-operation. Despite the different methodologies, choice of variables and weights, priorities and discussion, researchers need to recognise that in order to coherently study globalisation, new multi-dimensional perspectives and frameworks are needed.

In this monograph, we have updated and substantially improved upon the KOF Index of Globalisation originally developed in Dreher (2006a). The index measures the economic, social and political dimensions of globalisation and allows comparison of the degree and change in globalisation for a large number of countries and for a period of more than 30 years. The KOF Index of Globalisation 2007 is available for 122 countries for the period 1970–2004; it is calculated using data for 25 variables widely thought to be associated with modern globalisation. The method employed in the measurement process allows direct comparison of any country's degree of globalisation over time.

The economic dimension of the globalisation index measures long distance flows of goods, capital and services as well as information and perceptions that accompany market exchanges. In addition to actual flows of international trade and foreign investment, it captures the degree to which a country restricts capital and trade flows. The social dimension measures the spread of ideas, information, images and people. The political dimension captures the diffusion of government policies.

The new KOF Index measures globalisation on a scale of 1–100, where the underlying variables enter in percentiles. Accordingly, compared to older versions of the index, the impact of extreme data points is reduced. This has the benefit of introducing fewer inexplicable fluctuations over time. Three variables included in previous versions of the index are no longer included: the costs of a telephone call to the United States, the number of telephone mainlines and the number of newspapers sold. In lieu, five variables are now included in the KOF Index: the level of foreign direct investment (measuring economic integration), the number of letters sent and received from abroad (measuring direct interaction among people in different countries), the number of Ikea shops located in a country (measuring convergence of taste), international trade in books (measuring cultural exchange) and international trade in newspapers (measuring the availability of international information).

According to the KOF Index, Belgium and Austria are the world's most globalised countries. The Index shows that globalisation continues apace. It is largely being driven by increased economic and political globalisation, with social globalisation apparently slowing. The degree of globalisation increased since the 1970s, but has been rapidly accelerating since the mid-1980s. Figures 3.8 and 3.9 reveal that this development has been relatively independent of national income and region, even though the degree of globalisation varies considerably. According to the Index, globalisation has been most pervasive in Western, high income countries. In these countries, however, the process of globalisation has essentially ground to a halt since 2001.

Belgium and Austria have been at the top of the globalisation ranking since 2001. At the bottom of the current ranking are Burundi, the Central African Republic and Myanmar. Countries at the bottom of the ranking consistently score lower across all three dimensions and the degree of globalisation in the ten least globalised countries is about one third of that for the ten most globalised ones. Regarding economic globalisation – and in line with the results for previous years – Luxembourg has the highest score by a considerable margin. Singapore ranks second, followed by Ireland and Belgium – each of them small open economies. The least globalised nations in economic terms are Iran, Bangladesh and Niger.

The social globalisation ranking is headed by Austria, Singapore, Belgium and the Netherlands; while Myanmar, Bangladesh, Haiti and Mali place at the bottom of the ranking. According to the political sub-index of globalisation, France is the world's most globalised country. The United States, Russia and United Kingdom are also among the most politically globalised countries, while the Bahamas, Burundi, Barbados and Rwanda have the lowest political globalisation scores.

Applying the KOF Index of Globalisation to some of the arguably more interesting research questions about the consequences of globalisation, our results showed that globalisation cannot universally be considered as being either good or bad. The judgement depends on the research issue under the spotlight, the subset of countries considered and the time period under consideration.

Globalisation has been criticised as being responsible for shifting the tax burden from mobile capital onto immobile labour. The results, however, indicated that globalisation has not robustly affected government spending and taxation. In other words, globalisation has *not* lead to a race-to-the-bottom in fiscal policy. On the other hand, a more subtle argument assumes that – even if the level of government expenditure remains unchanged – globalisation might still change the composition of expenditures. Economic theory suggests that different kinds of government expenditures are likely to react differently to globalisation. According to the disciplining hypothesis, globalisation restrains governments by increased budgetary pressure. As a consequence, governments shift their expenditures away from transfers and subsidies towards, e.g., capital expenditures. The compensation hypothesis, on the other hand, is expected to give rise to a higher share of social expenditures. The expenditure shift induced by the disciplining effect might therefore be diminished, neutralised or even reversed by spending on citizens

compensated or insured against the risks of globalisation. We did find evidence for this latter claim. The econometric findings revealed that there have been globalisation-induced effects on the composition of government expenditures. Overall, the most robust result appeared to support the compensation hypothesis. In other words, countries that are more politically globalised spend higher shares of their expenditure on subsidies and lower shares on goods. Even for unchanged levels of government expenditures, globalisation therefore seems to have exerted an influence on government spending.

Contrary to the beliefs of its critics, the results showed that there is some evidence that globalisation does promote economic growth. The overall KOF Index is highly significant in most specifications estimated and was quite robust to the inclusion of different sets of covariates in any model specification and to different estimation methods. The effects were economically relevant and sizable.

On average, countries that were more globalised experienced higher growth rates. This is especially true for social integration and – in developed countries – the absence of restrictions on trade and capital. The significance of globalisation did depend on the sample of countries analysed. Still, the argument that poverty persists because of globalisation is a suspect one. On the contrary, the countries with the lowest growth rates are those that have failed to globalise. Countries such as Rwanda and Zimbabwe, e.g., have insulated themselves from the world economy. They have poor institutions that suppress growth and fail to alleviate poverty.

One of the striking economic facts of the 1980s and early 1990s in many developed economies was the deterioration in the relative labour market outcomes for unskilled labour. Over the same period, it has been argued, these same countries experienced an increase in globalisation. The indirect effects of globalisation raise the possibility that institutions, which have compressed wages in the past, have been eroded or altered by the various elements of globalisation. A prominent example is the possibility that deunionisation has been driven by globalisation. Given the traditional role that unions have played in supporting the wages of less- and semi-skilled workers, the erosion of union bargaining power would lead to a widening in the skilled wage premium that would superficially appear to be unrelated to the direct effects of globalisation. Since the early 1980s, union membership in most OECD economies has fallen. The process of deunionisation roughly coincides with the rapid globalisation of the very same economies. It has been common practice to associate these developments. We revisited the issue of whether the decline of union density can be explained by globalisation, finding that economic and social integration has been important for unionisation. Specifically, the economic and social dimensions of globalisation have adversely affected union membership. Social integration is concerned with the spread of ideas, information, images and people. Some authors have argued that social integration implies an Americanisation of institutions and policies. Regardless of whether this is considered to be a race-to-the-top or a race-to-the-bottom, the implication for

many developed countries is that their labour markets are now less unionised with wage bargaining occurring at increasingly decentralised levels.

Regarding the potential impact of globalisation on inequality, theory has run well ahead of empirical work. In addition, the proliferation of theories has yielded considerable uncertainty about what are the predicted effects of globalisation on inequality in both developed and developing countries. Theory has predicted that globalisation may have beneficial, adverse or insignificant effects on income and earnings inequality. Moreover, the economics profession has tended to narrowly focus on the more measurable dimensions of economic globalisation and market integration, in particular, the effects of liberalising international trade. However, recent research increasingly identifies the fact that changes to social institutions and political integration may be equally important elements of the widespread concern about globalisation. This research suggests that globalisation has effects on the returns to labour market participation and therefore earnings and income inequality that work through its effects on labour market and political institutions, to say nothing of social norms.

According to our results, globalisation has exacerbated inequality. However, this result only prevailed in the full sample of countries. We therefore did not make any predictions as to whether developed or developing countries are more likely to experience rising inequality as a consequence of globalisation. Interestingly, we once again found evidence that the social dimension of globalisation may be having profound effects on economic welfare.

Finally, our empirical results showed that there seem to be some positive environmental consequences of globalisation, but only if attention is restricted to the medium term. In the longer run, economic globalisation increases water pollution, sulphur dioxide emissions and round wood production. Regarding water pollution and round wood production, the same is true for social integration, while political integration did not significantly affect the natural environment in the longer run.

Overall, globalisation can not be considered to be universally good or bad. Globalisation increases economic growth, but also inequality. It is beneficial to the natural environment in the medium term, but harmful in the longer run. Deunionisation increases as a consequence of globalisation. How to weigh, e.g., the positive impact of globalisation on economic growth against reduced deunionisation is not obvious and, clearly, the overall judgement depends on one's preferences and political inclinations.

In most economists' reading (including two of the authors), the average effect of globalisation on the economy appears to be positive in net terms. However, it is obvious that globalisation also produces losers. This is hardly surprising, because globalisation affects the underlying structure of economies causing the shift of workers and other factors of production from industry to industry as well as from country to country. According to normative economic theory, the losers from these structural shifts should be compensated from the winners' gains. Of course, it is stating the obvious that they most often are not. This is one reason for the visible concern about globalisation. Transfers from the winners to the losers of

globalisation are more difficult to implement in practice than in theory. First, the losers have to be identified. Secondly, they have to be compensated without producing adverse incentives to the economy as a whole. At a minimum, this monograph hopefully constitutes a first step in helping to address the first of these issues. The second, more pressing one, remains as one of the most challenging research questions for social scientists.

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APPENDIX A: SOURCES AND DEFINITIONS

Variables	Definition	Source
<i>KOF Index of Globalisation 2007</i>		
<i>Index of economic globalisation</i>		
<i>(i) Data on actual flows</i>		
Trade (per cent of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. Data are in per cent of GDP.	World Bank (2006)
Foreign direct investment, flows (per cent of GDP)	Gross FDI is the sum of the absolute values of inflows and outflows of FDI recorded in the balance of payments financial account. It includes equity capital, reinvestment of earnings, other long-term capital and short-term capital. Data are in per cent of GDP.	World Bank (2006)
Foreign direct investment, stocks (per cent of GDP)	Sum of inward and outward FDI stock as a percentage of GDP.	UNCTAD (2005)
Portfolio investment (per cent of GDP)	Portfolio investment is the sum of the absolute values of inflows and outflows of portfolio investment recorded in the balance of payments. Data are in per cent of GDP.	IMF (2006)
Income payments to foreign nationals (per cent of GDP)	Income payments refer to employee compensation paid to non-resident workers and investment income (payments on direct investment, portfolio investment, other investments). Income derived from the use of intangible assets is excluded. Data are in per cent of GDP.	World Bank (2006)
<i>(ii) Data on restrictions</i>		
Hidden import barriers	The most recent index is based on the survey question: "In your country, tariff and non-tariff barriers significantly reduce the ability of imported goods to compete in the domestic market". Previous years use: "Hidden import barriers—no barriers other than published tariffs and quotas".	Gwartney and Lawson (2006)
Mean tariff rate	As the mean tariff rate increases, countries are assigned lower ratings. The rating declines toward zero as the mean tariff rate approaches 50 per cent.	Gwartney and Lawson (2006)

Variables	Definition	Source
Taxes on international trade (per cent of current revenue)	Taxes on international trade include import duties, export duties, profits of export or import monopolies, exchange profits and exchange taxes.	World Bank (2006)
Capital account restrictions	Index based on two components: (i) Beginning with the year 2002, this sub-component is based on the question: "Foreign ownership of companies in your country is (1) rare, limited to minority stakes, and often prohibited in key sectors or (2) prevalent and encouraged". For earlier years, this sub-component was based on two questions about "Access of citizens to foreign capital markets and foreign access to domestic capital markets". (ii) Index based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions, including 13 different types of capital controls. It is constructed by subtracting the number of restrictions from 13 and multiplying the result by 10.	Gwartney and Lawson (2006)
<i>Index of social globalisation</i>		
<i>(i) Data on personal contact</i>		
Outgoing telephone traffic	Outgoing traffic refers to telephone traffic, measured in minutes per 1,000 people. (Minutes per subscriber, that originated in the country with a destination outside the country multiplied with number of telephone mainlines per 1,000 people.)	World Bank (2006)
Transfers (per cent of GDP)	Sum of gross inflows and gross outflows of goods, services, income or financial items without a quid pro quo. Data are in per cent of GDP.	World Bank (2006)
International tourism	Sum of arrivals and departures of international tourists as a share of population.	World Bank (2006)
Foreign population (per cent of total population)	Foreign population is the number of foreign or foreign-born residents in a country. Data are in per cent of total population.	World Bank (2006)
International letters (per capita)	Number of international letters sent and received per capita.	Universal Postal Union, Postal Statistics database, http://www.upu.int/

Variables	Definition	Source
<i>(ii) Data on information flows</i>		
Internet hosts (per 1,000 people)	Internet hosts per 1,000 people.	International Telecommunications Union (various years)
Internet users (per 1,000 people)	Internet users are people with access to the worldwide internet network.	World Bank (2006)
Cable television (per 1,000 people)	Cable television subscribers are households that subscribe to a multi-channel television service delivered by a fixed line connection, per 1,000 people. Some countries also report subscribers to pay television using wireless technology or those cabled to community antenna systems.	World Bank (2006)
Trade in newspapers (per cent of GDP)	The sum of exports and imports in newspapers and periodicals in per cent of GDP. Data are provided by the Statistical Division of the United Nations and correspond to those published in the U.N. World Trade Annual. Newspapers and periodicals correspond to code 892.2 of the Standard International Trade Classification (SITC).	UNESCO (various years)
Radios (per 1,000 people)	Radios refer to radio receivers in use for broadcasts to the general public, per 1,000 people.	World Bank (2006)
<i>(iii) Data on cultural globalisation</i>		
Number of McDonald's restaurants (per capita)	Number of McDonald's restaurants (per capita).	various sources
Number of Ikea outlets (per 1,000 capita)	Number of Ikea outlets (per 1,000 capita).	various sources
Trade in books (per cent of GDP)	The sum of exports and imports in books and pamphlets in per cent of GDP. Data are provided by the Statistical Division of the United Nations and correspond to those published in the U.N. World Trade Annual. Books and pamphlets correspond to code 892.11.	UNESCO (various years)
<i>Index of political globalisation</i>		
Embassies in country	Absolute number of embassies in a country.	Europa World Year-book, www.europaworld.com

Variables	Definition	Source
Membership in international organisations	Absolute number of international inter-governmental organisations.	Yearbook of international organisations and CIA World Fact Book, various years
Participation in U.N. Security Council missions	Absolute number of U.N. Security Council missions participated in.	Department of Peacekeeping Operations, UN
<i>KOF Index of Globalisation 2002 (additional variables)</i>		
Telephone average cost of call to U.S. (US\$ per three minutes)	Cost of international call to U.S. is the cost of a three-minute peak rate call from the country to the United States.	World Bank (2003)
Daily newspapers	Daily newspapers refer to those published at least four times a week, per 1,000 people.	World Bank (2003)
<i>Maastricht Globalisation Index</i>		
Embassies	The number of in-country embassies and high commissions measure the extent of diplomatic relations. The data are available for nearly all countries worldwide, but are corrected for country size, because very small countries often cannot justify the expense of many embassies and instead accredit one representative to service several countries.	Europa World Yearbook, www.europaworld.com
Organisations	Membership in international organisations proxy the international relations and involvement of a country. Since these memberships do not necessarily entail the need to maintain expensive representations abroad, this measure is less dependent on the size of the country.	CIA World Fact Book, www.cia.gov
Military	The military indicator measures the involvement of a country's "military-industrial complex" with the rest of the world. To make the data internationally comparable, a country's trade in conventional arms is correlated with its military expenditure.	Stockholm International Peace Research Institute, www.sipri.org

Variables	Definition	Source
Trade	Trade intensity is the sum of a country's exports and imports of goods and services measured as a share of GDP.	World Bank (2003)
FDI	Gross FDI is the sum of the absolute values of inflows and outflows of foreign direct investment recorded in the balance of payments financial account. It includes equity capital, reinvestment of earnings, other long-term capital and short-term capital.	World Bank (2003)
Capital	Gross private capital flows (as percentage of GDP) is the sum of the absolute values of direct, portfolio and other investment inflows and outflows recorded in the balance of payments financial account, excluding changes in the assets and liabilities of monetary authorities and general government.	World Bank (2003)
Migrants	As immigration and naturalisation policies vary widely internationally and illegal immigration is widespread, the share of foreign-born residents in a country is used to measure the intensity of migration.	www.unpopulations.org
Tourism	The sum of international inbound and outbound tourists, i.e. the number of visitors who travel to a country other than that where they have their usual residence for a period not exceeding one year and whose main purpose in visiting is other than an activity remunerated from within the country visited.	World Culture Reports www.unesco.org
Phone	International telephone traffic is defined as the sum of incoming and outgoing phone calls for a country, measured in minutes per capita.	International Telecommunication Union www.itu.int
Internet	The share of a country's population that uses the internet.	International Telecommunication Union www.itu.int

Variables	Definition	Source
Eco	Ecological footprint contains many environmental components, since production and trade of these kinds of goods are summarised by single measure. An ecological deficit (a footprint greater than bio-capacity) indicates that a country must either “import space” from somewhere (or stop “exporting” it) or face rapid ecological degradation. Similarly, an ecological surplus offers opportunities to “export space” by trade in space-intensive goods and services.	Living Planet Reports www.panda.org
<i>Government spending and taxation and the state of the Welfare State</i>		
Government expenditure, total	General government final consumption expenditure (per cent of GDP).	World Bank (2006)
Government expenditure, social	Public social expenditure (per cent of GDP).	OECD (2003)
Effective tax rates on labour, consumption and capital	Actual revenue in relation to tax base.	Carey and Rabesona (2002), Volkerink and de Haan (2001)
Age dependency ratio	Dependents to working-age population.	World Bank (2006)
Unemployment	Total unemployment in per cent of total labour force.	World Bank (2006)
Government employment	General government employment (producers of government services) as a per cent of working age population.	Cusack (1998)
Government left-wing	Dummy with the value 1 if chief executive is from a left-wing party and zero otherwise.	Beck et al. (2001)
GDP p.c. growth	Real GDP growth in per cent.	World Bank (2006)
Costs of trade	Value of imports c.i.f. relative to value of imports f.o.b.	IMF (2003)
<i>The composition of government spending</i>		
Capital expenditure	Capital expenditure is spending to acquire fixed capital assets, land, intangible assets, government stocks, and non-military, non-financial assets. Also included are capital grants. Data are shown for central government only and are shown in per cent of total expenditure.	World Bank (2006)

Variables	Definition	Source
Goods and services expenditure	Goods and services include all government payments in exchange for goods and services, whether in the form of wages and salaries to employees or other purchases of goods and services. Data are shown for central government only and are in per cent of total expenditure.	World Bank (2006)
Interest payments	Interest payments are payments made to domestic sectors and to non-residents for the use of borrowed money. (Repayment of principal is shown as a financing item, and commission charges are shown as purchases of services.) Interest payments do not include payments by government as guarantor or surety of interest on the defaulted debts of others, which are classified as government lending. Data are for central government only and are in per cent of total expenditure.	World Bank (2006)
Subsidies and other current transfers	Subsidies and other current transfers include all unrequited, non-repayable transfers on current account to private and public enterprises and the cost of covering the cash operating deficits of departmental enterprise sales to the public by departmental enterprises. Data are for central government only and in per cent of total expenditure.	World Bank (2006)
Central govt. exp.	Total expenditure includes both current and capital expenditures. It does not include government lending or repayments to the government or government acquisition of equity for public purposes. Data are for central government only and are in per cent of GDP.	World Bank (2006)
Inflation	Growth in GDP deflator.	World Bank (2006)
Interest rate	Lending interest rate is the rate charged by banks on loans to prime customers.	World Bank (2006)
GDP growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 1995 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes; minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for the depletion and degradation of natural resources.	World Bank (2006)

Variables	Definition	Source
Age dependency	Age dependency ratio is the ratio of dependents – people younger than 15 and older than 64 – to the working-age population aged 15– 64.	World Bank (2006)
Central govt. debt	Total debt is the entire stock of direct, government, fixed term contractual obligations to others outstanding at a particular date. It includes domestic debt (such as debt held by monetary authorities, deposit money banks, non-financial public enterprises and households) and foreign debt (such as debt to international development institutions and foreign governments). It is the gross amount of government liabilities not reduced by the amount of government claims against others. Because debt is a stock rather than a flow, it is measured at a given date, usually the last day of the fiscal year. Data are for central government only and in per cent of GDP.	World Bank (2006)
<i>Does globalisation spur economic growth?</i>		
GDP per capita growth	Annual percentage growth rate of GDP per capita based on constant local currency.	World Bank (2006)
Log (GDP p.c.), end of period	GDP per capita is gross domestic product divided by midyear population. Data are for the end of each five-year period.	World Bank (2006)
Secondary school enrolment	Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Secondary education completes the provision of basic education that began at the primary level.	World Bank (2006)
Rule of law	Measures the quality of the legal system and property rights.	Gwartney and Lawson (2006)
Log (life expectancy)	Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.	World Bank (2006)
Log (fertility rate)	Represents the number of children that would be born to a woman if she were to live to the end of her child-bearing years and bear children in accord with prevailing age-specific fertility rates.	World Bank (2006)

Variables	Definition	Source
Investment (in per cent of GDP)	Gross domestic investment.	World Bank (2006)
Government consumption (in per cent of GDP)	All government current expenditures for purchases of goods and services (including compensation of employees).	World Bank (2006)
Inflation rate	Measured by the consumer price index. The Laspeyres formula is generally used.	World Bank (2006)
Liquid liabilities	Liquid liabilities to GDP equal currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP.	Beck et al. (1999)
Stock market capitalisation	Equals the value of listed shares divided by GDP.	Beck et al. (1999)
Political rights	Rates political rights with 1 representing the most free and 7 the least free.	Freedom House (2000)
Civil liberties	Rates civil liberties with 1 representing the most free and 7 the least free.	Freedom House (2000)
Democracy, index	0–10 (0 = low; 10 = high) democracy score. Measures the general openness of political institutions.	Marshall and Jaggers (2003)
Overall budget balance (in percent of GDP)	Includes grants.	World Bank (2006)
Political instability	Index constructed using principal components analysis. The weights obtained for the components are 0.08 (assassination), 0.1 (strikes), 0.25 (guerrilla warfare), 0.15 (crisis), 0.16 (riots) and 0.27 (revolutions).	Easterly (2001)
Inequality	Use definition from below (next page): "Earnings inequality measured using Theil's T-statistic. ... is the income of person p and μ is average income."	University of Texas Inequality Project (UTIP)
<i>Globalisation and deunionisation</i>		
Union density	Union density is measured by the total union membership (less self-employed) weighted by the total dependent workforce.	Ebbinghaus and Visser (2000) for European countries. Golden and Londregan (1998) for Australia, Canada, Japan and the United States
Population density	Population density is mid-year population divided by land area in square kilometres. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship, except for refugees not permanently settled in the country of asylum, which are generally considered part of the population of their country of origin.	World Bank (2006)

Variables	Definition	Source
Government left-wing	Dummy with the value 1 if chief executive is from a left wing party and zero otherwise.	Beck et al. (2001)
Unemployment	Unemployment rate in per cent.	OECD (2001)
Inflation rate	Inflation as measured by the CPI reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services.	OECD (2001)
Industrial employment to total labour	Calculated as the ratio of industrial employment to the total labour force.	OECD (2001)
Ghent, dummy	Dummy variable that equals 1 for Belgium, Denmark, Finland and Sweden; and equals 0 for the other countries in our data set.	
Anglo, dummy	Dummy that equals one for Australia, Canada, Ireland, United Kingdom and United States; and equals 0 for all other countries.	
<i>Globalisation and inequality</i>		
Industrial payments inequality (log)	Earnings inequality measured using Theil's T-statistic. The T-statistic is given by $T = \sum_{p=1}^n \left\{ \left(\frac{1}{n} \right) * \left(\frac{y_p}{\mu_y} \right) * \ln \left(\frac{y_p}{\mu_y} \right) \right\},$ where n is the number of individuals in the population, y_p is the income of person p and μ_y is average income.	University of Texas Inequality Project (UTIP)
Household income inequality (log)	Derived from the econometric relationship between industrial payments inequality, other conditioning variables, and the World Bank's Deininger and Squire data set.	University of Texas Inequality Project (UTIP)
Democracy, index	Measures the general openness of political institutions on the scale 0-10 (0 = low; 10 = high).	Marshall and Jagers (2003)
GDP per capita	Measured in constant 2000 US\$.	World Bank (2006)
<i>Globalisation and the natural environment</i>		
CO ₂	Carbon dioxide in logarithm of metric tons per capita.	World Bank (2005)
SO ₂	Sulphur dioxide in logarithm of metric tons per capita.	Stern (2005)
BOD	Biochemical oxygen demand in logarithm of emissions in kilograms per day and per capita.	World Bank (2005)

Variables	Definition	Source
Round wood	Round-wood production in logarithm of thousand cubic meters per capita.	FAO (2004)
Environmental sustainability, index	Composite index tracking a diverse set of socioeconomic, environmental, and institutional indicators that characterise and influence environmental sustainability at the national level.	Esty et al. (2005)
(Log) GDP p.c.	GDP per capita in constant 2000 US\$.	World Bank (2006)
Dictatorship, dummy	Takes the value one for scores smaller than three on the Polity index of democracy; zero otherwise.	Marshall and Jaggers (2003)
Manufacture, value added	Manufacturing value added in per cent of GDP.	World Bank (2006)
Fertiliser (per hectare)	Fertiliser consumption in 100 grams per hectare of arable land.	World Bank (2006)
Population density	Population density in people per square kilometre.	World Bank (2006)
Urbanisation	Urban population in per cent of total population.	World Bank (2006)
Government left-wing, dummy	Dummy with the value 1 if chief executive is from a left-wing party and zero otherwise.	Beck et al. (2001)

APPENDIX B: DESCRIPTIVE STATISTICS

Variables	Mean	Std. Dev.	Min	Max
KOF Index of Globalisation 2007	43.63	18.2	8.24	92.21
Index of economic globalisation	49.74	19.84	8.34	97.11
(i) Data on actual Flows	49.92	21.26	5.52	99.83
Trade (per cent of GDP)	68.55	39.52	1.53	288.75
FDI, flows (per cent of GDP)	3.18	26.93	-28.62	1152.22
FDI, stocks (per cent of GDP)	27.89	42.57	0	1130.77
Portfolio investment (per cent of GDP)	46.87	74.16	0.01	933.82
Income payments to foreign nationals (per cent of GDP)	6.33	15.26	0	273.81
(ii) Data on restrictions	50.8	22.83	6.86	95.91
Hidden import barriers	6.11	1.65	1.83	9.69
Mean Tariff Rate	7.13	2.27	0	10
Taxes on international trade (per cent of current revenue)	13.43	12.86	0	64.66
Capital account restrictions	3.74	3.3	0	10
Index of social globalisation	37.24	20.75	1.95	92.55
(i) Data on personal contact	48.53	21.08	5.96	97.39
Outgoing telephone traffic	198.12	1636.1	0.41	83134.59
Transfers (per cent of GDP)	0.06	0.07	0	2.16
International tourism	0.78	0.98	0	8.11
Foreign population (per cent of total population)	6.73	10.99	0.03	75.03
International letters (per capita)	13.33	27.16	0.03	275.39
(ii) Data on information flows	39.53	24.13	1.14	97.49
Internet hosts (per 1,000 people)	3.95	25.88	0	656.94

Variables	Mean	Std. Dev.	Min	Max
Internet users (per 1,000 people)	71.04	136.04	0	787.98
Cable television (per 1,000 people)	60.85	99.84	0	1467.7
Trade in newspapers (per cent of GDP)	0.0005	0.0005	0	0.003
Radios (per 1,000 people)	371.51	343.98	0.26	3323.73
(iii) Data on cultural globalisation	27.14	26.51	1	96.94
Number of McDonald's restaurants (per 1000 capita)	0.2	0.57	0	4.68
Number of Ikea outlets (per million capita)	0.0633	0.32	0	4.33
Trade in books (per cent of GDP)	0.001	0.001	0	0.015
Index of political globalisation	46.36	25	1	98.53
Embassies in country	52.05	36.5	0	190
Membership in international organisations	49.18	17.09	0	369
Participation in U.N. Security Council missions	1.51	2.63	0	16
KOF Index of Globalisation 2002	2.46	1.26	0.21	6.48
Economic Globalisation 2002	3.31	1.65	0	8.84
Social Globalisation 2002	1.23	1.28	0.01	6.56
Political Globalisation 2002	3.08	1.81	0	8.58
Maastricht Globalisation Index	0.23	0.10	0.09	0.57
Embassies	53.52	37.35	6	172
Organisations	128.85	388.57	32	2000
Military	0.08	0.15	0	0.82
Trade	75.49	34.82	18.42	218.26
FDI	5.43	5.36	0.01	24.62
Capital	18.56	20.18	0.46	159.56
Migrants	6.14	9.1	0	57.9
Tourism	50.44	68.74	0.2	376
Phone	71.01	106.39	0.6	602.4

Variables	Mean	Std. Dev.	Min	Max
Internet	5.64	9.4	0.02	44.84
Eco	-0.2	3.74	-26.57	7.35
Government spending and taxation and the state of the Welfare State				
Government expenditure, total	16.65	7.23	2.34	58.31
Government expenditure, social	20.19	7.05	2	34.5
Effective tax rates on labour	30.8	9.64	3.33	53.33
Effective tax rates on consumption	16.81	5.24	6.18	28.1
Effective tax rates on capital	26.9	7.78	8.16	48.55
Age dependency ratio	0.74	0.2	0.32	1.18
Unemployment	9.52	6.57	0.3	43.5
Government employment	10.62	5.39	0.33	31.84
Government left-wing	0.28	0.45	0	1
GDP p.c. growth	1.58	4.45	-42.27	32.55
Costs of trade	-1	0.22	-1.28	0
The composition of government spending				
Goods and services expenditure	42.82	16.84	9.06	100
Capital expenditure	18.31	12.28	0.57	68.01
Interest payments	9.36	8.05	0	77.52
Subsidies and other current transfers	30.17	20.97	0.11	89.85
Central govt. expenditure	28.56	14.95	0.08	212.09
Inflation	0.87	2.44	-17.58	146.29
Interest rate	22.93	102.9	1.26	4774.53
GDP growth	11.66	16.65	-126.37	99.63
Age dependency	41.8	6.53	10.15	55.38
Central govt. debt	47.99	44.65	0.39	534.68
Does globalisation spur economic growth?				
GDP per capita growth	1.58	4.45	-42.27	32.55
Log (GDP p.c.), beginning of period	8.4	1.11	6.15	10.96
Secondary school enrolment	74.51	23.48	3.75	114.79
Rule of law	5.34	1.93	1.1	9.34
Log (life expectancy)	4.13	0.19	3.3	4.4

Variables	Mean	Std. Dev.	Min	Max
Log (fertility rate)	1.27	0.54	-0.13	2.14
Investment (percentage of GDP)	22.98	8.28	3.58	86.79
Government consumption (percentage of GDP)	16.65	7.23	2.34	58.31
Inflation rate	0.87	1.04	-4.71	29.73
Liquid liabilities	0.43	0.31	0	2.39
Stock market capitalisation	0.35	0.47	0	3.71
Political rights	3.94	2.2	1	7
Civil liberties	3.91	1.91	1	7
Democracy, index	0.24	7.49	-10	10
Overall budget balance	2.32	67.49	-68.27	1084.77
Political instability	0.2	0.33	0	3.34
Inequality	42.29	7.31	20.28	59
Globalisation and deunionisation				
Union density	-0.26	0.77	-1.7	1.7
Population density	137.01	380.08	0.14	6192.75
Government left-wing	0.28	0.45	0	1
Unemployment	9.52	6.57	0.3	43.5
Inflation rate	0.87	1.04	-4.71	29.73
Industrial employment to total labour	27.4	4.82	20.07	39.06
Ghent, dummy	0.02	0.14	0	1
Anglo, dummy	0.02	0.15	0	1

Variables	Mean	Std. Dev.	Min	Max
Globalisation and inequality				
Industrial payments inequality (log)	-3.25	0.96	-6.41	-0.67
Household income inequality (log)	3.73	0.19	3.01	4.08
Democracy, index	3.93	4.23	0	10
GDP per capita	7869.56	8159.32	488.16	59880.2
GDP per capita (squared)	129000000	252000000	238620	3590000000
Globalisation and the natural environment				
CO ₂	0.32	1.8	-4.61	5.04
SO ₂	-4.96	1.63	-12.28	0.59
BOD	-5.41	1.11	-9.62	-3.37
Round wood	-7.57	1.37	-13.8	-4.56
Environmental sustainability, index	50	8.36	29.2	75.1
(Log) GDP p.c.	7.49	1.55	3.8	10.75
(Log) squared GDP p.c.	58.47	23.62	14.43	115.49
Dictatorship, dummy	0.35	0.46	0	1
Manufacture, value added	15.08	8.3	0.19	45.97
Fertiliser (per hectare)	1583.23	4129.68	0.38	56000
Population density	251.56	1287.05	0.14	20523.81
Urbanisation	48.93	24.76	2.39	100
Government left-wing, dummy	0.28	0.45	0	1

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