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THE RELATIONSHIP BETWEEN INCOME INEQUALITY, POVERTY AND GLOBALISATION*

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ABSTRACT

This paper introduces two composite indices of globalisation. The first is based on the Kearney/Foreign Policy magazine and the second is obtained from principal component analysis. They indicate the level of globalisation and show how globalisation has developed over time for different countries. The indices are composed of four components: economic integration, personal contact, technology and political engagement, each generated from a number of indicators. A breakdown of the index into major components provides possibilities to identify sources of globalisation at the country level and associate it with economic policy measures. The empirical results show that a low rank in the globalisation process is due to political and personal factors with limited possibility for the developing countries to affect. The high ranked developed countries share similar patterns in distribution of various components. The indices were also used in a regression analysis to study the causal relationships between income inequality, poverty and globalisation. Inequality is negatively correlated to globalisation, and globalisation reduces poverty.

Keywords: globalisation, income inequality, poverty, indices, principal component

JEL classification: C23, D63, F15, O57

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1. INTRODUCTION

Globalisation[1] has become a way to describe changes in international economy and in world politics. It is defined as the free movement of goods, services, labour and capital across borders. Globalisation is a result of reduced transportation and communication costs, lower trade barriers, faster communication, rising capital flows, increased competition, standardization, and migration to mention a few key causal factors. The process has brought the developed economies closer together and made them more strongly interrelated. In the new era of growing integration of economies and societies, individuals and corporations reach around the world further, faster, and more economically than before. This subjects states and individuals to more intense developed market forces by causing rapid changes in trade relations, financial flows, and the mobility of labour across the world. However, there is a large heterogeneity in the degree of the process of globalisation over time and across countries and regions and also within countries. This heterogeneity causes disparity in development, especially in the negative effects such as rising inequality within and between countries, and urges the need to find the sources of disparity and the quantification of its magnitude and impacts on the living conditions of the world population.

In recent years, theoretical research on the link between globalisation and world inequality and poverty has been intense. However, analysis of the link at the empirical level is scarce. Globalisation generally is expected to reduce poverty through faster growth in more integrated economies. Extensive empirical research on the causal connections between globalisation and inequality in developing nations during the pre-globalisation phase show that there is no structural relationship between growth and inequality, and income inequality levels were generally immobile and trendless. Despite the great importance that in recent decade is placed on the globalisation process, its sources and consequences remain poorly understood. The channels through which globalisation affect world inequality have been identified as commodity price equalisation, factor price convergence, capital mobility and differentials in marginal products and rates of return of capital among countries, and dynamic convergence in per capita income growth.

The objective of this study is to investigate the usefulness of two indices of globalisation (Kearney and principal component analysis based) to compare a large sample of industrialised, transition and developing countries by their integration in the world economy. The two indices each are based on the countries' economic integration, personal contact, technology and political engagement. A decomposition of the indices into underlying components quantifies the individual factors' contribution to the integration. In addition to investigating the international level of globalisation, the indices are used for between and within region comparisons. The indices are expected to serve as useful tools in the evaluation of the impact of globalisation on the welfare of nations and regions. They are used in regression analysis to study the causal relationship between income inequality, poverty and globalisation.

Rest of the paper is organised as follows. In Section 2 the literature on different perspectives on globalisation, the links between globalisation and inequality and poverty, and measures to reduce its negative impacts is reviewed. In Section 3 the

[1] Sklair (1999) and Woods (1998) discuss competing conceptions, main approaches to, definitions, debates and implications of globalization.

Kearney and principal component composite indices of globalisation is introduced. The data is described in Section 4. Results on variations in the two globalisation indices, ranking of countries and regions by degrees of globalisation and development of globalisations over time is discussed in Section 5. Results from regression analyses of the impacts of globalisation on income inequality and poverty are discussed in Section 6 and 7, respectively. Section 8 summarises the findings.

2. A REVIEW OF THE LITERATURE

Waves of globalisation and its links

Globalisation has its roots in the second half of the eighteenth century. The period 1870 to 2000 is classified into: the first wave of globalisation 1870-1913, the de-globalisation period of 1913-1950, the golden age of 1950-1973, and the second wave of globalisation of 1973 onwards (see O'Rourke and Williamson 2000¸ O'Rourke 2001; Maddison 2001; Williamson 2002; and World Bank Development Research Group 2002). The empirical evidence shows that during the first wave of globalisation convergence in per capita income and real wages took place within the Atlantic economy. The de-globalisation period is characterized as a widening disparity between the richest and the poorest regions, and within the Atlantic economy. The golden age was a period of rapid growth, relative stability and declining inequality. For more details see Solimano (2001).

A literature on various aspects of the recent wave of globalisation is developing. Several special issues on globalisation have been published in Oxford Development Studies, Journal of World-Systems Research and Journal of African Economies. Editorial introduction to these special issues are provided by Woods (1998), Manning (1999), Bata and Bergesen (2002a, 2002b), and Bevan and Fosu (2003). In addition, a number of books on the issue have been published by the academic press. Dollar and Collier (2001) and the World Bank Development Research Group (2002) explored the relationship between globalisation, growth and poverty; James (2002) analysed technology, globalisation and poverty, while Aghion and Williamson (1998) examined the relationship between globalisation, growth and inequality, focusing on history and policies. Khan and Riskin (2001) studied the globalisation, growth, inequality and poverty issues but limited their study to the development in China. O'Rourke and Williamson (2000) look at the evolution of the 19th century Atlantic economy, and Tousch and Herrmann (2002) analysed globalisation and European integration.

The links between globalisation and inequality

In recent years, research on the link between globalisation and world inequality has been intense. Economic growth has often been given priority as an anti-poverty measure, while the negative links between growth and inequality have been largely ignored by policy makers. Cornia and Court (2001), in a policy brief covering the second wave of globalisation, highlight five main issues. First, inequality has risen since the early-mid 1980s. Second, the traditional common factors causing inequality, such as land concentration, urban bias and inequality in education, are not responsible for worsening the situation. Third, the persistence of inequality at high levels makes poverty reduction difficult. Fourth, a high level of inequality can depress the rate of growth and have undesirable political and social impacts (see also Birdsall, 2000). Fifth,

developments in Canada and Taiwan show that low inequality can be maintained at a fast growth rate.

The non-traditional new causes of inequality are identified as liberal economic policy regimes and the way in which economic reform policies have been carried out. Land reform, expanding education and active regional policy are recommended as measures to reduce inequality. The new development approach called the 'Post-Washington Consensus' (Stiglitz, 1998) includes measures to offset the impacts of new technologies and trade, macroeconomic stability, careful financial liberalization and regulation, equitable labour market policies, and innovative tax and transfer policies.

In their studies of the link between globalisation and inequality, Lindert and Williamson (2001) and O'Rourke (2001) state that increased world inequality has been driven by between-country rather than within-country inequality. It follows that globalisation will have very different implications for within-country inequality. The direction of impact on within-country inequality depends on the participating country's policy to exploit it. The source of within-country inequality could be poor government and non-democracy in lagging countries, not globalisation.[2] Lindert and Williamson (2001) classified the influence of globalisation on inequality in five conclusions. First, the widening income gaps between countries that integrated into the world economy have probably been reduced. Second, within labour-abundant countries, emigration and opening up to international trade before 1914 lowered inequality. Third, within labour-scarce countries, immigration and opening up to international trade raised inequality. Fourth, accounting for all international and intra-national effects, more globalisation has reduced inequality. Fifth, inequality is lower under integration of countries and economies than under segmentation.

Talbot (2002), in view of the unequal exchange in the world system, argues that a new international inequality exists that has been superimposed on the old form of international inequality, which explains increasing global inequality. Talbot refers to the case of coffee production and trans-national corporations' control over the capital. Bata and Bergesen (2002) summarize that the increasing international inequality was one of the most important consequences of the nineteenth century globalisation. They further state that research into the cause of increasing inequalities is important; understanding how the world-system works and the consequences of globalisation in the twentieth century is necessary in order to change it. Babones (2002) find increasing between-nation inequality since mid twentieth century. Beer and Boswell (2002) link increased within-nation inequality to greater dependency on foreign investment. Ciccantell and Bunker (2002) argue for reorganization of the world-system in support of Japanese developments such as organization and technological innovations in the steel industry. Bornschier (2002) noted stable inequality until 1972, but increasing both within- and between-nation inequality until the end of the century. Bergesen and Bata (2002) find that within- and between-nation inequality change together over time among core countries, but they are unrelated among non-core countries.

[2] See also Aghion and Williamson (1998) on the link between wage and income inequality and growth in developed economies.

The link between globalisation and poverty

Agénor (2003) examines the extent to which globalisation affects the poor in developing countries. The focus is on the channels through which trade openness and financial integration may have adverse effect on poverty. Cross-country regression analysis relates globalisation to poverty and control for various macroeconomic and structural variables. Results suggest evidence of an inverted U-shape relationship between globalisation and poverty indicating that globalisation at low (higher) levels tends to increase (reduce) poverty. Collier and Dollar (2001) estimate that poverty in the developing countries will decline by about one-half by 2015. The reduction is conditional on the 1990s trend to holds, improved aid effectiveness in lagging regions, the quality of economic policy, and significant policy reforms in these countries to create a better environment for poverty reduction and effective aid. Inefficiency in aid makes achievements of the poverty reduction goals uncertain. In a comparison of actual aid allocation and poverty-efficient aid allocation Collier and Dollar (2002) found that the level of poverty and quality of policies matter. The results are not sensitive to poverty measures, but the authors find a systematic difference between the actual and poverty-efficient aid allocations.

The World Bank Development Research group (2002) focuses on the impact of economic integration on the poor people living in developing countries. Three main findings linked to the debates about globalisation are presented. First, poor countries like China, India, Bangladesh and Vietnam, which were early exporters of primary commodities, have broken into the global market for manufacturing and services, lowering their poverty. Second, efforts have increased to include countries like Afghanistan and Congo into the world economy. Third, standardization or cultural and institutional homogenization result from the economic integration. In sum, the economic integration has supported poverty reduction, but inclusiveness should be improved to not bypass marginalized and new globaliser countries (see also Dollar and Collier (2001) and Khan and Riskin (2001)). The World Bank Development Research Group presents a seven-point plan to help developing countries take better advantage of the benefits of globalisation and manage the risks associated with their integration into the world economy.[3]

Yusuf (2003) lists a number of factors as a source of growth relevant to both poor and rich countries. These are labour, human capital, research and development investment, technological progress and increase in total factor productivity rising from scale economies, agglomeration effects, externalities and institutions that secure rights and minimise transaction costs. Increase in welfare in developing countries will depend on their policies addressing these variables. Concerning globalisation in Africa, Ajayi (2003) reaches the conclusion that integration into the global economy alone does not enhance growth, but also maintenance of macroeconomic stability, high investment/GDP ratios and development of human capital, infrastructure and

[3] The seven-point plan are: (i) a 'Development Round' of trade talks to bring down the trade barriers, (ii) improving the investment climate in developing countries to encourage inflows of foreign direct investment, (iii) improving delivery of education and health services to enable the poor to benefit from growth, (iv) provide social protection to a changing labour market to enable workers to take more risks and to avail themselves of new opportunities, (v) rich nations should increase foreign aid with impact on growth and poverty, (vi) support debt relief for reforms in marginalized countries, and (vii) tackling greenhouse gases which has been burdensome to poor countries and poor people.

institutions are also necessary. Mussa (2003) gives an overview of the challenges posed to the international community by globalisation with emphasis on the economic issues of the distribution of benefits accruing from increased trade and the reduction of the effects of instabilities in international capital flows.

Different perspectives on globalisation

Globalisation has other dimensions than inequality and poverty with different impacts and can be looked at from different perspectives. James (2002) analyses the causes of globalisation in terms of transaction costs and focuses on information and communication technologies as well as technical change and foreign investment deriving from globalisation and their application to developing problems in Africa. Bhagwati (2000) focuses on trade and foreign direct investment. Appropriate governance is needed to manage globalisation and the speed at which it must be pursued. La Porta et al.'s (1999) examination shows that from the perspective of promoting development the performance and quality of government across countries varies in systematic ways. Milanovic (2002) show that the effects of openness on income distribution depend on the country's initial income level. Seshanna and Decornez (2003) find that during the last 40 years the world economy has become wealthier, more globally integrated, but unequal and polarized. Mahler (2001) found little evidence of a systematic relationship between any of the three main modes of economic globalisation (trade, foreign direct investment and financial openness) and either the distribution of disposable income or earnings of households in developed countries.

Several studies address the wage links between globalisation and inequality within a country. The effects of globalisation on skill premium, unemployment, and countries' social policies are addressed by Ethier (2002). Empirical literature concludes that trade has played a smaller role in the rise of skill premium than skill-biased technical change. Miller (2001) demonstrates that globalisation explains a significant increase in earnings inequality from declining relative wages of unskilled workers in the US since the late 1970s. Eckel (2003) shows that changes in relative wages are independent of wage rigidities, but wage inequality is affected by capital market integration. Manasse and Turrini (2001) study the effects of globalisation on income inequality by looking at trade integration. Globalisation, although improving welfare, is likely to raise inequality. Redistribution, rather than protection, should be the appropriate measure to avoid a rise in inequality.

Measures to reduce negative impacts of globalisation

Countries could use a number of measures to reduce the negative impacts of the rapid globalisation process. The current system is incapable of dealing with the surfacing problems. Nayyar and Court (2002) identify the main ways in which the governance needs of the world economy and policy can be strengthened. A new structure of governance, reforms and new institutions are proposed to better protect the interests of poorer developing countries. Addison and Rahman (2002) identify geographical characteristics, institutional and political factors, economic policy and histories that matter for an individual country's capacity to globalize. Bordo et al. (1999) conclude that commercial and financial integration before the First World War was more limited but trade tensions and financial instability have not worsened in recent years; institutional innovations and their stabilizing role explain this. Regarding the

importance of institutional capacity for globalisation and openness Chirathivat and Murshed (2001) argue that domestic institutional capacities in Southeast Asia were inadequate to cope with the influx of capital necessary to prevent the recent Asian economic crisis.

Recent literature on economic geography considers globalisation as the catalyst for structural change (Peri, 2002). Decreases in transport costs trigger the emergence of agglomeration economies and a source of within country inequality. Transportation plays a dualistic role as a pro-active agent of globalisation and as a beneficiary of its development. However, regional inequalities limit globalisation opportunities (Janelle and Beuthe, 1997). The growth of the information technology service sector (Zagler, 2003) affects productivity growth, and inequality within and between countries. Pieterse (2000) argues that globalisation involves a trend towards human integration. In line with Sen (2002) the concern in Ravallion (2003) is continuing deprivation and rising disparity in standards of living

There is a link between the type of export and inequality. Calderón and Chong (2001) find that primary export countries (developing) are associated with an increase in inequality, while manufacturing exporters (developed) are linked with decreasing inequality. Despite increasing inequality, Mayer (2001) finds that globalisation has improved access to new technologies and provides unique opportunities for poor countries to raise their incomes, however countries differ in technology upgrading and skill accumulation (see also Meyer, 1999).

Despite limitations in the existing literatures, a majority of empirical studies finds the positive impacts of integration overweigh the negative effects. In one of the few critical papers Sutcliffe and Glyn (1999) find globalisation widely misinterpreted and its quantitative extent and novelty exaggerated. They criticize the research on the basis of the use of inappropriate statistical measures, conclusions drawn from limited data, failure to make historical comparisons and failure to see counter-globalisation tendencies.

3. A COMPOSITE GLOBALISATION INDEX

Kearney (2002, 2003) is the first attempt to construct a database and to compute a composite globalisation index. The index is composed of four major components: economic integration, personal contact, technology, and political engagement, each generated from a number of determinant variables, in total 13. The globalisation index (KEARNEY) is based on normalization of individual variables and subsequent aggregation using an ad hoc weighting system as follows:

$$(1) \qquad KEARNEY_{it} = \sum_{j=1}^{J} \sum_{m=1}^{M} \omega_{jm} \{(X_{jmit} - X_{jmt}^{\min}) / (X_{jmt}^{\max} - X_{jmt}^{\min})\}$$

where i and t indicate country and time periods, m and j are within and between major component variables, ω_{jm} are the weights attached to each contributing X-variable, min and max are minimum and maximum values of respective variables across countries in a given year. The index is similar to a commonly used Human Development Index

(HDI) which is based on educational attainment, life expectancy and real GDP per capita.[4]

In calculation of the Kearney index, the component's weights are chosen on an ad hoc basis and are constant across countries and over time. We consider this index a benchmark index. In the basic index each of the 13 determinants of the index are given equal weight (w=1). In the alternative case, a number of variables were given double weights (w=2). Lockwood (2001) using a smaller set of countries found the ranking of countries sensitive to the way the indicators are measured, normalised and weighted.

There are two alternative approaches to the Kearney index to compute an index of globalisation. These are to use principal component (Heshmati 2003) or factor analysis (Andersen and Herbertsson, 2003).[5] In this paper we adopt the principal component (PC) approach.[6] PC analysis is a multivariate technique for examining relationships within a set of variables consisting of several quantitative variables. Recently, Agénor (2003) used trade and financial openness to compute a simple economic globalisation index based on PC analysis.

Given a dataset with p numeric variables, at most p principal components can be computed; each is a linear combination of the original variables with coefficients equal to the eigenvectors of the correlation of the covariance matrix. The principal components are sorted by descending order of the eigenvalues, which are equal to the variance of the components. PC analysis can be viewed as a way to uncover approximate linear dependencies among variables. This method gives a least square solution to the following model:

$$Y = XB + E \qquad (2)$$

where Y is an $n \times p$ matrix of the centered observed variables, X is the $n \times j$ matrix of scores of the first j principal components, B is a $j \times p$ matrix of eigenvectors, E is an $n \times p$ matrix of residuals, n is the number of observations, p is the number of partial variables, and j is the number of variables or indicators of globalisation. Here we minimize the sum of all the squared residuals, which are measured as distances from the point to the (first) principal axis. In the least squares case the vertical distance to the fitted line is minimized.

The globalisation indices indicate the level and state of inequality in globalisation among countries and regions. It shows how globalisation has developed for different

[4] For a review of the HDI, its components, criticisms on the index and alternative indices see Noorbakhsh (1998).

[5] The data underlying the two studies differ with respect to country coverage, period of observation and selected indicators of globalization. Heshmati (2003) is based on a panel data containing 13 indicators of globalization and 62 industrialised and developing countries observed during 1995-2000, while Anderson and Herbertsson (2003) uses data on 9 indicators from 23 OECD countries for the period 1979 to 2000.

[6] A PC procedure performs a PC analysis to produce standardized or unstandardised PC scores. A factor analysis (FA) performs PC and common FA with rotations to produce component scores or estimates of common factor scores. FA can be used for common factor analysis. The default method is PC. FA produces the same results as PC except that scoring coefficients from FA are normalized to give PC scores with unit variance. A comparison of results from application of the two methods based on the same data would shed lights on their strength and limitations. For a discussion of each method's advantages over the other, see SAS/STAT User's'Guide (SAS Institute 1993).

countries over time. A breakdown of the Kearney index into major components provides possibilities to identify sources of globalisation. For similar breakdown of the PC analysis index can be based on canonical correlation looking at the correlation relationship between two or more sets of variables. The indices as shown later can be used to study the causal relationship between globalisation and inequality, growth, poverty and wages.

4. THE DATA

The database created by Kearney/*Foreign Policy* magazine (2002, 2003)[7] is used for computation of the globalisation index. This data is a small balanced panel covering 62 countries observed for the period 1995-2000, and was originally collected from national sources and international organizations and financial institutions. The data variables on economic integration, personal contacts, technology, and political engagement are expected to proxy the channels through which globalisation affect economic growth, and world inequality and poverty.

The data on economic integration consists of four variables: trade, foreign direct investment, portfolio capital flows, and income payments and receipts. All four variables are given as a share of GDP. The trade variable includes total trade and is measured as the sum of goods and services. FDI is measured as an aggregate of in- and outflows of FDI. Portfolio flows is measured as the sum of portfolio inflows and outflows. Income payments and receipts include the compensation of non-resident employees and income earned and paid on assets held abroad.

The second component on personal contact consists of three variables: international telephone traffic, international travel and tourism, and transfer payments and receipts. The telephone traffic variable is defined as per capita sum of incoming and outgoing calls. The travel and tourism variable is defined as the sum of travellers in and out from a country as a share of its population. The receipts of transfers and payments is measured as the sum of in- and out-transfer payments as a share of GDP.

The technology component builds on three variables: internet users, internet hosts and secure internet servers. This component is very much internet specific and does not reflect technology in a broad meaning. The internet user variable is measured as a share of population, while internet hosts and secured servers are measured per capita.

The last component, political engagement, is based on three variables including the number of embassies in the country, number of memberships in international organizations, and number of UN Security Council missions undertaken during a calendar year.

The supplementary data include population and GDP variables used for normalisation purposes. A summary statistics of the variables is given in Table 1.

From Table 1 we observe large variations among variables underlying the calculation of the index and its components. The distribution of the index components (not reported here) is not uniform. This is particularly evident in the case of the technology

[7] The data sources can be viewed at web sites: www.foreignpolicy.com and www.atkearney.com.

component with large dispersion and with the sample mean significantly higher than the median. In the case of the political component the mean and median values overlap. The range of principal-component-based indices differs from those of Kearney-based indices.

Correlation coefficients among various index components are presented in Table 2. As expected, the various components are positively and mostly significantly correlated among themselves. The economic integration component is negatively correlated over time, while technology is positively correlated with time. The remaining personal and political components as well as the two Kearney globalisation indices are not correlated with time. Application of different weights does not change the rank of the countries much. The overall Kearney index is much dominated by political and economic integration. We have not decomposed the principal component index into its underlying four components. Such decomposition would require, first, the application of PC analysis on each component separately, and then the aggregation of the components into a single globalisation index, or, alternatively, the use of canonical correlation analysis.

5. VARIATIONS IN THE GLOBALISATION INDEX

The Kearney (1) and principal component (2) indices of globalisation are computed for each of the 62 countries and for six years of observation. A weighted principal component index is obtained by aggregating the first three principal components, where in the aggregation their normalised contribution to the explanation of the total variance explained is used as weights.[8] Following Kearney's approach a number of economic, personal and technology factors are given higher weights. For matters of sensitivity analysis the Kearney index as a benchmark model is computed with equal weights as well. The summary statistics of the index components are given at the bottom of Table 1.

Table 2 reports correlation coefficients among different index components and indices. The economic component is decreasing (-0.14) over time, while technology shows an increasing trend (0.12). The personal and economic components are highly correlated (0.59). Unlike the Kearney indices, the principal component indices indicate that globalisation process is increasing over time (0.24 and 0.29, respectively). The within group correlation among the two Kearney indices is high (0.99), as well as among the two PC indices (0.84). The between index group correlation coefficients are also quite high (0.77-0.88).

Ranking countries by globalisation

The mean of the four globalisation indices by country together with the period mean Gini coefficient and most recent years of Gini coefficient are reported in Table 3A. The countries are ranked in descending order of the first principal component index. However, for matters of comparison, the rank numbers by the weighted Kearney index are also given in the same table. The rank of countries by degree of globalisation differs somewhat by the computation method chosen. The transition in position of the least

[8] For the principal component analysis we identified three eigenvalues exceeding one; 4.5862, 2.6419 and 1.3622. The proportion of the total variance explained by these principal components are: 0.3528, 0.2032 and 0.1048. The cumulative proportion of total variance explained is 0.6608.

globalised countries is higher than that of the most globalised ones. Ideally one should report the transition steps over time for the selected index in the form of a transition matrix.

The results based on the first principal component show that Uganda, Iran and Morocco are ranked as the three least globalised countries compared to Ireland, Singapore and Switzerland which rank as the most globalised countries. Slovenia, Slovak republic and Nigeria are among the average globalised countries. Internal and external conflicts seem to effectively reduce the low ranked countries' globalisation process by affecting the economic and technology components negatively. The high ranked countries with few exceptions share similar patterns in the various components distribution. Several exceptions can be found, such as the Russian Federation. Russia is allocated a very high political factor which is crucial for its rank (34) and France ranked as 15 has also the highest political factor. The same is true in the case of China which despite its high political engagement is ranked only 44. The mean unweighted Kearney index decomposed into sub-components by country are reported in Figure 1. Mean of all four indices by country are shown in Figure 2. The position of countries with the exception of the weighted principal component index is very similar. The difference in the latter is due to normalization prior to aggregation of the three principal components. The three principal components are shifted such that the minimum values are 0 and the sum of variances used as weights in the aggregation add up to 1.

Ranking regions by globalisation

The mean globalisation by regions is presented in Table 3B and Figure 4. The ranking of regions differs depending on whether identical or different weighting system for the Kearney index is applied, or whether only the first principal component or a weighted index is used. As a result of attaching a higher weight to the technology factor, sub-Saharan Africa, with relative low technology component, switches its position in the favour of East Asia to a lower rank. Based on equal weights, the South Asian region is identified as the least globalised region. The low level of globalisation is very much determined by the absence of the technology factor. This picture is shared with the sub-Saharan African region. The ranking based on the first principal component is similar to that of the Kearney-based weighted index.

The Latin America and Middle East and North Africa regions are allocated a medium level of globalisation. However, they differ by index components. For instance, Latin America is advantageous in economic integration, while the Middle East and North Africa enjoy better personal contacts. In terms of political engagements they share, however, a very close position. The East Asian region shows a high economic integration and technology transfer, but its globalisation is limited by relatively low personal contacts and political engagements. The East European region shows progress in all four factors, but yet has low technology transfer. The West European[9] and South East Asian regions take the positions of the highest globalised economic and geographic regions. The economic integration for the South East Asian region is higher, while the remaining three components are higher in West European. We find large heterogeneity in globalisation among countries belonging to these two regions.

[9] In order to reduce the number of regions we have added Australia, Japan, USA, and Canada to the West European region. In continuation we use Western Europe and industrialized countries interchangeably.

Development of globalisation over time

The mean indices and their components for each year of observation from 1995 to 2000 are reported in Table 3C and Figure 3 which is based on the unweighted Kearney index. Ideally this should be weighted by the countries' share of GDP or population to provide a more accurate picture of the temporal changes in the global globalisation process. Despite the short period it yet provides a partial picture of the development of the globalisation index. In terms of total GDP produced, size of population and total trade the small sample of included countries provide a satisfactory coverage of globalisation.

The unweighted economic integration increased during 1995 to 1997 from 0.73 to 0.86. It declined sharply to 0.60 in 1998 and remained below this level until 2000. The two principal component indices continuously increased over time. These are preferred as they are not restricted by assumption of the same weights or arbitrarily chosen weights. The technology component continuously increased from 0.27 to 0.44. The political component is constant over time and as expected it does not change over a short period.

The average annual changes in index components and composite indices are reported in Table 3D. Here the changes are based on annual means neglecting the between country variation. The between country variation is quite high as a share of the total variation. Due to the increasing patterns of technology component and the principal component indices over time, their per cent changes over time are all positive.

A comparison with previous results

A number of factors distinguish this study from previous ones. First, unlike previous studies based only on trade proxy globalisation, our analysis is based on a general index of globalisation covering various aspects of changes in international economy and in world politics. It captures the free movements of goods, services, technology, labour, capital and politics across borders and over time resulting from lower transportation cost, lower trade barriers, faster communication technologies, competition and standardizations. Second, the time period is very short and covers only the last years of the second wave of globalisation. Third, the number of countries is also limited by data availability.

Despite the limitations in the form of country and time coverage, our results provide a clear picture of the heterogeneity in the process of globalisation over recent phase of globalisation, disparity in development and its impacts on rising inequality between and within countries and regions over time. Before turning to the regression analysis, we note that the results indicate that globalisation has reduced poverty through faster growth in several integrated economies. In our sample and period one can see a pattern that globalised countries experienced high growth and reduced poverty. However, inequality can be linked to poor governance, infrastructure and institutions, and taxes and redistribution policies in lagging countries rather than their fast growth and globalisation.

6. THE IMPACTS OF GLOBALISATION ON INCOME INEQUALITY

Specification of the relationship

Income inequality from a country perspective may depend on a number of internal and external factors. Globalisation is one such main external factor. The link between

globalisation, income inequality and growth has for years been the focus of much researcher attention. However, with the exception of a partial view in studies like Mahler (2001) and Agénor (2003) who looked at the relationship between inequality and the economic components (trade, FDI and financial openness) of globalisation, the lack of a globalisation index has not allowed statistical estimation and testing of the relationship. In this section we aim to address this by means of regression analysis:

$$(3) \qquad GINI_i = \alpha_0 + \alpha_1 GINDEX_i + \sum_{j=1}^{J} \gamma_j REGION_{ji} + u_i$$

where *GINI* and *GINDEX* refer to the Gini coefficient and globalisation index, *REGION* is a *J* vector of regional dummies, *u* an error term and the subscript *i* refers to a country. Since the two datasets, Kearney and WIID, do not overlap we were forced as a second best alternative to use a cross sectional approach in establishing the relationship. The Kearney database covers the period 1995-2000, while the WIID covers the period before 1998. The former is a balanced panel data of 62 countries, while in the latter 146 countries are observed non-consecutively on an irregular basis.

The Gini coefficient is a standard measure of income inequality. It is given as a mean of multiple observations for a given country in a given year. The multiplicity of observations is due to the different definitions of income, area coverage and units of measurement. It is defined here in two different ways. First, the most recent observation (1996 to 1998) is used in the cross sectional regression analysis. A number of countries (16) are observed prior to 1995. For the second definition instead of the last year of observation we use the mean Gini by country for all years that a country is observed. For summary statistics of the inequality variables see Table 1.

The globalisation index is defined in four different ways: the unweighted and weighted Kearney and principal component indices. In the unweighted Kearney case all 13 indicators are given identical weights (w=1). In order to avoid the strong assumption of equal weights, in the weighted Kearney case a number of factors are given double weights (w=2) on an ad hoc basis. The unequally weighted factors are foreign direct investment, portfolio investment, international telephone traffic and internet users. The unweighted principal component index is based on the first principal component of the same 13 indicators, while the weighted index is based on the weighted average of the first three principal components.

Correlation between globalisation, inequality and poverty

Correlation among the different unweighted components of the Kearney globalisation index, and different aggregate globalisation indices are reported in Table 4. Calculations here are based on cross-sectional data obtained as multiple periods means to be used in the regression analysis. The correlation coefficients and their significance are very similar to those based on non-averaged individual observation reported in Table 2. All coefficients are positive and significantly different from zero indicating positive within and between group correlation among the indices and their decomposition. An exception is insignificant correlation of the political component with economic and personal components. In general the correlation among the aggregate indices (0.82 to 0.99) is stronger than correlation among the index components (0.35 to 0.65). The between group components correlation varies in the interval 0.33 to 0.85.

Correlation among the income inequality, poverty and globalisation indices, based on over time mean values, are also reported in Table 4. The two Gini coefficients are highly correlated with each other (0.84). They are negatively correlated (-0.22 to –0.37) with the personal, technology and political components, but uncorrelated with the economic component. The same negative relationship holds between inequality and the aggregate globalisation indices (-0.28 to -0.33).

The poverty measures representing per cent of population below the national poverty line, below $1 and below $2 per day are positively correlated (0.45 to 0.83). However, none of these three poverty measures are correlated with the fourth measure based on the share of 20 per cent poorest of national income or consumption. The first three poverty measures are uncorrelated with inequality, while the last measure is negatively correlated (-0.76 to -0.85). Increased inequality is more disadvantageous to the poorest 20 per cent of population. Concerning correlation between our four poverty measures and four globalisation indices, results show that globalisation reduces poverty (-0.31 to 0.50) and increases (0.22 to 0.23) the poorest share of national income or consumption thereby also reducing inequality. The declining poverty is mostly associated with the technology component of globalisation. For more details see Table 4.

Estimation results

The estimation results from a regression of the Gini coefficient on the unweighted Kearney globalisation index, when Gini is defined as the most recent year of observation, are reported in Table 5A. Results based on an alternative definition where Gini is defined as mean income inequality over time are reported in Table 5B. Regression results from the two Gini measures on the unweighted (first) principal component measure of globalisation are presented in Table 5C. Results based on weighted first three principal components are not reported here due to limited spaces.

It is worth mentioning that, since we use cross sectional regression analysis, it has not been possible to identify unobservable country specific effects. However, in addition to the globalisation index we have added a number of dummy variables representing unobservable regional effects. These capture regional heterogeneity in income inequality.

For sensitivity analysis, a number of alternative specifications of the simple relationship (equation 3) are estimated. In the basic model in Table 5A (Model A1) variations in income inequality are explained by an aggregate unweighted Kearney globalisation index. The coefficient is negative and statistically highly significant. It indicates a negative relationship between the level of globalisation and income inequality. The same relationship applies when globalisation is differently weighted (Model A9). However, globalisation explains only 11 per cent of the variations in income inequality among the 60 countries.[10] This is in line with Lindert and Williamson (2001) who found the net impact of globalisation too small to explain the long-term rise in world inequality. The inclusion of the squared globalisation indices in Models A1 and A9 were insignificant indicating absence of Kuznets U-shaped relationship between inequality and globalisation.

[10] The income inequality variable for South Africa and Morocco is missing. These two countries are excluded from the regression analysis.

Results from a decomposition of the unweighted Kearney globalisation index into its four sub-components (Model A2 to A5) show that economic integration and political engagement do not individually explain any of the variations in income inequality.[11] However, simultaneous inclusion of the four components (Model A6) indicates that personal contacts and technology transfers reduce inequality, while economic integration increases inequality. Political engagement is found to have no significant effect. Personal contact is the single component contributing most to the explanation of inequality variations. To control for regional heterogeneity we added a number of regional dummies. Accounting for regional heterogeneity (Model A7) captures most variations in inequality among the countries. The explanatory power of the model increases from 0.11 to 0.64. Similar results are obtained when the globalisation index is weighted (Model A10). However, the globalisation index turns out to be insignificant. It should be noted that there is a risk that regional inequality and globalisation are correlated biasing the effects of globalisation on income inequality. This applies as well to the case where both sub-components of globalisation and regional effects are included (Model A8).

Regression results corresponding to Models A1 to A8, based on alternative definitions of income inequality, where mean Gini coefficient over time is used, are reported in Table 5B and labelled as Models B1 to B8. The signs of coefficients are not changed. However, their significance and sizes in a number of cases are changed. The regional variables play an even more important role in the explanation of variation in income inequality.

In Table 5C we present regression results on the link between income inequality defined in two different ways and globalisation computed using the first principal component method. As in the previous cases the results indicate a negative relationship between globalisation and income inequality. The squared globalisation index is positive and weakly significant (Models C2 and C5) indicating a U-shaped or declining negative relationship. The fit of the model is somewhat lower compared to the two Kearney based indices. Adding regional dummies to the relation (Models C3 and C6) produces similar results in terms of signs, significance and the size of effects. Again the globalisation index turns out to be insignificant when regional dummies are added to the model.

Our results are in line with Mahler (2001) who using Luxembourg Income Study data found little evidence of a systematic relationship between the three main modes of economic globalisation namely trade, outbound investment and financial openness and either the distribution of disposable personal income or earnings of households. The overall conclusion is that economic integration does not systematically lead to increased income inequality across entire economies.

It is to be noted that the results presented here are primary tentative. The results provide some initial support to the hypothesis of the existence of a (negative) relationship between inequality and globalisation but several essential improvements are still necessary to confirm this finding.

[11] Agénor (2003) found an inverted U-shape relationship between globalization and poverty. The index of globalization was based on trade and financial integration. The index is similar to our economic integration component.

Some guidelines

The index should take an axiomatic approach that sets out its desirable properties and provide a family of indexes that fulfil such properties. The index should fully quantify globalisation by including several other relevant components. These could include some measure of cost-benefit ratio of globalisation, impacts on standards of living, environmental aspects, wage inequality, skill biased technological change, the volume and directions of foreign trade and movements of skilled labour, and democracy and conflict, shift in power and aspects of cultural uniformity.

The direction of causality, simultaneity and bias due to omitted effects must be investigated. Non-linearity would also shed more light on the Kuznets inverted U-hypothesis about the inequality-globalisation relationship conditional on growth.

Industrialized countries dominate the current sample, with different relationships between development, redistribution and inequality than developing countries. The sample of countries should be expanded to include more developing and transition countries.

An identification of major determinants of globalisation and quantification of their effects on the ranking of countries are key issues based on which policy options could be provided. Analysis will help in identifying ways for a fair treatment of products, services and people that enables poor countries to benefit from globalisation to a greater extent.

7. THE IMPACTS OF GLOBALISATION ON POVERTY

Model specification

In several studies the relationship between globalisation and poverty is examined. Cornia and Court (2001) find that rising inequality threatens growth and poverty reduction targets and persistent poverty at high levels makes poverty reductions difficult. Results in Agénor (2003) suggest that at the low levels globalisation hurt the poor, but at higher levels it reduces poverty. Ravallion (2003) sees reducing inequalities in opportunities within the developing countries to be crucial to realize the poverty-reducing potential of globalisation. Globalisation is one external factor that might affect the earnings, distribution of income and poverty. In this section we aim to address the link between globalisation and poverty by the means of regression analysis:

$$(4) \qquad POVERTY_i = \lambda_0 + \lambda_1 GINDEX_i + \sum_{j=1}^{J} \eta_j REGION_{ji} + v_i$$

where *GINDEX* refer to globalisation index, *REGION* is a vector of regional dummies, *v* an error term and the subscript *i* refers to a country.

The poverty data are prepared by the World Bank's Development Research Group (http://wwww.worldbank.org/) and Human Development Report 2003 (2003). The *POVERTY* variable is defined in four different ways: per cent population below the national poverty line, per cent populations with income below $1.08 and $2.15 per day in 1993 international prices[12], and share of the 20 per cent poorest of national income or

[12] This is equivalent to $1 and $2 in 1985 prices, adjusted for purchasing power parity.

consumption from 1990-2001. National estimates of poverty line are based on population weighted subgroup estimates from household surveys.

To conserve spaces, the globalisation index chosen is the unweighted Kearney index defined previously. Information on national poverty line is only available for 29 developing and transition countries included in the globalisation database, and for 38 countries we have information on the share of population with income below $1 and $2 per day. The observation period covers mainly 1993-2000 with a few exceptions dating back to 1989. Information on share of the 20 per cent poorest of national income/consumption is available for 59 countries.[13] The Bank does not provide data on poverty in industrialized countries. These are excluded from the poverty regression analysis.[14]

Estimation results

The estimation results from a regression of the poverty on the unweighted Kearney globalisation index are reported in Table 6. For sensitivity analysis, a number of alternative specifications of the relation in equation 4 are estimated. In the basic model (Model C1) variations in poverty are explained by the aggregate unweighted Kearney globalisation index. The coefficient is negative and statistically weakly significant. Globalisation at most explains only 9 per cent of the variations in poverty among the countries. It indicates a negative relationship between the level of globalisation and poverty at the national level. However, the relationship is not significantly different from zero when poverty is defined as income below $1 (Model C3) or $2 per day (C5). To control for regional heterogeneity we added a number of regional dummies. Accounting for regional heterogeneity (Models C2, C4, C6 and C8) captures most variations in poverty among the countries. The explanatory power of the models increases to up to 0.53 in Model C8.

Again the results presented here must be interpreted with cautious. With the exception of Models C7 and C8, the sample is very small and the periods where poverty and globalisation are measured do not overlap in all cases. In Model C8 where the sample is largest (the regions of Middle East and North Africa, South East Asia, Latin America and sub-Saharan Africa) the poorest 20 per cent have a significantly lower share of income compared to the reference group, East Europe. The share among the East European countries is insignificantly different from that of the West Europeans indicating no link between globalisation and poverty when poverty for the poorest is defined as the share of national income and consumption. As mentioned previously, several factors limit comparability of this study with those found in the literature. The strength of the current study is computation of a multidimensional index of globalisation and the use of statistical methods to establish the relationship between globalisation, inequality and poverty conditional on regional location of countries. The main limitations are the short time period and small number of countries included in our regression analysis.

[13] No data is available for Argentine, Saudi Arabia and Taiwan.

[14] Alternatively one could assign the minimum poverty rate of 2 per cent to the industrialized countries and instead of least squares apply tobit analysis to the censored data to establish the link between poverty and globalization.

8. SUMMARY

This study addresses the measurement of two indices of globalisation, Kearney and principal component analysis, that quantifies the level and development of globalisation to rank countries. The indices are composed of four main components: economic integration, personal contact, technology, and political engagements, each developing differently over time. Alternative weighted and unweighted versions of the two indices are also computed.

The results show that internal and external conflicts seem to effectively reduce countries' globalisation prospects. The low rank of countries is often associated with political and personal factors that several developing countries are unable to address. The high ranked countries share similar patterns in various component distributions. The mean globalisation by region shows that technology factors play an important role in the ranking of regions. This breakdown of the index into major components provides possibilities to identify sources of globalisation and associate it with economic policy measures to bring about desirable changes in national and international policies.

When looking at the simple correlation among the income inequality, poverty and globalisation indices, we find the Gini coefficients negatively correlated with disaggregated personal, technology and political components, but uncorrelated with the economic component. The same negative relationship holds between income inequality and the aggregate globalisation indices. We do not find correlation between the share of poor and inequality, but their share of income is negatively correlated with income inequality. This is interpreted as increased inequality being more disadvantages to the poorest population. Concerning correlation between poverty and globalisation indices, results show that globalisation reduces poverty and increases the poorest share of income, thereby reducing inequality. The reduction in poverty is mostly associated with technology component of globalisation.

In a regression analysis we investigate the relationship between inequality, poverty and globalisation. Results show that the globalisation index explains only 7-11 per cent of the variations in income inequality, and 9 per cent of poverty among the countries. By decomposing the aggregate globalisation index into four components, results show that personal contacts and technology transfers reduce inequality, while economic integration increases inequality. Political engagement is found to have no significant effects on income inequality. Economic globalisation component increases poverty, while personal contact reduces poverty. When controlling for regional heterogeneity, we find that the regional variable plays an important role in the explanation of a variation in inequality and poverty, which makes the globalisation coefficient insignificant.

Although the current version of the index quantifies the level of globalisation well, it has certain limitations and the results should be interpreted with caution. We have addressed a number of extensions to overcome several of the shortcomings. These concern an axiomatic approach to set out the desirable properties of the index, the use of panel data, identification and incorporation of more dimensions or components and the use of estimation methods that avoid the choice of weights attached to each index component on an ad hoc basis. These are important issues in understanding how globalisation functions and how to use the generated information in policy formulation and development evaluations. The index is in an early stage of development but has identified several directions along which future advances can be made. In order to make

the regression results on the link between globalisation, inequality and poverty more stable and to cover different phases of globalisation one should extend the data both in time and country dimensions.

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Table 1. Summary statistics, globalisation data, 1995-2000, NT=62x6=372 observations

Variable	Mean	Median	Std Dev	Minimum	Maximum
A. Economic integration					
1. Trade (w=1)	0.777	0.6750	0.505	0.157	3.475
2. Foreign direct investment (*w*=2)	0.043	0.0285	0.050	0.000	0.331
3. Portfolio investment (*w*=2)	0.057	0.0229	0.150	0.000	1.669
4. Income payments and receipts (w=1)	0.090	0.0604	0.099	0.005	0.782
B. Personal contacts					
1. International telephone traffic (*w*=2)	97.432	44.245	128.910	0.900	707.460
2. International travel & tourism (*w*=1)	0.806	0.348	1.056	0.003	6.361
3. Transfer payments & receipts (*w*=1)	0.033	0.027	0.030	0.000	0.150
C. Technology					
1. Internet users (*w*=2)	0.064	0.018	0.101	0.000	0.594
2. Internet hosts (*w*=1)	0.013	0.002	0.027	0.000	0.295
3. Secure internet servers (*w*=1)	0.011	0.001	0.029	0.000	0.283
D. Political engagements					
1. Embassies in country (*w*=1)	71.613	68.500	34.197	13.000	172.000
2. Membership in intl org. (*w*=1)	48.806	47.800	10.382	6.000	77.000
3. Particip. in UN SC missions (*w*=1)	0.251	0.222	0.205	0.000	0.778
E. Income inequality measures (n1=n2==60):					
1. Gini from most recent year	38.349	36.670	9.218	23.702	59.000
2. Mean multiple period Gini	38.342	36.580	9.326	21.990	60.690
F. Poverty measures (n1=29, n2=n3=38 and n4=59):					
1. % population below poverty line	28.348	28.600	14.281	4.600	64.000
2. % population below $1 per day	12.826	6.350	18.269	2.000	82.200
3. % population below $2 per day	31.853	24.050	27.997	2.000	96.400
4. Share of 20% poorest of national income and consumption	6.583	6.900	2.219	1.400	10.600
G. Kearney globalisation indices:					
1. Unweighted Kearney index (K)	2.980	2.437	1.420	1.069	7.978
2. Weighted Kearney index (KW)	3.646	2.825	2.035	1.168	11.055
H. Principal component globalisation indices:					
1. First principal component (PC1)	1.029	0.598	1.000	0.000	6.279
2. Second principal component	4.279	4.375	1.000	0.000	8.832
3. Third principal component	6.810	6.853	1.000	0.000	10.530
4. Weighted first three PC (PCW) index	2.945	2.808	0.636	1.613	5.238

Source: Authors calculations.
Notes: w = weights.

Table 2. Pearson correlation coefficients, NT = 372.

	year	econom	person	techno	politi	K	KW	PC1	PCW
Year	1.0000								
Economic	-0.1380	1.0000							
	0.0076								
Personal	0.0399	0.5871	1.0000						
	0.4423	0.0001							
Technology	0.1150	0.2906	0.3446	1.0000					
	0.0265	0.0001	0.0001						
Political	0.0046	0.0312	0.0243	0.3952	1.0000				
	0.9282	0.5475	0.6403	0.0001					
K	0.0010	0.7119	0.6840	0.7576	0.5523	1.0000			
	0.9832	0.0001	0.0001	0.0001	0.0001				
KW	-0.0082	0.7630	0.6863	0.7550	0.4738	0.9909	1.0000		
	0.8746	0.0001	0.0001	0.0001	0.0001	0.0001			
PC1	0.2946	0.6395	0.6327	0.7127	0.3947	0.8774	0.8842	1.0000	
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		
PCW	0.2314	0.3759	0.3313	0.6712	0.7975	0.8156	0.7840	0.8392	1.0000
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	

Source: Authors calculations.

Notes: K=Unweighted Kearney index, KW=weighted Kearney index, PC1=unweighted (first) principal component index, PCW=weighted principal component index based the first three principal components.
p-values are given under the coefficients.

Table 3A. Globalisation index by country, ranked by the first principal component (PC1).

Rank1	country	econom	person	techno	politi	K	Rank2	KW	PC1	PCW	gini	mgini
1	Ireland	2.477	1.899	0.560	1.510	6.446	1	8.643	3.726	3.887	36.962	36.80
2	Singapore	2.729	1.551	0.920	0.734	5.935	2	8.575	3.181	3.197	38.115	42.49
3	Switzerland	1.545	1.746	0.999	1.689	5.979	3	8.137	3.050	3.996	33.100	33.20
4	Sweden	1.444	0.900	1.346	2.178	5.868	4	7.941	2.735	4.074	33.663	38.14
5	Netherland	1.892	0.927	0.807	1.577	5.202	6	7.125	2.506	3.725	32.200	32.10
6	Canada	0.872	0.825	1.467	2.434	5.598	5	7.170	2.456	4.101	30.050	30.83
7	USA	0.436	0.275	2.400	2.531	5.641	8	6.739	2.391	4.299	40.425	38.65
8	Norway	0.874	0.836	1.699	1.685	5.094	7	6.881	2.289	3.615	39.422	30.74
9	Finland	0.790	0.731	1.752	1.818	5.091	9	6.586	2.260	3.682	31.500	29.33
10	Denmark	1.242	1.000	0.903	1.925	5.069	10	6.529	2.228	3.666	35.525	34.04
11	Austria	0.890	1.272	0.761	2.081	5.005	11	6.313	2.132	3.793	26.500	25.91
12	UK	1.265	0.545	0.736	2.181	4.727	12	6.030	2.011	4.012	37.275	30.87
13	NewZealand	0.603	0.699	1.311	1.144	3.757	13	4.913	1.681	3.081	30.335	45.61
14	Czech Rep.	0.833	1.281	0.225	1.410	3.749	18	4.346	1.620	3.254	23.900	23.22
15	France	0.683	0.479	0.302	2.564	4.028	14	4.875	1.603	4.061	32.700	38.14
16	Germany	0.712	0.472	0.513	1.960	3.657	16	4.631	1.477	3.679	31.787	31.67
17	Australia	0.535	0.354	1.309	1.396	3.594	17	4.526	1.456	3.242	44.600	37.68
18	Panama	1.943	0.322	0.039	0.642	2.947	22	3.725	1.224	2.508	52.034	49.22
19	Portugal	0.883	1.008	0.335	1.404	3.630	15	4.641	1.199	2.990	35.600	36.26
20	Hungary	0.898	0.690	0.165	1.283	3.036	23	3.650	1.183	3.000	25.300	24.61
21	Malaysia	1.159	0.642	0.145	1.244	3.190	21	3.756	1.182	2.689	48.500	47.71
22	Spain	0.635	0.676	0.297	1.530	3.139	20	3.850	1.132	3.214	23.702	30.93
23	Italy	0.649	0.544	0.210	2.096	3.499	19	4.171	1.102	3.469	31.217	35.68
24	Israel	0.547	0.999	0.536	0.764	2.847	24	3.566	0.927	2.487	38.200	32.70
25	Poland	0.412	0.565	0.124	1.891	2.991	25	3.376	0.925	3.124	32.700	26.60
26	Chile	0.784	0.197	0.106	1.124	2.211	29	2.879	0.763	2.779	55.516	50.93
27	Japan	0.284	0.073	0.549	1.496	2.403	27	2.940	0.763	3.168	24.900	35.53
28	Argentina	0.473	0.091	0.056	1.981	2.600	26	3.024	0.743	3.225	46.660	51.79
29	Greece	0.223	0.861	0.154	1.278	2.515	28	2.919	0.697	2.807	32.700	41.56
30	Slovenia	0.510	0.490	0.514	0.500	2.014	37	2.618	0.670	2.239	29.690	25.66
31	Slovak Rep.	0.631	0.412	0.209	0.875	2.127	38	2.576	0.653	2.378	23.709	21.99
32	Nigeria	0.617	0.305	0.001	1.653	2.576	32	2.781	0.618	2.804	50.300	43.20
33	Croatia	0.547	0.873	0.111	0.594	2.125	34	2.727	0.608	2.242	30.067	25.68
34	Russian Fed.	0.322	0.090	0.032	2.168	2.613	30	2.801	0.585	3.190	39.575	34.14
35	Korea Rep.	0.478	0.258	0.322	1.058	2.116	35	2.698	0.560	2.635	31.600	34.18
36	Mexico	0.550	0.235	0.041	1.122	1.947	40	2.340	0.520	2.750	51.978	51.08
37	Tunisia	0.441	0.507	0.005	1.288	2.241	39	2.407	0.510	2.598	40.410	44.92
38	Botswana	0.811	1.153	0.017	0.477	2.458	36	2.659	0.504	1.966	52.302	53.90
39	Venezuela	0.467	0.102	0.038	1.312	1.919	44	2.226	0.501	2.812	47.248	42.90
40	Philippine	0.802	0.161	0.013	0.876	1.852	49	2.172	0.464	2.454	47.900	46.94
41	Thailand	0.647	0.133	0.021	1.034	1.835	51	2.117	0.460	2.522	41.750	45.03
42	Indonesia	0.451	0.069	0.006	1.492	2.018	47	2.195	0.456	2.759	35.270	36.36
43	Egypt	0.242	0.496	0.005	1.904	2.647	33	2.747	0.447	2.946	28.900	33.72
44	China	0.393	0.043	0.009	1.577	2.022	42	2.289	0.412	2.887	40.300	29.35
45	Romania	0.345	0.303	0.044	1.207	1.899	50	2.128	0.404	2.623	36.378	26.38
46	Brazil	0.258	0.045	0.059	1.464	1.825	53	2.078	0.400	2.887	58.846	54.99
47	South Afr.	0.507	0.123	0.145	0.985	1.759	45	2.215	0.393	2.607	59.000	54.89
48	Taiwan	0.530	0.372	0.427	0.010	1.339	55	1.977	0.382	1.766	31.700	33.04
49	India	0.166	0.215	0.004	1.697	2.082	46	2.208	0.362	2.898	35.457	34.55
50	Turkey	0.260	0.278	0.036	1.301	1.875	54	2.026	0.362	2.696	45.625	49.21
51	Pakistan	0.186	0.378	0.001	1.674	2.238	41	2.307	0.354	2.760	31.200	34.26
52	Saudi Arab.	0.518	0.959	0.009	0.979	2.464	31	2.799	0.347	2.308	.	.
53	Senegal	0.350	0.535	0.003	1.263	2.151	43	2.279	0.344	2.483	41.300	49.96
54	Colombia	0.347	0.133	0.031	0.962	1.472	59	1.770	0.297	2.592	57.100	51.79
55	Ukraine	0.349	0.240	0.010	1.033	1.632	60	1.766	0.278	2.353	32.941	28.43
56	Peru	0.342	0.159	0.021	0.899	1.422	61	1.668	0.274	2.527	49.006	49.46
57	Bangladesh	0.076	0.414	0.000	1.609	2.099	52	2.116	0.260	2.595	38.800	37.68
58	Kenya	0.196	0.495	0.003	1.459	2.153	48	2.173	0.255	2.511	51.000	60.69
59	Sri Lanka	0.406	0.597	0.006	0.721	1.730	56	1.872	0.178	2.138	34.400	40.40
60	Morocco	0.234	0.599	0.003	0.953	1.789	57	1.841	0.166	2.313	.	.
61	Iran	0.085	0.049	0.002	1.055	1.191	62	1.203	0.076	2.532	42.900	45.59
62	Uganda	0.221	0.824	0.001	0.619	1.664	58	1.799	0.036	2.008	39.200	37.19

Source: Authors calculations.

Notes: K=Unweighted Kearney index, KW=weighted Kearney index, PC1=unweighted (first) principal component index, PCW=weighted principal component index based the first three principal components. Gini and mgini are the recent period and mean multiple period Gini coefficients. Rank1 and Rnk2 are rank orders by PC1 and KW.

Table 3B. Globalisation index by region, ranked in descending order of first principal component index, NT=372.

Region	Economic	Personal	Technol.	Political	K	KW	PC1	PCW
West Europe[1]	0.947	0.806	0.921	1.824	4.497	5.778	1.945	3.628
South East Asia	1.158	0.511	0.221	1.076	2.966	3.763	1.149	2.724
East Europe	0.539	0.549	0.159	1.218	2.465	2.887	0.770	2.712
Middle E&N Africa	0.374	0.640	0.099	1.198	2.311	2.564	0.460	2.558
Latin America	0.645	0.161	0.049	1.188	2.043	2.464	0.590	2.760
East Asia	0.467	0.225	0.253	0.881	1.826	2.321	0.451	2.429
sub-Saharan Africa	0.450	0.572	0.028	1.076	2.127	2.318	0.359	2.396
South Asia	0.184	0.331	0.003	1.351	1.868	1.941	0.246	2.585

Note 1 Equivalent of industrialised countries. It includes West Europe and Australia, Japan, USA and Canada.

Table 3C. Development of globalisation index over time, NT=372.

Year	Economic	Personal	Technol.	Political	K	KW	PC1	PCW
1995	0.726	0.522	0.266	1.380	2.893	3.546	0.689	2.767
1996	0.760	0.576	0.316	1.374	3.026	3.725	0.749	2.815
1997	0.861	0.522	0.349	1.359	3.091	3.841	0.872	2.869
1998	0.595	0.543	0.404	1.388	2.929	3.553	1.050	2.945
1999	0.545	0.612	0.441	1.380	2.978	3.595	1.264	3.079
2000	0.577	0.566	0.438	1.381	2.961	3.614	1.550	3.179

Table 3D. Percentage change in globalisation index over time, NT=372.

Year	Economic	Personal	Technol.	Political	K	KW	PC1	PCW
1995/1996	10.07	18.80	63.45	-0.02	5.43	6.15	8.56	1.73
1996/1997	16.93	-8.05	31.21	-0.33	2.53	3.77	22.85	1.88
1997/1998	-28.19	3.27	55.97	2.20	-5.23	-7.17	18.18	2.40
1998/1999	-9.41	16.96	52.00	0.67	1.82	0.80	16.94	4.14
1999/2000	9.06	-6.79	29.17	0.62	-0.55	0.41	21.32	3.32

Source: Authors calculations.

Notes: K=Unweighted Kearney index, KW=weighted Kearney index, PC1=unweighted (first) principal component index, PCW=weighted principal component index based the first three principal components.

Table 4. Pearson correlation coefficients, N=60.

	Econom	Person	Techno	Politi	K	KW	PC1	PCW	gini	mgini	PBPL	PB$1	PB$2	IS20
economic	1.000													
personal	0.648	1.000												
	0.001													
technology	0.365	0.350	1.000											
	0.003	0.005												
political	0.039	0.024	0.407	1.000										
	0.762	0.851	0.001											
Kearney(K)	0.729	0.690	0.782	0.562	1.000									
	0.001	0.001	0.001	0.001										
Kearneyw(KW)	0.774	0.698	0.786	0.487	0.992	1.000								
	0.001	0.001	0.001	0.001	0.001									
princom1(PC1)	0.803	0.689	0.765	0.452	0.978	0.989	1.000							
	0.001	0.001	0.001	0.001	0.001	0.001								
princomp(PCW)	0.444	0.332	0.689	0.852	0.859	0.828	0.820	1.000						
	0.001	0.008	0.001	0.001	0.001	0.001	0.001							
gini	-0.065	-0.373	-0.267	-0.224	-0.326	-0.314	-0.302	-0.289	1.000					
	0.619	0.003	0.038	0.084	0.011	0.014	0.018	0.024						
mgini	-0.082	-0.298	-0.273	-0.208	-0.305	-0.298	-0.292	-0.279	0.841	1.000				
	0.530	0.020	0.034	0.110	0.017	0.020	0.023	0.030	0.001					
PBPL	-0.148	0.032	-0.302	-0.216	-0.314	-0.322	-0.329	-0.337	0.202	0.211	1.000			
	0.440	0.868	0.110	0.258	0.096	0.088	0.081	0.073	0.300	0.281				
PB$1	-0.210	0.056	-0.345	0.041	-0.135	-0.220	-0.323	-0.208	0.189	0.146	0.511	1.000		
	0.204	0.737	0.033	0.803	0.415	0.183	0.047	0.208	0.261	0.387	0.005			
PB$2	-0.369	-0.103	-0.574	0.206	-0.247	-0.392	-0.505	-0.184	0.117	0.162	0.455	0.831	1.000	
	0.022	0.537	0.001	0.212	0.133	0.014	0.001	0.266	0.490	0.335	0.014	0.001		
IS20	-0.037	0.262	0.239	0.214	0.234	0.216	0.195	0.199	-0.850	-0.760	-0.102	-0.093	0.019	1.000
	0.777	0.044	0.067	0.102	0.074	0.099	0.137	0.129	0.001	0.001	0.604	0.578	0.908	

Source: Authors calculations.

Notes: p-values are given under the coefficients. K and KW are unweighted and weighted Kearney globalisation indices. The PC1 and PCW are the unweighted (first) and weighted (first three) principal component globalisation indices. Gini and mgini are the recent period and mean multiple period Gini coefficients. PBPL is per cent population below national poverty line, PB$1 is per cent population below $1 per day, , PB$1 is per cent population below $2 per day, and IS20 is share of 20 per cent poorest of national income or consumption.

Table 5A. LS parameter estimates of the impact of the Kearney globalisation index on most recent years of income inequality (gini).

	Unweighted Kearney globalisation index (K)								Weighted Kearney (KW)	
Explanatory variables	Model A1	Model A2	Model A3	Model A4	Model A5	Model A6	Model A7	Model A8	Model A9	Model A10
Intercept	45.8642 a	37.5410 a	34.2443 a	34.9793 a	38.4699 a	33.4670 a	34.1586 a	32.4668 a	45.2898 a	39.4501 a
Log K globalisation index	-7.4923 a					-	-0.6478 .	-	-	-
Log KW globalisation index						-	-	-	-6.9937 a	-3.4690 .
Log economic integration		-1.2966 .				3.7486 b	-	2.1313 .	-	-
Log personal contact			-4.2817 a			-4.5780 a	-	-3.3735 a	-	-
Log technology				-1.3914 a		-1.2066 b	-	0.9879 c	-	-
Log political engagement					-0.6328 .	-0.4883 .	-	0.3044 .	-	-
Middle East & North Africa						-	4.6848 .	9.3241 a	-	3.4092 .
East Asia						-	0.7517 .	0.1785 .	-	-5.8351 .
South East Asia						-	8.7789 a	8.5782 a	-	7.5161 b
South Asia						-	2.7820 .	8.1049 b	-	0.8502 .
Latin America						-	18.5843 a	17.5835 a	-	13.2485 a
sub-Saharan Africa						-	15.1725 a	21.0475 a	-	12.7544 a
East Europe						-	-3.1218 .	-1.0605 .	-	-9.1353 a
Indust. countries (reference)						-	-	-	-	-
R-square adjusted	0.1119	-0.0068	0.1804	0.0998	-0.0145	0.2274	0.6381	0.6834	0.0952	0.6870
F-value	8.4300 a	0.6000 .	13.9800 a	7.5400 a	0.1500 .	5.3400 a	14.000 a	12.5800 a	7.2000 a	17.1900 a
RMSE	8.6873	9.2495	8.3457	8.7460	9.2851	8.1027	5.5458	5.1870	8.7734	5.1599
Number of observations	60	60	60	60	60	69	60	60	60	60

Source: Authors calculations.

Notes: Significant at less than 1%(a), 1-5%(b), 5-10%(c), and greater than 10%(.) level of significance. The square of weighted and unweighted Kearney globalisation indices in Models A1 and A9 are insignificant indicating absence of U-shaped relationship between inequality and globalisation. RMSE is root mean square error.

Table 5.B. LS parameter estimates of the impacts of unweighted Kearney globalisation index (K) on periods mean income inequality (mgini).

Explanatory variables	Model B1	Model B2	Model B3	Model B4	Model B5	Model B6	Model B7	Model B8
Intercept	45.3279 a	37.0677 a	35.1122 a	34.7682 a	38.4625 a	33.7618 a	40.4570 a	34.4889 a
Log K globalisation index	-6.9450 a					-	-3.9352 .	-
Log economic integration		-2.0444 .				2.0001 .	-	-0.9609 .
Log personal contact			-3.3687 a			-2.8938 b	-	-1.5141 .
Log technology				-1.4755 a		-1.2950 b	-	0.5202 .
Log political engagement					-0.6325 .	-0.4388 .	-	-0.7727 .
Middle East & North Africa						-	3.0800 .	5.6964 c
East Asia						-	-5.9775 .	-5.7022 .
South East Asia						-	7.0789 b	8.8086 a
South Asia						-	0.4034 .	2.7974 .
Latin America						-	12.5126 a	13.8832 a
sub-Saharan Africa						-	12.5341 a	16.1924 a
East Europe						-	-10.7333 a	-8.8150 a
Indust. Countries (reference)						-	-	-
R-square adjusted	0.0918	0.0082	0.1023	0.1114	-0.0146	0.1303	0.7129	0.7082
F-value	6.9600 a	1.4900 .	7.7200 a	8.4000 a	0.1500 .	3.2100 b	19.3200 a	14.0200 a
RMSE	8.8877	9.2877	8.8363	8.7912	9.3939	8.6974	4.9966	5.0377
Number of observations	60	60	60	60	60	60	60	60

Source: Authors calculations.

Notes: Significant at less than 1%(a), 1-5%(b), 5-10%(c), and greater than 10%(.) level of significance. The square of the unweighted Kearney globalisation index (K) in Model B1 is insignificant indicating absence of U-shaped relationship between inequality and globalisation. RMSE is root mean square error.

Table 5C. LS parameter estimates of the impact of the first principal component globalisation index (PC1) on income inequality.

	Dependent variable is Last year Gini			Dependent variable is multiple period mean Gini		
Explanatory variables	Model C1	Model C2	Model C3	Model C4	Model C5	Model C6
Intercept	41.6658 a	45.0123 a	32.9088 a	41.5862 a	45.3190 a	37.1401 a
PC1 globalisation index	-3.1456 b	-10.5145 b	0.2568 .	-3.0770 b	-11.2968 b	-1.2632 .
Squared PC1 globalisation Index	-	2.3479 c	-	-	2.6190 c	-
Middle East & North Africa	-	-	5.4308 .	-	-	3.7066 .
East Asia	-	-	1.7087 .	-	-	-4.3802 .
South East Asia	-	-	9.3033 a	-	-	8.0168 a
South Asia	-	-	3.7795 .	-	-	1.6664 .
Latin America	-	-	19.4381 a	-	-	13.8757 a
sub-Saharan Africa	-	-	16.0495 a	-	-	13.2845 a
East Europe	-	-	-2.4331 .	-	-	-9.8667 a
Indust. Countries (reference)	-	-	-	-	-	-
R-square adjusted	0.0758	0.1030	0.6380	0.0697	0.1063	0.7053
F-value	5.8400 b	4.3900 b	14.0000 a	5.4200 b	4.5100 b	18.6500 a
RMSE	8.8622	8.7305	5.5466	8.9951	8.8166	5.0630
Number of observations	60	60	60	60	60	60

Source: Authors calculations.

Note: Significant at less than 1%(a), 1-5%(b), 5-10%(c), and greater than 10%(.) level of significance.

Table 6. LS parameter estimates of the impact of unweighted Kearney globalisation index (K) on poverty.

Explanatory variables	% population below poverty line		% population below $1 per day		% population below $2 per day		Share of 20% poorest of national income or consumption	
Explanatory variables	Model C1	Model C2	Model C3	Model C4	Model C5	Model C6	Model C7	Model C8
Intercept	45.9115 a	42.8558 a	18.9551 c	0.6690 .	48.9832 a	12.4765 .	5.2204 a	8.3772 a
Log K globalisation index	-23.4127 c	-20.7256 c	-8.1328 .	2.0192 .	-22.7321 .	-1.6524 .	-1.3508 b	0.1029 .
Middle East & North Africa	-	-12.1044 .	-	0.0962 .	-	8.3839 .	-	-1.7002 b
East Asia	-	-23.6639 c	-	8.1132 .	-	16.5746 .	-	-1.5520 .
South East Asia	-	-3.7445 b	-	4.2234 .	-	19.6980 .	-	-2.6117 a
South Asia	-	5.8022 .	-	18.5577 b	-	45.9763 a	-	-0.6390 .
Latin America	-	3.3624 .	-	8.3663 .	-	12.6077 .	-	-5.4438 a
sub-Saharan Africa	-	13.7536 c	-	36.5491 a	-	53.3331 a	-	-3.8369 a
East Europe (reference)	-	-	-	-	-	-	-	-
Indust. Countries (reference)	-	-	-	-	-	-	-	-1.1481 .
R-square adjusted	0.0914	0.2979	-0.0153	0.3707	0.0138	0.4104	0.0540	0.5231
F-value	3.8200 c	2.7000 b	0.4400 .	4.1100 a	1.5200 .	4.6800 a	4.3100 b	8.9500 a
RMSE	13.6133	11.9663	18.4079	14.4924	27.8032	21.4981	2.1579	1.5322
Number of observations	29	29	38	38	38	38	59	59

Source: Authors calculations.

Notes: Significant at less than 1%(a), 1-5%(b), 5-10%(c), and greater than 10%(.) level of significance. RMSE is root mean square error.

Figure 1. Unweighted Kearney globalizatuíon index (K) decomposed by its components.

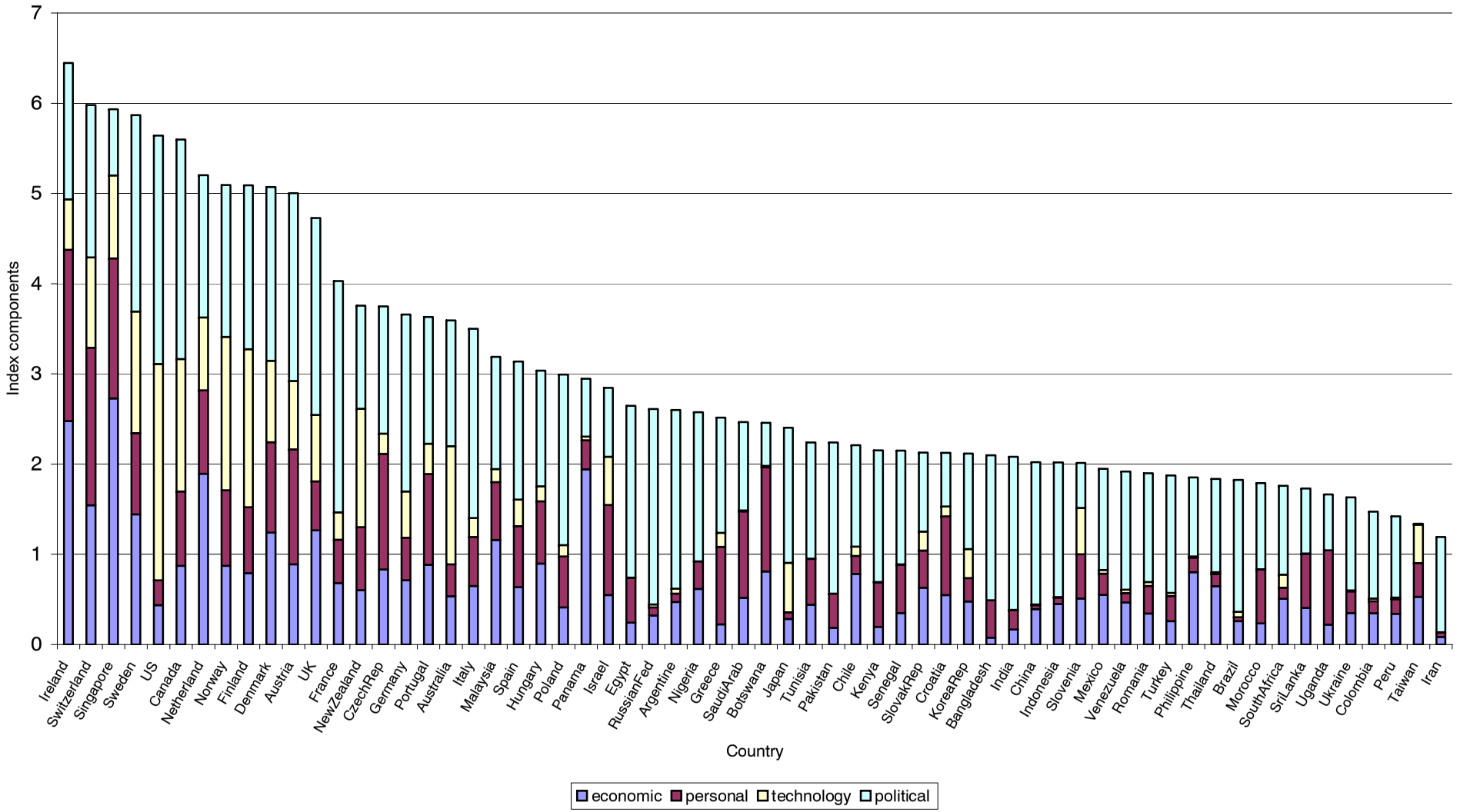

Figure 2. Globalization indices by counry.

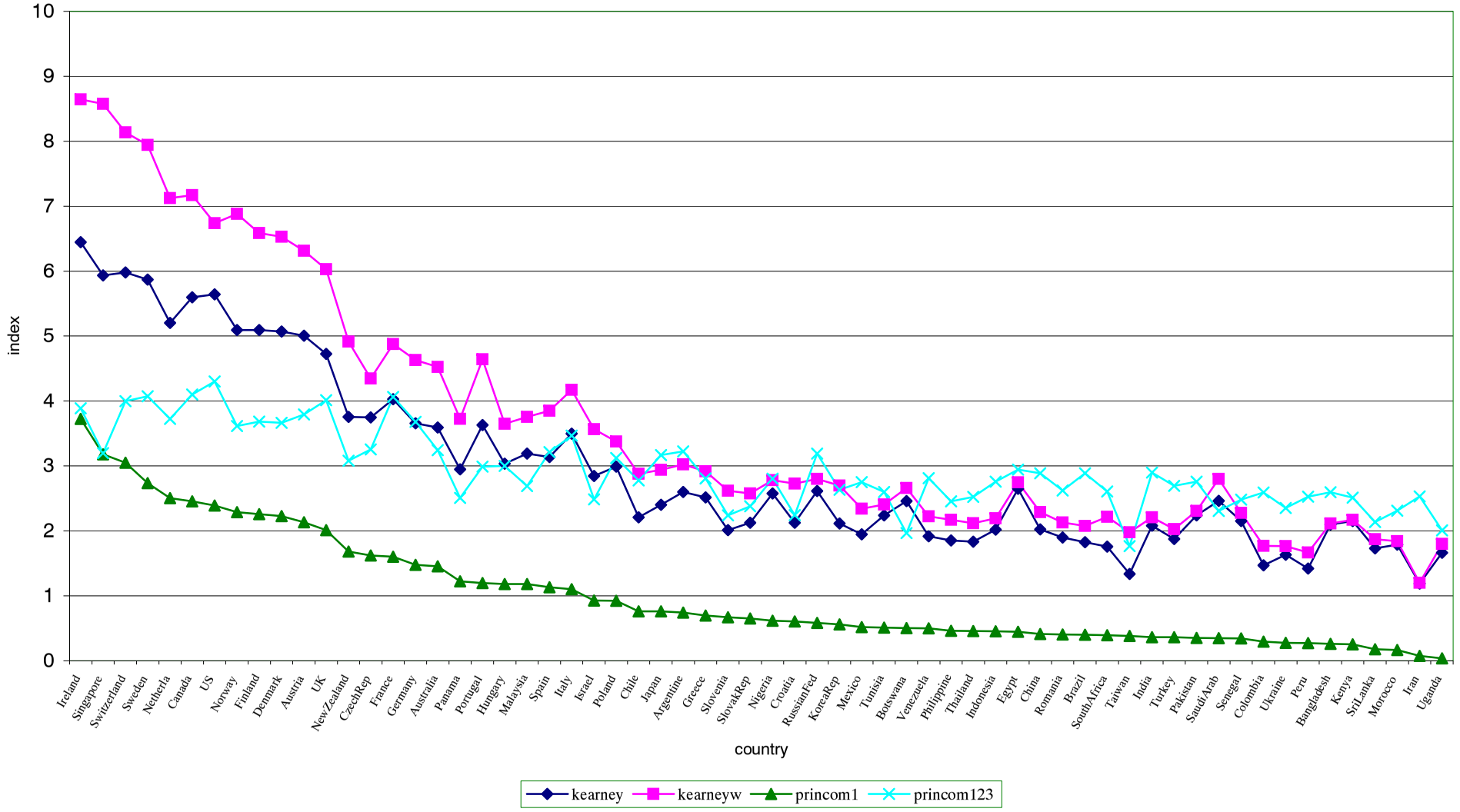

Figure 3. Development of unweighted Kearney index of globalization (K) over time.

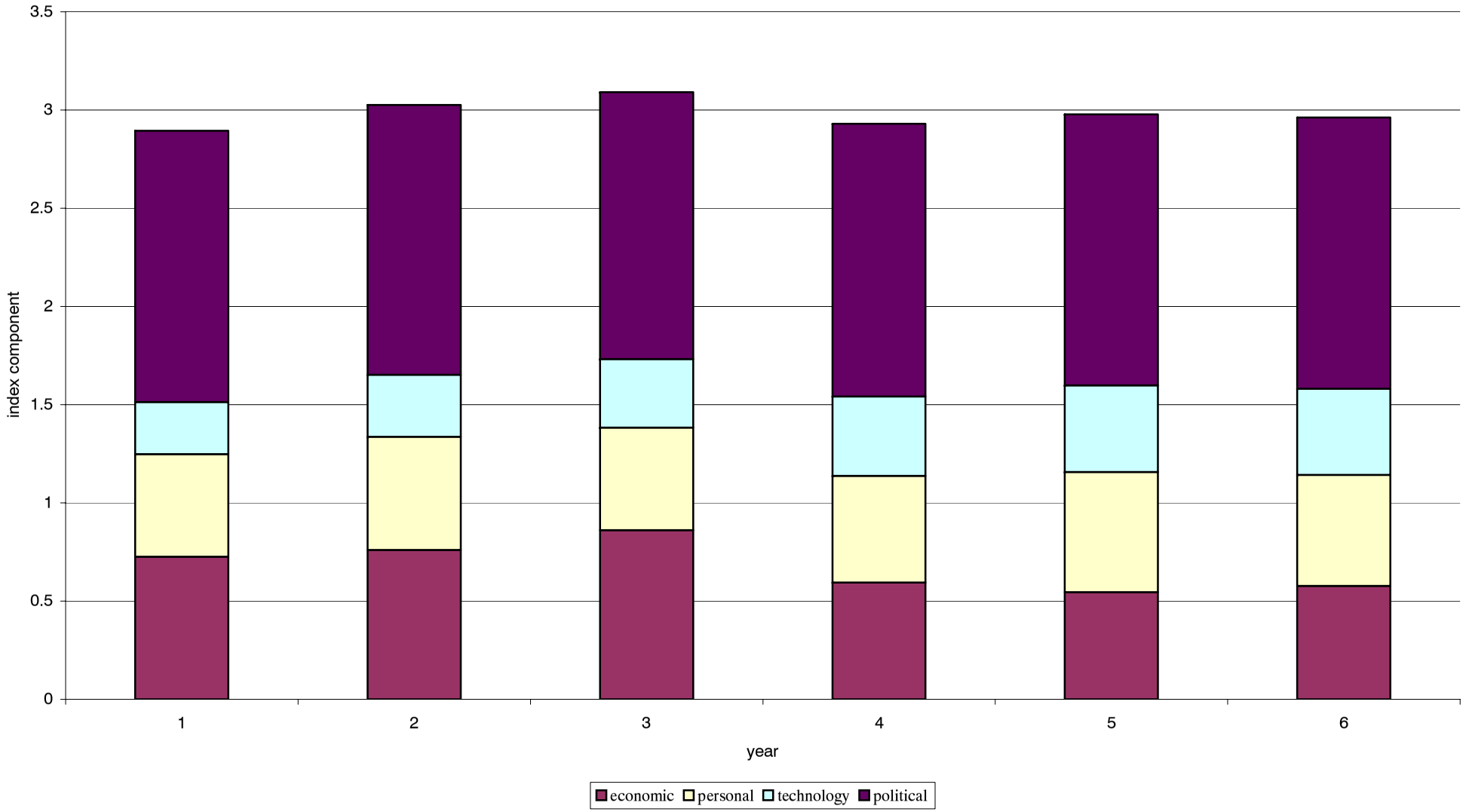

Figure 4. Globalization indices by regions.