Capital Account Liberalization and Poverty: How Close is the Link?

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Abstract

The literature on the theoretical and empirical aspects of the relationship between finance and economic growth is both substantial and extensive. The same cannot be said on the relationship between financial development and poverty reduction. There has been comparatively little research on this equally important aspect. This study aims to fill this gap with this study. We visit the theoretical arguments and conduct an empirical analysis of the relationship between the capital account dimension of financial liberalization and poverty for developing countries for the period 1985-2005. In particular, we test whether capital account liberalization has helped alleviate poverty, and also whether the extent to which capital account liberalization affects poverty depends on the quality of institutions. We use OLS and IV techniques as well as the system GMM technique. Our findings indicate that countries with higher institutional quality have lower poverty rates, but that there is no statistically significant relationship between the degree of capital account liberalization during the period and the poverty rate.

Keywords: capital account liberalization, poverty, quality of institutions, developing countries

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Capital Account Liberalization and Poverty: How Close is the Link?

1. Introduction[1]

The importance of world poverty alleviation cannot be exaggerated. In 1998 1.2 million people in the world lived on or less than $400 per year (Beck et al., 2004). There are also dramatic differences in poverty among countries, even among developing countries. This paper focuses on the financial aspects of poverty alleviation in developing countries and asks whether capital account liberalization can actually lead to lower poverty.

The literature on the theoretical and empirical aspects of the relationship between finance and economic activity is both substantial and extensive. The main contributions conclude that "with informed policy choices, finance can be a powerful force for growth" (World Bank, 2001, p.1). Other requirements are also emphasized. The establishment of macroeconomic stability is thought to be a first requirement (Holden and Prokopenko, 2001), although this factor is not expected to be a sufficient condition. Establishing a basis for adequate regulation and supervision of financial institutions is particularly apt in developing and transition countries, because of a greater need for building public confidence in the financial system (Ito, 2006). Holden and Prokopenko (op. cit.) also mention the need for financial institutions that are specialized in certain industries or certain types of lending, such as factoring and leasing companies or mortgage finance companies. These institutions are in a better position than large multi-purpose institutions to assess financial and investment plans in their field of expertise. They can help small and medium size enterprises with their financing needs in case commercial banks lend only to large and well-established firms. Further requirements are also highlighted: the importance of strong macroeconomic fundamentals, sound systems of banking regulation and supervision, and reasonable economic policies along with sound financial institutions being in place, are particularly emphasized (Stiglitz, 2000).

Regrettably and surprisingly, the literature on the relationship between financial development and poverty reduction, an aspect of equal importance as that of the nexus between finance and growth/development, is disappointingly small. The relevant studies include, Arestis and Caner (2005), Jalilian and Kirkpatrick (2002), Dollar and Kraay (2002), Jeanneney and Kpodar (2008), Honohan (2004), Beck et al. (2004, 2007), and Honohan and Beck (2007). The findings of these studies are mixed. Arestis and Caner (2005) report that the growth channel is not the only channel through which financial liberalization can affect poverty, but that there are two further channels, namely the financial crises channel and the availability of financial services and credit channel. Jalilian and Kirkpatrick (2002) test econometrically the relationship between financial development and poverty through the growth channel. Based on the estimation of two equations (a growth and a poverty regression), these authors report that the change in growth of average income with respect to a unit change in financial development is equal to 0.4, and the rate of change in the growth of income of the poor with respect to one percent change in the growth of average income of population is approximately

[1] We are grateful to TUBITAK (the Scientific and Technological Research Council of Turkey) for supporting this research project, numbered 107K355. Comments received from Dean Baker and from the participants to the 2008 ASSA meetings, AFEE session entitled Financial Institutions, Poverty and Income Distribution (New Orleans, USA), as well as from the participants to the 2008 International Conference on Emerging Economic Issues in a Globalizing World (Izmir, Turkey), are gratefully acknowledged and appreciated. We thank Ekrem Cunedioglu for help on data entry and organization. The usual disclaimer applies.

equal to 1. They then conclude that one unit change in financial development leads to a 0.4 percent change in the growth rate of the incomes of the poor, assuming that there are no direct effects.

The study by Jeanneney and Kpodar (2008) is concerned with financial liberalization in more general terms. The study argues that the standard financial liberalization effect of the McKinnon (1973) type is directly effective in reducing poverty, as is the more indirect effect via economic growth; the former is found to be empirically stronger than the latter. Dollar and Kraay (2002) find that some determinants of growth, such as good rule of law, openness to international trade, and developed financial markets have little systematic effect on the income share of the poor (the bottom quintile). What this means in the authors' view is that such factors 'benefit the poorest fifth of society as much as everyone else'. Honohan (2004) shows that financial depth is associated negatively with poverty. This negative relationship is robust even after taking into account the mean income and the share going to the top income groups. Honohan and Beck (2007) suggest that 'effetive finance' provides a "ladder for the poor to climb" (p. 11) and that indeed financial depth is conducive to poverty reduction, so that "countries with deep financial system also seem to have a lower incidence of poverty than others at the same level of national income" (p. 12). Bank credit to the private sector is thought to be the best measure of effective finance since "it captures the degree to which banks are channeling society's savings to productive uses" (p. 21).

There are, though, costs as well (see Honohan, 2004; Beck et al., 2004, 2007; Honohan and Beck, 2007). The poor benefit from the banking system's ability to provide more savings opportunities but do not manage to benefit from the greater availability of credit; and to the extent financial liberalization affects growth positively, it also affects poverty. However, financial liberalization promotes financial instability, which hurts the poor, who are vulnerable to unstable and malfunctioning institutions. Ultimately, though, the benefits outweigh the costs for the poor.

This study contributes to the literature by examining both theoretically and empirically the relationship between capital account liberalization and poverty for the first time. While financial liberalization embodies a number of aspects, namely "… the deregulation of the foreign sector capital account, the domestic financial sector, and the stock market sector viewed separately from the domestic financial sector" (Arestis and Caner, 2005, p. 92), in this study we will deal with only just one aspect, namely the one that focuses on the deregulation of the foreign sector capital account. We are, thus, concerned in this study with the relationship between poverty reduction and capital account liberalization directly. This approach bypasses the intermediate step of examining the relationship between capital account liberalization and growth; it, instead, directly examines the relationship between liberalization and poverty.[2]

We focus on developing countries and exclude developed countries from our sample (unlike Beck et al., 2004, 2007), because the nature and the extent of poverty in developing countries requires more urgent attention, and because we think that the dynamics of poverty reduction

[2] A recent study that is concerned with the relationship between foreign capital inflows and economic growth in developing and emerging countries is Prasad and Rajan (2008). They find a weak relationship at best. They argue, though, that "capital account liberalization may best be seen not just as an independent objective but as part of an organizing framework for policy changes in a number of dimensions" (p. 26).

are different in these countries than in developed countries. This is important, especially when cross-country heterogeneity is a major concern.

The remaining sections of this paper are organized as follows: In section 2, we examine the theoretical basis of the relationship between capital account liberalization and poverty before we investigate it empirically. In section 3, we describe how we measure capital account liberalization, poverty and institutional quality. The empirical strategy that we follow and our findings are the focus of section 4; and finally we summarize and conclude in section 5.

2. Theoretical Considerations

Theory provides conflicting predictions concerning the relationship between capital account liberalization and poverty alleviation. On the one hand, by ameliorating information and transaction costs and therefore allowing more entrepreneurs to obtain external finance, capital account liberalization improves the allocation of capital, thereby exerting a particularly large impact on the poor. To the extent that financial systems function better as a result of capital account liberalization, financial services become available to a larger proportion of the population and to the poor. On the other hand, capital account liberalization and improvements in the financial system primarily benefit the rich and those who are politically connected. Especially at the early stages of capital account liberalization, financial services, and credit in particular, are limited to the wealthy and connected. A greater degree of capital account liberalization, then, may only succeed in channeling more capital to the few, but certainly not to the poor. A third view poses the question of a non-linear relationship between capital account liberalization and income distribution, and more specifically of an inverted U-shaped curve: at the early stages of capital account liberalization only a few relatively wealthy individuals have access to financial markets. With sustained capital account liberalization more people can afford to join the formal financial sector and thus more people can enjoy the full benefits. Thus, while the distributional effects of financial deepening are adverse at the early stages of capital account liberalization, they certainly become positive after a turning point.

The relationship between capital account liberalization and poverty has been examined in the literature by focusing on the relationship between capital account liberalization and growth with the further assumption that higher growth alleviates poverty, without paying direct attention to poverty. Liberalization of the capital account is thought to have positive effects on economic growth and thereby on poverty. There are a number of channels through which capital account liberalization may increase economic growth: through higher investment, as capital flows in to earn higher returns (Prasad et al, 2003; see, also, Henry, 2007; and Henry and Sasson, 2008); by lowering the cost of capital via improved risk allocation (Prasad et al, 2003; Bekaert, Harvey and Lundblad, 2000, 2001); through investment in higher risk but higher return projects with the help of global diversification of risk (Obstfeld, 1994); through increased efficiency and productivity via transfer of technology and managerial know-how (Prasad et al, 2003; Agénor, 2002); through increasing incentives, which improve the regulatory and supervisory framework of banking; this is helped by letting foreign banks introduce a variety of new financial instruments and techniques or by increasing competition, which can improve the quality of financial services (Prasad et al, 2003); and through the

'discipline effect', whereby governments are forced to pursue better macroeconomic policies (Tytell and Wei, 2004; Stiglitz, 2000).[3]

It is just as possible that the capital account liberalization can slow down growth by eliminating country-specific income risk and the impact of this risk on saving. When countries share endowment risk via international capital markets, saving and growth rates can be lower in financial openness than in autarky (Devereux and Smith, 1994). Rodrik (1998), using data on developing as well as developed countries, finds no significant effect of capital account liberalization on the percentage change in real income per capita over the period 1975 to 1989. Edwards (2001) observes that the positive relationship between capital account openness and productivity performance manifests itself only after the country in question has reached a certain degree of development. At very low levels of domestic financial development a more open capital account may even have a negative effect on performance. Edison et al. (2002) find mixed evidence that capital account liberalization promotes long-run economic growth and that the positive effects are most pronounced among countries in East Asia. A more recent study by Jeanneney and Kpodar (2008), as mentioned before, argues that the standard financial liberalization effect of the McKinnon (1973) type is directly effective in reducing poverty, as is the more indirect effect via economic growth. But there are costs as well. Financial liberalization promotes financial instability; moreover the poor do not benefit from the greater availability of credit. Ultimately, though, the authors argue that the benefits outweigh the cost for the poor.

It is, thus, not quite clear whether the relationship between capital account liberalization and poverty is negative as one might expect. The purpose of this paper is to investigate this relationship further through an empirical investigation of the direct relationship between capital account liberalization and poverty, thereby bypassing the required further assumption that growth and poverty are negatively linked. In this study, we are also interested in the relationship between institutional quality and poverty. The literature on institutions has stressed that low-income countries lack a well-developed incentive structure to bring forth productive cooperation (Olson, 1996). Such a structure depends not only on economic policies but also on the quality of the institutional arrangements (see, also, World Bank, 2001). One such arrangement is a legal system that enforces contracts impartially and makes property rights secure over the long run. Another is a system of political structure, constitutional provisions, and good enforcement to monitor the extent of special-interest lobbies and cartels. In countries where institutional mechanism defined in this sense is not working properly, one would expect to see a small group of elites to reap the benefits of growth and liberalization.

We can easily link poverty to financial liberalization and institutional quality and build relevant hypotheses, as this is undertaken below (see section 4). Is it the case that financial liberalization has beneficial effects on the poor in countries where the institutional quality is high and the poor can share the benefits of liberalization with the rest of the population? Another hypothesis is that increasing financial openness hurts the poor; however, such detrimental side effects can be alleviated, at least to some extent, when good institutions are in place.

[3] A related but different suggestion supports the idea of creating a global pool of reserves out of countries' income with the specific aim to provide more sustained development finance to fight against poverty (Stiglitz, 2002).

3. Measuring Poverty, Capital Account Liberalization and Institutional Quality

3.1 Measuring Poverty

The data source is the World Development Indicators of the World Bank. The poverty data are available from *PovcalNet* at http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp. The poverty line used in this paper is twice the extreme poverty line, which is set at $1.08 per day ($32.74 per month) in 1993 PPP prices. By using this measure, "…we count as poor all those who would be judged so by standards more typical of middle-income countries" (Chen and Ravallion, 2004).

The headcount poverty index is an important descriptive tool. Although it lacks some desirable properties, it is easy to understand and interpret. Mainly due to its simplicity, it has become a standard measure in academic and policy work. Therefore we have chosen to use it as our poverty indicator.

As part of our robustness checks, we use the income share of the poorest 20% of the population as a measure of poverty. Unlike the headcount index, it is a relative measure of poverty. This measure has been used in the development literature widely (see for instance Beck et al., 2007).

3.2 Measuring Capital Account Liberalization

We adopt the definition in Kaminsky and Schmukler (2003). The liberalization of the capital account is captured by the regulations on offshore borrowing by financial institutions and by non-financial corporations, on multiple exchange rate markets and on capital outflow controls. In a fully liberalized capital account regime, banks and corporations are allowed to borrow abroad freely. They may need to inform the authorities but permission is granted almost automatically. Reserve requirements might be in place but are lower than 10 percent. Also, there are no special exchange rates for either the current account or the capital account transactions; nor are there any restrictions to capital outflows.

As mentioned by a number of authors (such as Edison et al., 2002), it is not easy to measure the extent of openness in capital account transactions. The difficulty lies in capturing the complexity of real-world capital controls. First, conventional measures of quantifying capital controls sometimes fail to account for the intensity of capital controls. The most prominent example of these measures is the binary variable measure based on the IMF's categorical enumeration reported in *Annual Report on Exchange Arrangements and Exchange Restrictions* (*AREAER*). The second problem is that the IMF-AREAER based variables are not capable of representing the intricacy of actual capital controls. Capital controls can be placed on inflows or outflows as well as on the type of the financial transaction. The third problem is that it is almost impossible to distinguish between *de jure* and *de facto* controls on capital transactions. Capital control policies are often implemented without explicit policy goals to control the volume and/or the type of capital flows. Furthermore, it is often the case that the private sector circumvents capital account restrictions, invalidating the expected effect of regulatory capital controls (see Edwards, 1999). For these reasons, researchers often look at the degree of financial integration among countries and interpret it as *de facto* restrictions on capital transactions (see Rajan and Zingales, 2003).

In this study, we use the capital account openness index, *KAOPEN* developed by Chinn and Ito (2002). This index is the first principle component of four IMF-AREAER binary variables. These four variables are defined as follows: k_1 is the variable that indicates the presence of multiple exchange rates; k_2 is the variable that indicates restrictions on current account transactions; k_3 is the variable that indicates the restrictions on capital account transactions; and k_4 is the variable that indicates the requirement of the surrender of export proceeds. The sum of these four variables is equal to one when the capital account restrictions do not exist, so that the index shows financial openness rather than controls. For controls on capital transactions (k_3), the index uses the share of a five-year window (encompassing year t and the preceding four years) that capital controls were not in effect ($SHAREk_3$) so that:

$$SHAREk_{3,t} = (k_{3,t} + k_{3,t-1} + k_{3,t-2} + k_{3,t-3} + k_{3,t-4}) / 5$$

As mentioned in Chinn and Ito (2002), one of the merits of the *KAOPEN* index is that it attempts to measure the intensity of capital controls, insofar as the intensity is correlated with the existence of other restrictions on international transactions. By the nature of its construction, one may argue that the *KAOPEN* index measures the 'extensity' of capital controls because it may not directly refer to the stringency of restrictions on cross-border transactions, but to the existence of different types of restrictions. However, measuring the 'extensity' of capital controls may be a good proxy to the measure of intensity of capital controls. Consider a country with an open capital account. It may still restrict the flow of capital by limiting transactions on the current account restrictions or other systems such as multiple exchange rates and requirements to surrender export proceeds. Alternatively, countries that already have closed capital accounts might try to increase the stringency of those controls by imposing other types of restrictions (such as restrictions on current account and requirements for surrender of trade proceeds), so that the private sector cannot circumvent the capital account restrictions. Another merit of this index is its wide coverage (more than 100 countries) for a long time period (1970 through 2000).

By the nature of its construction, the *KAOPEN* index is considered to be a *de jure* measure of financial openness because it attempts to account for regulatory restrictions on capital account transactions. Hence, this index is different from price-based measures on financial openness, often referred to as *de facto* measures of financial integration. These two types of financial openness measures have their own strengths and weaknesses. However, it is almost impossible not only to rank the supremacy of these measures, but also to distinguish them. One of the drawbacks of the *de jure* measures on financial openness, as Edwards (1999) discusses, is that it is often the case that the private sector circumvents capital account restrictions; thereby nullifying the expected effect of regulatory capital controls, which can be captured by price-based measures. A drawback of the price-based measures, on the other hand, is that the measures, especially those based on the interest rate parity conditions, can reflect changes in macroeconomic conditions even if there are no regulatory changes on capital account transactions.

Clearly, the measurement of the extent of capital account controls is difficult. Many researchers have tried to capture the complexity of real-world capital controls, with varying degrees of coverage, and varying degrees of success. For reviews and comparisons of the various measures on capital controls utilized by a number of researchers, one might refer to Edwards (2001), Edison et al. (2002) and Eichengreen (2002).

One might argue that a *de jure* measure is ineffective in the sense that releasing controls do not necessarily lead to more cross-border transactions. The response to such concerns is that the factors determining the magnitude of capital flows are many. The investment climate in the country, as well as the culture might influence capital inflows. The policy tool that is most directly related to the regulation of capital account transactions is capital account liberalization, i.e. eliminating the barriers to allow access. Whether a change in the rules helps increase the magnitude of capital flows is another question. Since this paper focuses on regulatory aspects of capital account openness, we think the KAOPEN index is an appropriate indicator.

The KAOPEN index was used by Chinn and Ito (2002 and 2006) in their studies of the determinants of financial development. These researchers found that the rate of financial development, as measured by private credit creation and stock market activity, is linked to the existence of capital controls, and that a higher level of financial openness contributes to the development of equity markets only if a threshold level of institutions is attained, which is more prevalent among emerging market countries.

In figures 1 to 6 we have graphed the KAOPEN index and the poverty rate for the six World Bank regions merely to get a first impression of their relationship. A quick glance of this simplest possible relationship that can be adduced clearly suggests that it does not appear to be the case that the relationship adheres to the theory that underpins this relationship. This suggests that fuller and more systematic investigation is in order. This we undertake immediately below in section 4.

3.3 Measuring institutional quality

The institutional quality data come from the PRS Group, a private organization.[4] This organization maintains various datasets. One is the IRIS dataset, which includes the following variables for the 1982-1997 period: corruption in government, rule of law (law and order tradition), bureaucratic quality, ethnic tensions, repudiation of contracts by government, and risk of expropriation.[5] In our cross-country regressions, we use the risk of expropriation as our institutional quality indicator. It is defined as the risk of 'outright confiscation and forced nationalization' of property and its values range from 0 to 9. Lower ratings are given to countries where expropriation of private foreign investment is a likely event. In such countries, specific interest groups may be favoured, leading to a situation in which only these favoured groups collect the benefits of economic development. The majority may experience stagnant or declining life standards, causing the poverty rate to be high. This line of thinking predicts higher institutional quality to be correlated with lower poverty rates. However, the case is not trivial. It is possible that an institutional reform may impose high transaction costs on the poor and thus increase the poverty rate, as mentioned by Chong and Calderon (2000a). After the reform, the poor have to learn new mechanisms to survive, as the former

[4] Since its founding, PRS has focused on political risk analysis, offering two unique and independent, publicly available methodology models, *Political Risk Services* and *International Country Risk Guide (ICRG)* and many related products and services. For more information, see http://www.prsgroup.com.

[5] 'Contract Viability/Expropriation risk' is a subcomponent of the 'Investment profile' variable of the ICRG dataset, described below.

mechanisms are no longer useful. Such transaction costs may be high, especially for the poorest and the least educated.

The 'risk of expropriation' variable has been used by Acemoglu et al. (2001) in their analysis of the effects of institutions on economic performance. It was also used by Chong and Calderon (2000b), along with the other indicators in the IRIS dataset. In their study, this variable is the indicator of institutional quality with the highest explanatory power on the poverty rate.

Another dataset, which can be obtained from the PRS Group, is the International Country Risk Guide (ICRG), which has 22 variables in three subcategories of risk: political, financial, and economic. These data are available for the 1984-2007 period and therefore appropriate for the panel data analysis. The political risk data include variables such as investment profile, corruption, law and order and bureaucracy quality. To be consistent with our choices of institutional quality in the cross-sectional and panel analyses, we employ the investment profile variable as an indicator of institutional quality in our panel data analysis. This variable ranges from 1 to 12 where higher values indicate lower risk.

4. Empirical Strategy and Evidence

4.1 Empirical Strategy

A glance at the data presented in Table 1 shows that countries have very different experiences regarding capital account liberalization, growth, institutional quality and poverty. Countries such as Thailand and China experienced large reductions in poverty and high growth rates with relatively closed capital accounts. Panama had an open capital account, moderate growth rate and a moderate reduction in poverty rate. Chile is a country with good institutions that achieved substantial reduction in poverty with substantial liberalization and high growth rate. Uganda liberalized its capital account with not much change in poverty rates. In short, liberalizing the capital account does not appear to be a necessary condition for growth and poverty reduction.

We attempt to answer two main questions in this study. The first is whether the countries with higher levels of capital account openness have lower poverty rates. The second question is whether the effect of capital account openness on poverty depends on the level of institutional quality in the country. The period of investigation for the purposes of this study is 1985-2005. This is entirely determined by the availability of data. It is actually the longest time span for which data exist for most of the variables that are included in our estimable relationships.

We follow two empirical strategies; cross-country analysis and panel data analysis. As described in more detail below, in the cross-country analysis we take period averages of all variables, thereby reducing the dataset to include only one observation per country. In contrast, the panel data analysis involves building several non-overlapping sub-periods. As mentioned in the literature (for example, by Demirgüç-Kunt and Levine, 2008, among others), when compared to the cross-country approach, the panel data approach has some important advantages and one disadvantage. As a first advantage, with panel data we can make use of both the time-series and the cross sectional variation in the data. A second advantage is that in the cross-country regression, the unobserved country-specific effect is part of the error term

so that correlation between the error term and the explanatory variables results in biased coefficient estimates. Furthermore, if the lagged dependent variable is included among the regressors, which is usually the case in cross-country regressions, then the country-specific effect is certainly correlated with the regressors. To control for the presence of unobserved country-specific effects, the traditional method is to first-difference the regression equation to eliminate the country-specific effect and then use instrumental variables to control for endogeneity. This approach is known to eliminate biases due to country-specific omitted variables.

Another advantage of panel data analysis, and a disadvantage of cross-country analysis, is that the latter model with instrumental variables does not control for the potential endogeneity of all the regressors. Uncontrolled endogeneity can lead to inappropriate inferences on the coefficient of main interest. The panel data approach takes care of the endogeneity problem by using lagged values of the regressors as instruments. The main problem associated with panel data analysis is using data averaged over shorter time periods. This means that estimation results show us shorter-term effects and probably not long-term effects, which should be kept in mind when comparing the cross-country estimates with the panel estimates.

4.2 Empirical Results

4.2.1 Cross-country regressions

To conduct a cross-country analysis, and thereby explain the change in poverty, we specify our model as follows:

(1) $$P_i^T = \beta_0 + \beta_1 P_i^0 + \beta_2 KAOPEN_i + \beta_3 I_i + X_i\Gamma + \varepsilon_i$$

or, equivalently,

(1') $$P_i^T - P_i^0 = \beta_0 + (\beta_1 - 1) P_i^0 + \beta_2 KAOPEN_i + \beta_3 I_i + X_i\Gamma + \varepsilon_i$$

where P is the poverty rate, KAOPEN is the capital account openness index, and I is the institutional quality indicator. In the regression equation, P_i^0 and P_i^T are the initial and end-of-period poverty measures, respectively. We include the initial poverty measure as a regressor for two reasons. First, poverty rates usually change very slowly; and secondly, having such a regressor helps control for the country-specific factors that explain poverty in the particular country.

The matrix Γ includes various control variables such as the natural logarithm of initial per capita income [ln(Y)] and region dummies. All other variables in this matrix are expressed as their period averages. These variables are: (1) 'Growth', the growth rate, included since we are interested in estimating the direct effect of capital account liberalization after controlling for the growth effect. This is expected to have a negative sign; (2) 'Fertility', the fertility rate, which is expected to have a positive sign since larger households are expected to be poorer; (3) 'Schenrol', secondary school enrolment rate (% of gross), and (4) 'Primary', the primary rate of schooling, which are included to control for the human capital stock and are expected to have negative signs; (5) 'Inflation', inflation rate; included to control for the macroeconomic environment and is expected to have a positive sign; (6) the 'Gini' measure

of inequality. This variable is included since the alleviating effects of growth and liberalization on poverty are thought to depend on the level of inequality. With a higher level of inequality, there are a higher number of households that can be relieved of poverty, therefore the 'Gini' variable is expected to have a negative sign; (7) 'GovCons', general government final consumption expenditure, taken as a percentage of GDP, and it is expected to have an ambiguous sign, since a higher share of government expenditure may or may not reduce poverty, depending on how the expenditure is allocated to different groups in the country; and (8) 'ln(Y)', the logarithm of per capita GDP, which is expected to have a negative sign since higher mean income is associated with lower poverty.

We also include the interaction term between the KAOPEN index and institutional quality to test for threshold effects. It is possible that the beneficial effects of capital account openness display themselves only after the country reaches a certain level of institutional quality. Another way to say this is that only countries with a certain level of institutional quality benefit from capital account openness. The interaction term helps us test for the existence of such an effect.

The descriptive statistics of the variables used in the cross-country regressions are presented in Tables 2 and 3. The descriptive statistics in Table 2 show that there is quite a degree of variation in the data utilized so that one should be confident that reasonable estimated relationships should emerge. Both the standard deviations and the minimum/maximum values tend to validate this statement. Turning to Table 3, the correlation coefficients do not appear to indicate any serious problems in terms of the relationships to be estimated. We then turn our attention to the estimated relationships.

4.2.2 OLS and IV Estimation

Equation (1) is estimated first by ordinary least squares (OLS). We report the results of equation (1) by including in addition to the main variables a number of control variables as indicated above. The estimates and the p-values of these estimates (in brackets) are reported in Table 4. Evidently, and as expected, initial poverty rate is positively related to the end-of-period poverty rate. It is also statistically highly significant in the regression. Moreover, a higher level of institutional quality is associated with a lower level of poverty. A one-point increase in the institutional quality indicator reduces poverty rate by slightly less than one percentage point. The effect is significant at 4-6% level in some regressions, but not in others. Although the coefficient estimate of the KAOPEN index takes a negative value in most regressions, meaning that higher openness is associated with lower poverty, its effect has very low levels of statistical significance in the regressions. It is true that none of the coefficients is remotely significant. The average growth rate, fertility rate and the Gini index are all statistically significant with expected signs. Higher values of average growth rate and Gini index are associated with lower end-of-period poverty rates, while a higher fertility rate is associated with higher poverty rates. The interaction effect (KAOPEN*I) is statistically insignificant. So are the education-related controls.

In column (7) of Table 4 we report the estimates of the regression that includes region dummies. There are six regions, as specified by the World Bank, namely East Asia, Eastern Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa. The Middle East and North Africa dummy is the excluded one in the regression. The coefficient estimates for these dummy variables reflect

regional differences that remain in poverty rates even after controlling for many country-specific characteristics. All of these dummy variables enter the regression with a positive sign. The Eastern Europe, South Asia and Sub-Saharan Africa dummies are statistically significant at 2%, with the rest being statistically insignificant.

In Table 4, we report, along with the number of observations, the R-squared statistic, and the p-value of Ramsey's RESET test for possible specification error. The null hypothesis for this test is that the powers of the fitted values of the dependent variable have no significance in the regression, which is rejected only for the specification in column (2). It then follows that the estimated relationships are not misspecified, and we should, thus, have confidence in the linear specification, with the mentioned exception.

Although we have specified the regression equations in such a way as to minimize endogeneity, it is still possible that capital account openness is endogenous to poverty. One could construct the argument that countries that have high poverty rates would be more willing to experiment with financial market liberalization than countries that are doing well in this respect. This would lead to an endogeneity bias in our estimates. In order to control for possible endogeneity of the KAOPEN variable and the interaction term $(KAOPEN_i * I_i)$, we use instrumental variables (IV) estimation. Various instruments, such as the legal origin of the country (Beck et al., 2000), government budget surplus, lagged per capita GDP and regional dummies (Chong and Calderon, 2000) have been used for financial development. We know of no instruments for financial, and in particular, capital account liberalization. It is not clear to us whether the instruments mentioned above are uncorrelated with the error term in our regressions, therefore we choose to use a different instrument set. The instruments that we use are the deviations of KAOPEN and the interaction term between KAOPEN and I from their region-specific means.[6] Our instruments have high correlation with the endogenous variables by construction and low correlation with the error term, under the condition that the degree of correlation of shocks to poverty in a country with KAOPEN index in that country is similar to their correlation with KAOPEN index in other countries within the region. The estimation results are presented in Table 5. Evidently, the IV estimates are not drastically different from the OLS estimates.

In Table 5, along with the coefficient estimates and their p-values, we report the p-values of the Durbin-Wu-Hausman test for endogeneity. The null hypothesis of this test suggests that OLS estimation of the equation would yield consistent estimates; that is, any endogeneity associated with the regressors would not have deleterious effects on OLS estimates. A rejection of the null indicates that the effect of the endogenous regressors on the estimated relationship is meaningful, and instrumental variables techniques are required. As can be seen in Table 5, the p-values of this test range from 0.08% to 13.9%. It thus follows that the null hypothesis can be rejected in most, but not all, cases. Although this means that the IV method should be used, OLS and IV estimates are very similar in magnitude. Therefore, for practical purposes, we may conclude that either set of equations can be used.

[6] The instrument is defined as the deviation of variable X from its region-specific mean, expressed as $X_i^M = X_i - \frac{1}{R}(\sum_{i=1}^{R} X_i)$, where X_i^M is the instrument and there are R countries in the region that country i belongs to. These instruments have high correlation with the endogeneous variables and low correlations with the error terms by construction.

We also report in Table 5 under the 'first-stage results' heading the partial R-squared statistic from the regression of the endogeneous variables on all exogeneous variables. The R-squared values are high, which indicates that our instruments are appropriate in the sense that they are very highly correlated with the endogeneous variables.

4.2.3 Panel data estimation

The previous analysis helps us determine the extent to which cross-country variation in poverty can be explained by the variation in the (exogenous part of the) KAOPEN index. However, the analysis assumes that, keeping all observable factors the same, countries have similar poverty levels, since they have similar unobserved characteristics. Even though we include the beginning-of-period level of poverty as a regressor, this may not be enough to control for unobserved heterogeneity. We would also like to know if changes over time in capital account openness of a country have any effect on poverty. Such concerns can be addressed by panel data analysis. With panel data analysis, we also increase the degrees of freedom by including the variability in time dimension.

The model in equation (1) assumes that the error term is identically distributed across countries. This may be invalid if there are strong country-specific effects that determine the level of poverty in a country. Furthermore, time effects are ignored in equation (1).

To conduct panel data analysis, we rewrite (1) as a dynamic panel regression model as follows:

$$(2) \quad P_{i,t} = \beta_0 + \beta_1 P_{i,t-1} + \beta_2 KAOPEN_{i,t} + \beta_3 I_{i,t} + X_{i,t}\Gamma + \mu_i + \lambda_t + \eta_{i,t}$$

where t stands for the period and i represents country as before. In this setting, the error term is composed of a country-specific fixed effect, μ_i, a time-specific effect, λ_t, and a time-varying random error term, the last term in equation (2).

We divide the 1985-2005 period into five non-overlapping subperiods. The five subperiods include years 1985-88, 1989-92, 1993-96, 1997-2000 and 2001-2005. All variables in the regression equation are defined as subperiod averages. Our panel has a short time dimension, but the number of cross-sectional units is large. We should mention that the estimation technique that we use is designed for data with these characteristics. The technique is called the Generalized Method of Moments (GMM) estimation, as explained below.

In our cross-country regression model, the country-specific effect μ_i is part of the error term. If μ_i is correlated with the explanatory variables, then the coefficient estimates are biased. Notice that lagged poverty rate is a regressor and it is correlated with μ_i . To solve the bias problem the country-specific effect can be eliminated by taking the first-difference of equation (2).

$$P_{i,t} - P_{i,t-1} = \beta_1 (P_{i,t-1} - P_{i,t-2}) + \beta_2 (KAOPEN_{i,t} - KAOPEN_{i,t-1}) + \beta_3 (I_{i,t} - I_{i,t-1}) + (X_{i,t} - X_{i,t-1})\Gamma + (\lambda_t - \lambda_{t-1}) + (\eta_{i,t} - \eta_{i,t-1}),$$

However, taking first differences creates another problem. In the first-differenced equation, the error term is correlated with the $(P_{i,t-1} - P_{i,t-2})$ term. The standard treatment of this problem is to use the lagged values of the explanatory variables in levels as instruments in the difference equation. This is the way we have adopted in this study.

There are two further problems regarding the estimation of equation (2) by differencing. First, the cross-country dimension of the data is lost. Second, if the regressors in equation (2) are persistent over time, then their lagged values are weak instruments for the regression in differences. This can lead to a large bias in estimates. To address these problems, we estimate the regression in differences jointly with the regression in levels using the Generalized Method of Moments (GMM) estimation. The procedure uses lagged levels of the regressors as instruments in the difference equation, and lagged differences of the regressors as instruments in the levels equation. This method, called the 'system GMM' has been proposed by Arellano and Bover (1995) and has been used in many studies (see, for example, Beck et al., 2000 and Jeanneney and Kpodar, 2008).

Another advantage of this method is that we can control for potential endogeneity of all regressors, unlike the cross-country IV regression which controls for the endogeneity of only the capital account openness variable. Controlling for the endogenity of all regressors is achieved by using the lags of all explanatory variables as instruments, called the internal instruments. The variables that are believed to be exogenous can be specified as additional instruments, which are called the external instruments. In our case, these are the time dummies. To sum up, the main arguments for using the system GMM estimation are that it does not eliminate cross-country variation, it reduces potential biases of the difference estimator in small samples, and it can control for the potential endogeneity of all regressors.

To obtain system GMM estimates, we use the 'xtabond2' command in Stata version 9.2. One useful feature of this command is that it implements the 'forward orthogonal deviations' transformation, which works as follows: instead of subtracting the previous observation from the current one, it subtracts the average of all future available observations of a variable. Regardless of the number of gaps in the data, this transformation is computable for all observations except the last for each country, so it minimizes data loss. And since lagged observations do not enter the formula, they are valid as instruments. This method is very helpful in making full use of the data in our case, since poverty data are notoriously sparse and taking differences would leave us with a very small sample size to work with (Roodman, 2006).

Our system GMM estimates are presented in Table 6. As before, the initial level of poverty has a positive sign and is statistically highly significant. A higher level of institutional quality is associated with lower poverty rates, as before, and the effect is statistically significant in most regressions. The effects of the control variables are mostly the same as before. The main differences are in the KAOPEN and Growth variables, as explained below.

In the GMM estimation, unlike the previous findings, we find that countries with more liberalized capital account regimes have higher poverty rates. This is a striking result. Although the effect is not statistically significant in all specifications, it is in some. Another major difference of these estimates from the previous ones is that the statistical significance of the growth variable has been reduced substantially. In the cross-country regressions, the estimates showed that countries with higher average growth rates during the 1985-2005

period had lower poverty rates at the end of the period, ceteris paribus. That is to say, the long-run effect of growth on poverty is clearly beneficial. Our GMM estimates are based on four-year subperiods, which are probably too short to represent the long-run. In the short run, the poverty reducing effect of growth may not be as clear.

In Table 6, we report the p-values of the Arellano-Bond second-order autocorrelation test applied to the residuals in differences (see Roodman, 2006, for more information). This test checks for the existence of first-order autocorrelation in $\eta_{i,t}$. If the $\eta_{i,t}$ terms in equation (2) are serially correlated of order 1 then, for instance, $P_{i,t-2}$ is endogenous to the $\eta_{i,t-1}$ in the error term in differences, making $P_{i,t-2}$ an invalid instrument. In such a case, one needs to use deeper lags as instruments. The p-values of the Arellano-Bond test are quite high, which means that we cannot reject the null hypothesis that there is no autocorrelation. Therefore, there is no need to restrict the instruments to deeper lags. In the same table, we also report the p-values of the Hansen test of over-identifying restrictions. With high p-values, the test fails to reject the null hypothesis, which clearly suggests that the instruments are valid. The existence of too many instruments has been shown to cause problems (Roodman, 2006). Although there is no clear guidance on how many is too many, Roodman (2006) recommends a rule of thumb, which says to keep the instrument count below the number of countries. To establish that, we restricted the lags used in the instruments in our regressions as necessary.

4.3 Further Robustness Checks

To make sure that our findings are not specific to the poverty measure that we adopt, we try an alternative measure, namely the income share of the poorest 20% of the population. We repeat the cross-sectional OLS and panel data system GMM estimations for this alternative measure. Our new results, which are reported in Tables 7 and 8, only make our previous results stronger. Based on the signs of the coefficient estimates of the KAOPEN variable obtained by OLS and GMM, we can say that a higher degree of capital account liberalization is associated with lower income share of the poorest 20% of the population, although the effect is not statistically significant in all regressions. Consistent with our previous findings, higher institutional quality is associated with higher income share of the poor, and growth increases the income share of the poor, although these effects are not statistically significant in all regressions. We therefore conclude that our findings are robust to a change in the poverty measure used in the analyses.

As another robustness analysis, we question whether a specific region is determining the results. To answer this question, we exclude the regions from the regressions one by one. Tables 9 and 10 present our findings. We pick the specifications that include the most regressors. In Tables 9 and 10, column (1) shows us the OLS estimates when East Asian countries are excluded from the regression. In the other columns, other regions are excluded. Evidently, our results are qualitatively the same. The most noteworthy changes occur when we drop Eastern European and Latin American countries from the sample, columns (2) and (3) respectively. This is to some extent due to a sizable reduction in the sample size. Estimates for the growth effect seem to be the most influenced by sample restriction.

4.4 Discussion of the Results

In general terms theory provides conflicting predictions concerning the relationship between capital account liberalization and poverty alleviation. On the one hand, by ameliorating information and transaction costs and therefore allowing more entrepreneurs to obtain external finance, capital account liberalization improves the allocation of capital, thereby exerting a particularly large positive impact on the poor. To the extent that financial systems function better as a result of capital account liberalization, financial services become available to a larger proportion of the population and to the poor. On the other hand, it is likely that capital account liberalization and improvements in the financial system primarily benefit the rich and those who are politically connected. Especially at the early stages of capital account liberalization, financial services, and credit in particular, are limited to the wealthy and well connected. A greater degree of financial globalization, then, may only succeed in channeling more capital to the few, but certainly not to the poor. A third view poses the question of a non-linear relationship between capital account liberalization and income distribution, and more specifically of an inverted U-shaped curve: at the early stages of capital account liberalization only a few relatively wealthy individuals have access to financial markets. With sustained capital account liberalization more people can afford to join the formal financial sector and thus more people can enjoy the full benefits. Thus, while the distributional effects of financial deepening are adverse at the early stages of financial globalization, they certainly become positive after a turning point. So that even if capital account liberalization leads to higher growth, it is an open question whether capital account liberalization that ensues will narrow or widen income distribution.

We have tested these propositions in the case of capital account liberalization. Theoretical propositions have been tested against data for a number of developing countries in a cross-country data set up. Relevant econometric techniques have been employed to bear on the question of whether and how capital account liberalization influences poverty. We thereby hope to have thrown a great deal of light on the conflicting theoretical issues identified above through new empirical evidence. Interestingly enough the existing empirical evidence, such as it exists, is as conflicting, if not more so than the theory, and extremely sparse at the moment. We have demonstrated that capital account liberalization does little to alleviate poverty. By contrast, it is the design of high quality institutions, and to a much lesser extent economic growth, that affect poverty alleviation. In summary, this paper proposes a way to directly test a question that has considerable policy importance. All regression results reported in Tables 4 to 8, suggest that capital account liberalization is not associated with a significant decrease in the poverty rate or an increase in the income share of the poor. In fact, liberalization of the capital account increases poverty according to the system GMM estimates. Our findings indicate also that good institutions, proxied as explained above, are associated with a decline in poverty. Furthermore, in our estimated relationships we tried to control for the possibility of endogeneity of the capital account liberalization variable. Endogeneity does not present any problems in our final results.

5. Summary and Conclusions

We have suggested in this contribution that surprisingly little work has been undertaken on the relationship between capital account liberalization and poverty. A great deal of work has been initiated and done on the relationship between financial liberalization and growth; but rather very little on one form of financial liberalization, of the capital account variety, and

poverty. We have attempted to throw some light on the latter relationship by concentrating on developing countries for which data are available.

Three important results have emerged from this attempt. We find very little evidence, if any at all, on the hypothesis that capital account liberalization alleviates poverty. The second important result is that a significant variable that would potentially have some impact on poverty is better quality of institutions. The third important result is that the initial level of economic activity as proxied by GDP is an additional significant variable. An interesting implication of our findings is that policies that can engineer better quality of the institutional set up and can also affect the level of economic activity and its distribution are by far better ways of influencing poverty in the right way. Capital account liberalization does not appear to promote reduction in poverty. These basic results must be very disappointing to the proponents of capital account liberalization.

These findings are in fact not surprising when we think about the living conditions of the poor in developing countries. These people are mostly unskilled self-employed people, working on their extremely small-sized farms, or as artisans or small-scale entrepreneurs in shops or homes. The main constraints they face are marketing, credit, insurance and infrastructure. Such needs often require competent domestic policy-making and cannot be expected to be fulfilled by foreign investors. Moreover, if the needs of these people are not met, capital account liberalization may increase their vulnerability by leaving them open to intense competition from people from the outside world.

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Appendix: Figures and Tables

Figure 1: Graphs showing the plots of the KAOPEN index versus the headcount poverty rate (East Asia)

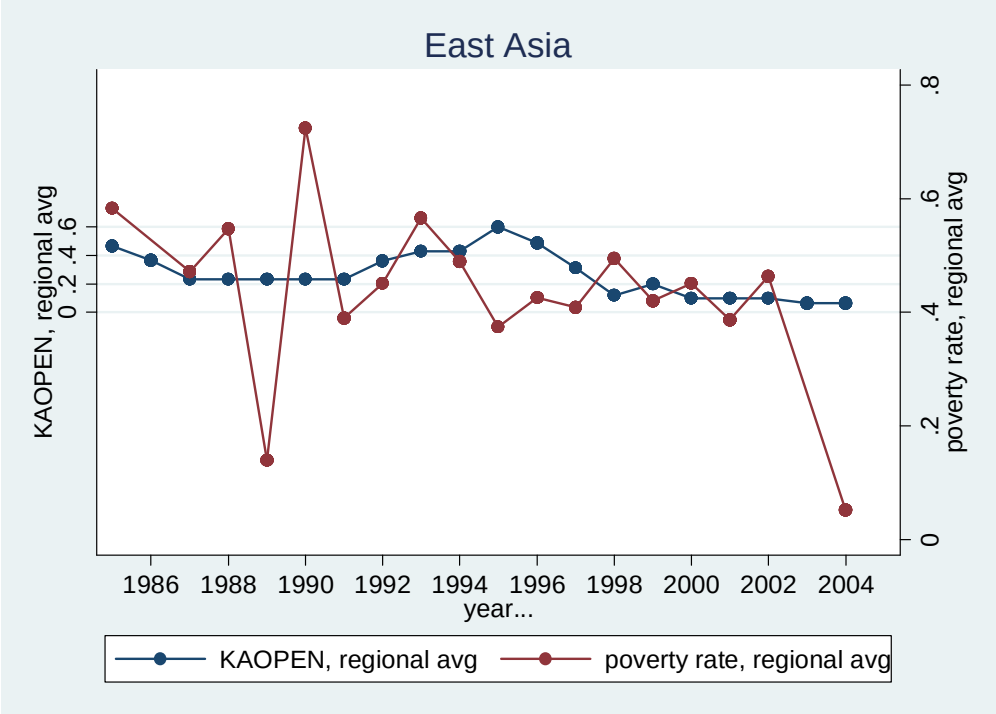


Figure 2: Graphs showing the plots of the KAOPEN index versus the headcount poverty rate (Eastern Europe)

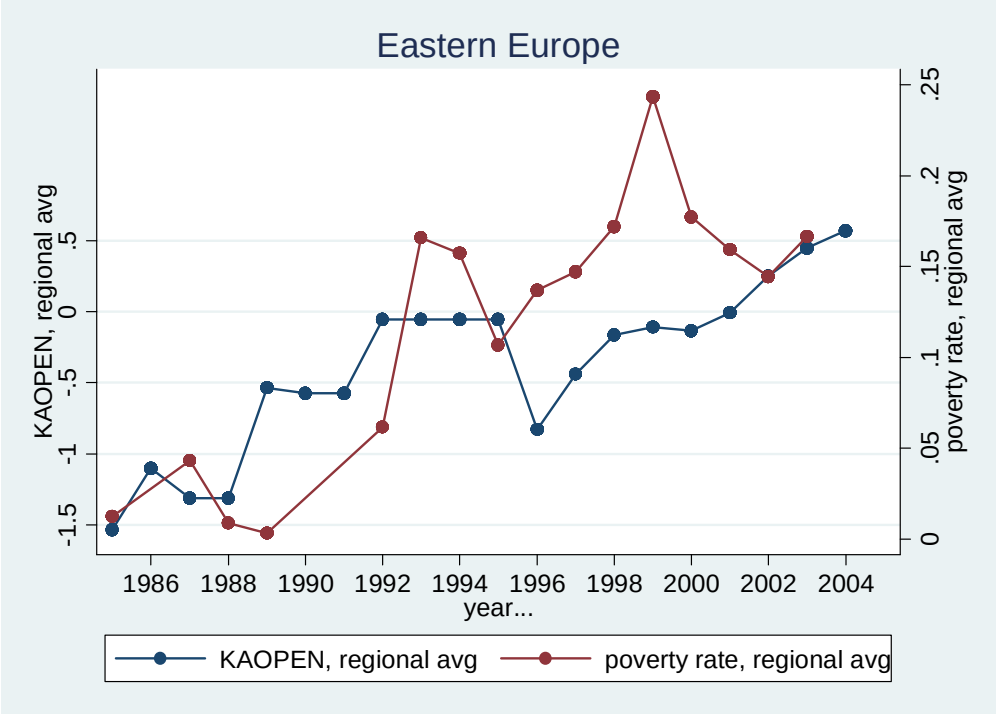


Figure 3: Graphs showing the plots of the KAOPEN index versus the headcount poverty rate (Latin America)

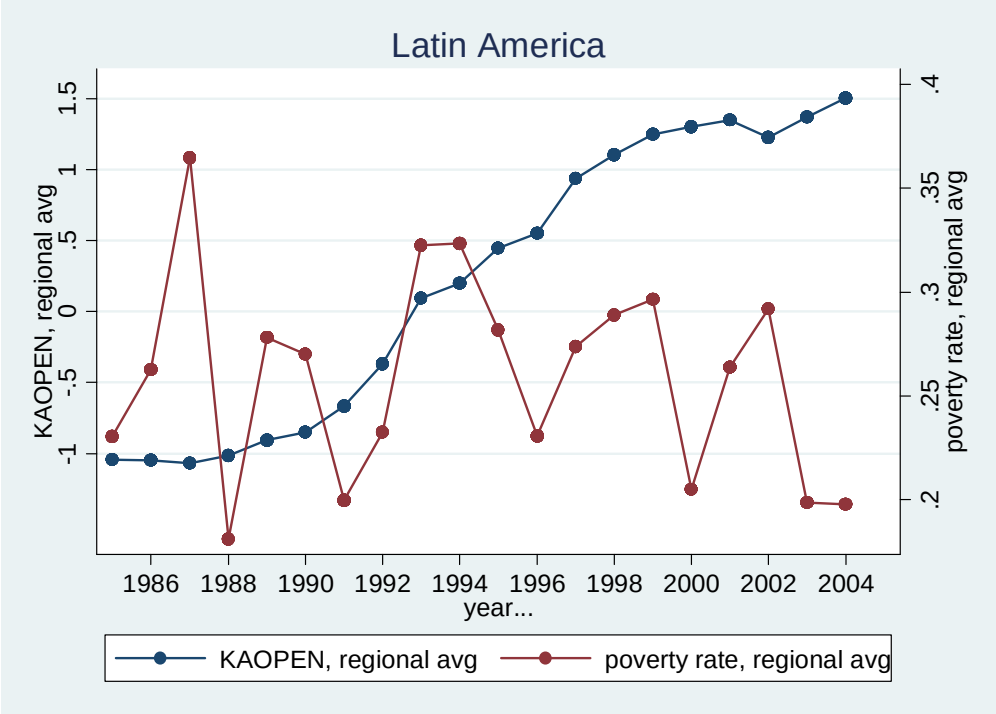
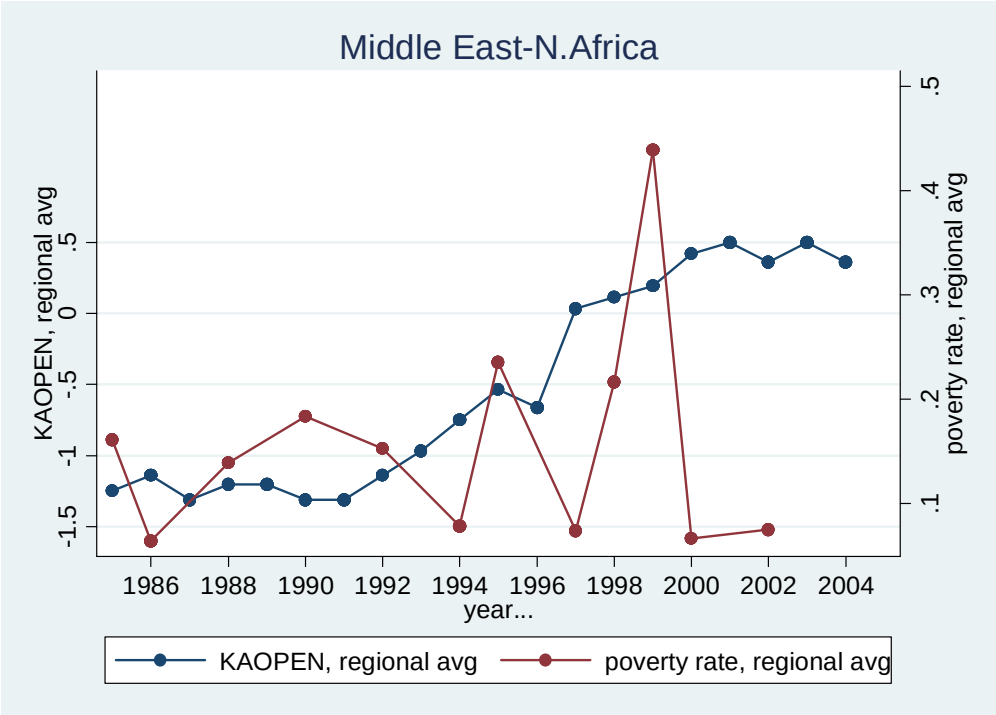


Figure 4: Graphs showing the plots of the KAOPEN index versus the headcount poverty rate (Middle East-N. Africa)



Note: The only poverty data for the 2000s are Jordan (2002) and Tunisia (2000).

Figure 5: Graphs showing the plots of the KAOPEN index versus the headcount poverty rate (South Asia)

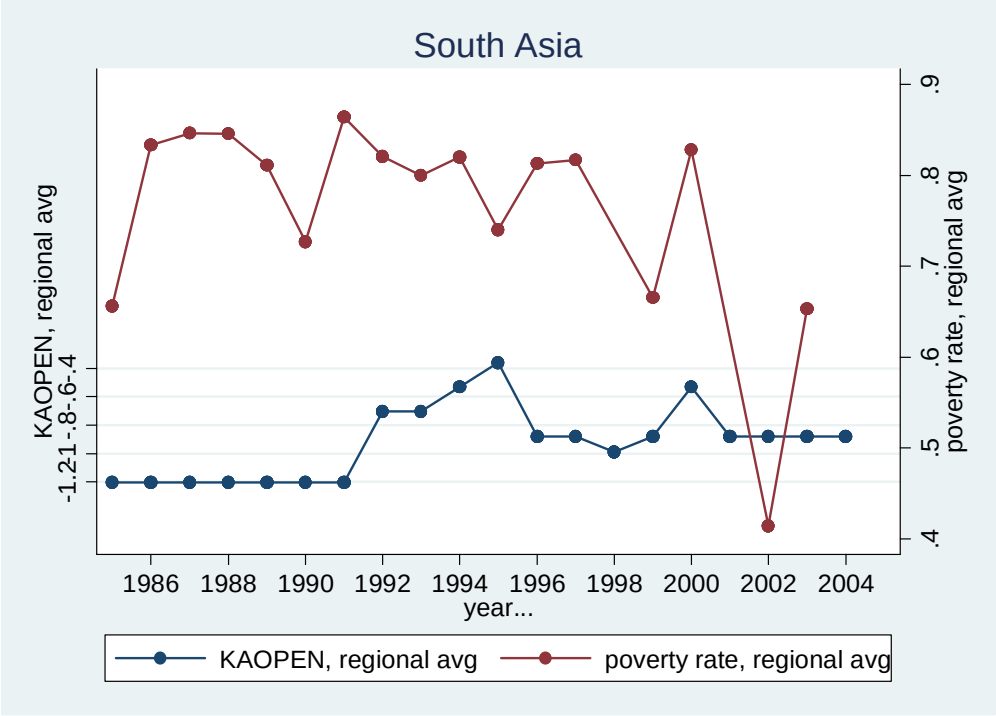


Figure 6: Graphs showing the plots of the KAOPEN index versus the headcount poverty rate (Sub-Saharan Africa)

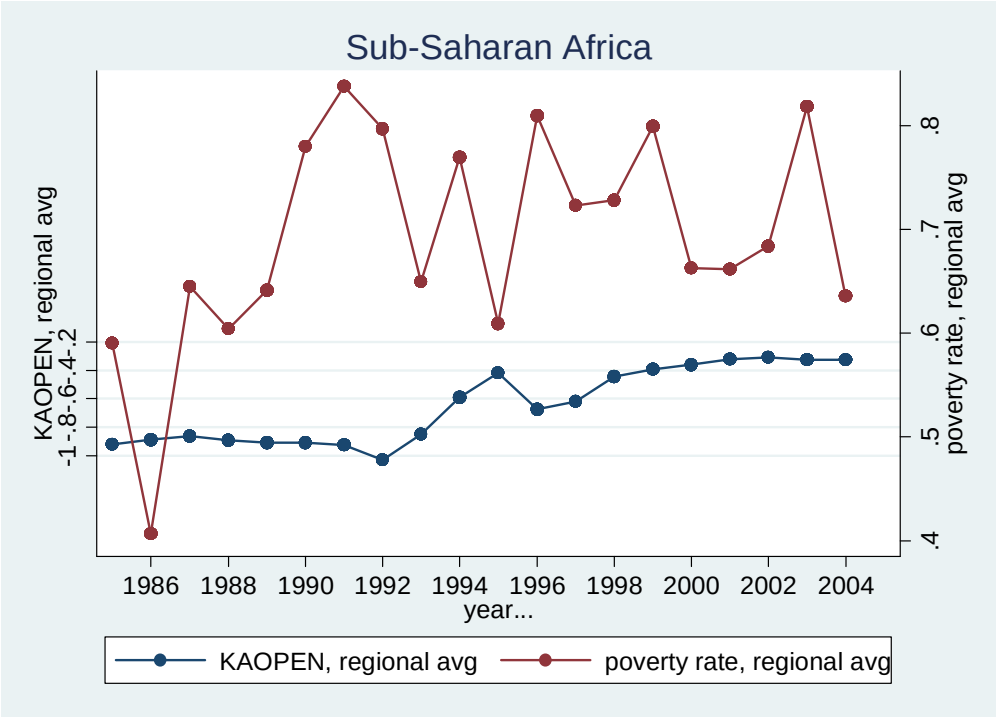


Table 1: Data on poverty, capital account openness, institutional quality and growth for the 1985-2005 period for the countries in our sample:

Country	P^0	P^T	P^T-P^0	KAOPEN	ΔKAOPEN	I	Growth
Argentina	0.01	0.18	0.16	0.17	3.44	5.9	1.28
Bangladesh	0.83	0.84	0.01	-1.22	1.70	5.4	2.32
Bolivia	0.47	0.43	-0.04	0.82	3.34	6.4	0.77
Brazil	0.30	0.21	-0.09	-1.37	1.70	6.2	0.81
Bulgaria	0.00	0.10	0.10	-1.00	0.55	7.9	1.51
Chile	0.25	0.06	-0.19	-0.96	3.27	8.2	4.19
China	0.86	0.65	-0.21	-1.29	0.66	6.8	8.36
Colombia	0.13	0.20	0.07	-1.36	0.66	6.6	1.45
Costa Rica	0.18	0.09	-0.09	-0.15	3.08	7.3	2.00
Cote d'Ivoire	0.29	0.48	0.20	-0.83	1.04	6	-1.63
Dominican Republic	0.23	0.12	-0.11	-1.27	1.96	6.8	2.60
El Salvador	0.43	0.40	-0.03	0.37	4.38	6	1.50
Guatemala	0.66	0.31	-0.35	0.73	4.38	7	1.02
Honduras	0.60	0.36	-0.24	-0.53	2.53	6.5	0.12
India	0.92	0.88	-0.04	-1.04	1.04	6.7	4.14
Indonesia	0.76	0.54	-0.22	2.11	1.49	6.4	3.38
Jamaica	0.23	0.16	-0.07	0.70	3.72	7.3	1.13
Lithuania	0.01	0.08	0.08	2.50	0.28	9.9	0.78
Mali	0.55	0.73	0.17	-0.52	1.04	5.9	1.81
Mexico	0.25	0.19	-0.06	0.33	3.00	8	0.75
Nigeria	0.91	0.92	0.01	-1.15	1.38	5.4	1.87
Pakistan	0.89	0.66	-0.22	-1.13	0.66	5.2	2.57
Panama	0.24	0.18	-0.06	2.62	0.00	6.9	1.55
Peru	0.10	0.34	0.24	0.95	4.38	6.3	0.67
Philippines	0.60	0.44	-0.15	-0.15	2.34	6.6	1.05
Poland	0.01	0.01	0.00	-0.66	1.30	7.7	3.35
Sri Lanka	0.51	0.41	-0.10	-0.04	2.34	6.6	3.35
Thailand	0.54	0.29	-0.25	-0.05	0.00	7.1	4.75
Tunisia	0.16	0.07	-0.09	-0.89	1.04	7.1	2.59
Turkey	0.16	0.16	0.00	-0.73	1.04	6.6	2.40
Uganda	0.97	0.96	-0.01	0.28	4.38	6.7	2.54
Uruguay	0.03	0.06	0.03	1.70	2.13	7.9	1.78
Venezuela, RB	0.20	0.34	0.14	0.16	4.10	5	0.02

Note: The reported values are the initial headcount poverty rate, the end-of-period poverty rate, the change in the poverty rate, average CA openness (KAOPEN index) during the period, the change in CA openness during the period, the average institutional quality (investment profile in the ICRG data) and the average growth rate, respectively.

Table 2: Descriptive statistics of the variables used in the cross-country regressions

Variable	Mean	Std.Dev.	Min	Max
$\mathbf{P^T}$	0.2799	0.2450	0.0049	0.9228
$\mathbf{P^0}$	0.2614	0.2918	0.0000	0.9091
KAOPEN	-0.0861	1.2029	-1.4604	2.6233
I	5.2550	1.4420	2.0000	9.0000
ln(Y)	8.2551	0.7782	6.4772	9.3458
Growth	1.7468	2.1715	-4.9257	8.3551
Fertility	3.0369	1.5362	1.4795	7.2155
Schenrol	71.8104	23.9062	14.8719	98.7621
Inflation	81.7280	147.1903	0.9050	594.5378
Gini	40.5105	9.5963	25.7714	59.6100
GovCons	13.9245	4.4298	4.6470	24.4352
Primary	86.2002	17.4258	22.4224	102.2952

Table 3: Correlation matrix of the variables used in the cross-country regressions

	P^T	P^0	KAOPEN	I	ln(Y)	Fertility	Schenrol	Inflation	Gini	GovCons	Primary	Growth
P^T	1											
P^0	0.8496	1										
KAOPEN	-0.1934	-0.1649	1									
I	0.0231	0.1336	-0.0907	1								
ln(Y)	-0.8206	-0.7952	0.2539	-0.0346	1							
Fertility	0.6871	0.6304	-0.1035	0.1573	-0.7009	1						
Schenrol	-0.7333	-0.7618	0.2068	-0.147	0.7889	-0.8634	1					
Inflation	-0.2059	-0.3084	-0.1555	-0.1309	0.3413	-0.2073	0.3736	1				
Gini	0.132	0.2564	0.024	0.3185	-0.0363	0.3992	-0.3076	0.0278	1			
GovCons	-0.3656	-0.4625	0.0873	-0.4536	0.3391	-0.2452	0.3579	0.1772	-0.3043	1		
Primary	-0.5414	-0.491	0.1557	-0.0936	0.5585	-0.8011	0.8557	0.3134	-0.2187	0.1596	1	
Growth	0.1263	0.3822	-0.1399	-0.0017	-0.3414	-0.1072	-0.1413	-0.243	-0.1825	-0.3085	0.1196	1

Table 4: OLS Regression coefficient estimates and p-values (in parentheses)

Dependent variable: Headcount index	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
P^0	0.718	0.503	0.795	0.722	0.673	0.654	0.606	0.798	0.683
	(0.000)	(0.000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
KAOPEN	-0.009	0.003	-0.013	-0.010	-0.005	-0.007	-0.002	-0.009	0.004
	(0.4735)	(0.7947)	(0.2252)	(0.3563)	(0.6455)	(0.5069)	(0.8710)	(0.5240)	(0.7784)
I	-0.008	-0.004	-0.009	-0.009	-0.007	-0.008	-0.006	-0.009	-0.008
	(0.1828)	(0.4309)	(0.0660)	(0.0522)	(0.2503)	(0.1523)	(0.2687)	(0.0438)	(0.1862)
KAOPEN*I								-0.002	-0.004
								(0.6413)	(0.3357)
ln(Y)		-0.115							
		(0.0194)							
Growth			-0.031	-0.028	-0.028	-0.027	-0.026	-0.031	-0.028
			(0.0001)	(0.0003)	(0.0065)	(0.0030)	(0.0027)	(0.0001)	(0.0071)
Schenrol				-0.001					
				(0.3523)					
Inflation					0.000				0.000
					(0.6425)				(0.6287)
Fertility					0.047	0.040			0.048
					(0.0434)	(0.0081)			(0.035)
GovCons					-0.006	-0.006			-0.007
					(0.1864)	(0.2157)			(0.1553)
Gini					-0.006	-0.005			-0.006
					(0.0059)	(0.0026)			(0.0052)
Primary					0.001				0.001
					(0.6194)				(0.5645)
East Asia dummy							0.105		
							(0.1136)		
Eastern Europe dummy							0.070		
							(0.0088)		
Latin dummy							0.047		
							(0.1621)		
South Asia dummy							0.233		
							(0.0125)		
Sub-Sah.Africa dummy							0.291		
							(0.0009)		
R-squared	0.7852	0.8253	0.8395	0.8431	0.8855	0.8809	0.8897	0.8398	0.8872
Number of obs.	49	49	49	49	48	49	49	49	48
Ramsey's Reset	0.1168	0.0073	0.1341	0.338	0.3835	0.3791	0.8154	0.1431	0.4845

Notes: All regressions include a constant.
- In all regressions, standard errors are robust to the presence of arbitrary heteroskedasticity.
- The countries included in the cross-country regressions are Argentina, Bangladesh, Bulgaria, Belarus, Bolivia, Brazil, Chile, China, Cote d'Ivoire, Colombia, Costa Rica, Dominican Republic, Estonia, Guatemala, Honduras, Croatia, Hungary, Indonesia, India, Jamaica, Jordan, Kazakhstan, Kyrgyz Republic, Sri Lanka, Lithuania, Latvia, Moldova, Mexico, Mali, Mauritania, Nigeria, Pakistan, Panama, Peru, Philippines, Poland, Romania, Russian Federation, El Salvador, Thailand, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Uzbekistan, and Venezuela.

Table 5: Instrumental variables (IV) regression coefficient estimates and p-values (in parentheses) Dependent variable: Headcount Index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
P^0	0.728	0.496	0.802	0.720	0.678	0.656	0.802	0.690
	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***
KAOPEN	0.006	0.016	-0.001	0.000	0.000	-0.002	-0.002	0.010
	(0.653)	(0.209)	(0.921)	(0.964)	(0.965)	(0.806)	(0.859)	(0.556)
I	-0.008	-0.004	-0.009	-0.009	-0.007	-0.008	-0.009	-0.008
	(0.174)	(0.461)	(0.053) *	(0.036) **	(0.228)	(0.123)	(0.023) **	(0.186)
KAOPEN*I							-0.003	-0.004
							(0.376)	(0.395)
ln(Y)		-0.123						
		(0.004) ***						
Growth			-0.030	-0.028	-0.028	-0.027	-0.030	-0.028
			(0.000) ***	(0.000) ***	(0.002) ***	(0.001) ***	(0.000) ***	(0.000) ***
Schenrol				-0.001				
				(0.249)				
Inflation					0.000			0.000
					(0.520)			(0.482)
Fertility					0.046	0.041		0.047
					(0.021) **	(0.002) ***		(0.012) **
GovCons					-0.006	-0.006		-0.007
					(0.133)	(0.170)		(0.085) *
Gini					-0.006	-0.005		-0.006
					(0.001) ***	(0.001) ***		(0.001) ***
Primary					0.001			0.001
					(0.640)			(0.524)
Number of obs	49	49	49	49	48	49	49	48
R-squared	0.7807	0.8224	0.8369	0.8409	0.885	0.8806	0.836	0.8867
Durbin-Wu-Hausman p-value	0.0008	0.0024	0.0024	0.0037	0.0405	0.0885	0.1391	0.0803
1st-stage results:								
Instrument 1 **(Partial R^2)**	0.9169	0.9188	0.92	0.9242	0.948	0.9511	0.9427	0.9416
Instrument 2 **(Partial R^2)**							0.8947	0.909

Notes: All regressions include a constant.
- Instruments: Deviations of KAOPEN and (KAOPEN*I) from their region-specific means as explained in the text.
- The countries included in this Table are the same as reported in 'Notes' to Table 4.
- In all regressions, standard errors are robust to the presence of arbitrary heteroskedasticity.
- The first-stage results include Shea's 'partial R-squared' measure of instrument relevance that takes intercorrelations among instruments into account.

Table 6: System GMM coefficient estimates and p-values (in parentheses) Dependent variable: Headcount index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
P^0	0.887	0.903	0.689	0.796	0.771	0.691	0.769
	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***
KAOPEN	0.012	0.011	0.003	0.010	0.018	0.015	0.013
	(0.090) *	(0.060) *	(0.700)	(0.374)	(0.044) **	(0.110)	(0.098) *
I	-0.011	-0.006	-0.009	-0.013	-0.013	-0.013	-0.011
	(0.048) **	(0.273)	(0.103)	(0.042) **	(0.003) ***	(0.021) **	(0.028) **
Growth		-0.742	0.073	0.458	-0.472	-0.287	-0.783
		(0.044) **	(0.895)	(0.415)	(0.339)	(0.598)	(0.133)
Fertility			0.042	0.023	0.026	0.035	0.015
			(0.061) *	(0.274)	(0.138)	(0.159)	(0.502)
Inflation				0.000	0.000	0.000	0.000
				(0.846)	(0.762)	(0.362)	(0.985)
Gini					-0.003	-0.004	-0.003
					(0.106)	(0.136)	(0.112)
GovCons						-0.006	-0.002
						(0.054) *	(0.395)
Primary							-0.001
							(0.420)
Number of obs	173	172	170	170	170	170	145
No.countries	67	67	67	67	67	67	65
No.instruments	35	44	57	42	59	56	61
Arellano-Bond	0.329	0.354	0.373	0.251	0.342	0.377	0.615
Hansen test	0.325	0.478	0.557	0.534	0.526	0.472	0.668

Notes: All regressions include a constant.

- The countries whose data are included in these regressions are Argentina, Armenia, Bangladesh, Belarus, Bolivia, Brazil, Bulgaria, Burkina Faso, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Croatia, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ghana, Guatemala, Honduras, Hungary, India, Indonesia, Iran, Jamaica, Jordan, Kenya, Latvia, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mexico, Moldova,

Mongolia, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Senegal, Slovenia, South Africa, Sri Lanka, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe.

- The estimates are obtained by using the one-step system GMM estimation technique implemented by the 'xtabond2' command in Stata, version 9.2. The 'xtabond2' command allows the researcher to choose various options. We chose the orthogonal deviations option to maximize the sample size. Therefore, the estimated system of equations is composed of the levels equations, and the level equations transformed by orthogonal deviations. Since the estimation procedure assumes that errors are correlated only within countries and not across them, and since contemporaneous correlation is probably the most likely form of cross-country correlation, we included time dummies to remove time-related shocks from the error term. The use of time dummies is highly recommended (see Roodman, 2006), as it makes this assumption more plausible.

- We used two sets of instruments. The first set includes traditional IV-style instruments, which are the time dummies. The second set includes the GMM-style instruments, in which each lag of the instrumented variable acts as an instrument.

Table 7: Robustness check:
OLS Regression coefficient estimates and p-values (in parentheses)
Dependent variable: Income share of the poor

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
IncShare^0	0.7055	0.7276	0.7053	0.7783	0.3709	0.3155	0.6113	0.7176	0.5490
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0290)	(0.0692)	(0.0000)	(0.0000)	(0.0222)
KAOPEN	-0.1637	-0.1131	-0.1691	-0.1093	-0.1826	-0.1315	-0.1178	-0.4098	-0.4300
	(0.2026)	(0.3318)	(0.1997)	(0.3305)	(0.1353)	(0.2604)	(0.3080)	(0.0199)	(0.0096)
I	0.1041	0.1081	0.0970	0.0970	0.0373	0.0593	0.0769	0.1129	0.0813
	(0.1552)	(0.1079)	(0.1958)	(0.1033)	(0.4751)	(0.2421)	(0.2056)	(0.0922)	(0.1097)
KAOPEN*I								0.0900	0.0939
								(0.0068)	(0.0319)
ln(Y)		-0.4435							
		(0.1029)							
Growth			0.0297	0.0428	0.0149	0.0099	-0.0163	0.0370	0.0593
			(0.6672)	(0.5872)	(0.8590)	(0.9115)	(0.8381)	(0.5846)	(0.4371)
Schenrol				-0.0198					
				(0.0377)					
Inflation					-0.0010				-0.0008
					(0.3151)				(0.3841)
Fertility					0.1030	0.1004			0.0684
					(0.5081)	(0.4426)			(0.6647)
GovCons					0.0096	0.0086			0.0284
					(0.7244)	(0.7433)			(0.2867)
Gini					-0.1131	-0.1299			-0.0636
					(0.0169)	(0.0080)			(0.3336)
Primary					0.0000				-0.0110
					(0.9994)				(0.4784)
East Asia dummy							0.1285		
							(0.8174)		
Eastern Europe dummy							-0.6699		
							(0.0559)		
Latin dummy							-1.3315		
							(0.0019)		
South Asia dummy							-0.0616		
							(0.8932)		
Sub-Sah.Africa dummy							-0.1863		
							(0.8032)		
R-squared	0.8513	0.8671	0.8517	0.8765	0.9027	0.8936	0.8885	0.8709	0.9184
Number of obs.	41	41	41	41	40	41	41	41	40
Ramsey's Reset	0.5864	0.8404	0.5649	0.8264	0.691	0.2931	0.4282	0.5987	0.5556

Notes: All regressions include a constant.
- In all regressions, standard errors are robust to the presence of arbitrary heteroskedasticity.

Table 8: Robustness check:
System GMM coefficient estimates and p-values in italics
Dependent variable: Income share of the poor

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IncShare^0	0.8581	0.7685	0.7702	0.8618	0.0666	0.0719	0.1596
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.4320)	(0.3880)	(0.0290)
KAOPEN	-0.2147	-0.2968	-0.3118	-0.2206	-0.1236	-0.1348	-0.0735
	(0.1490)	(0.0150)	(0.0010)	(0.1450)	(0.0900)	(0.0330)	(0.2230)
I	0.0845	0.0328	0.0376	-0.0743	-0.0454	-0.0577	-0.0608
	(0.3270)	(0.7080)	(0.6400)	(0.4430)	(0.4360)	(0.2270)	(0.2010)
Growth		12.4023	13.4416	11.5619	2.9797	4.8687	2.8117
		(0.0620)	(0.0250)	(0.0440)	(0.4070)	(0.1030)	(0.3700)
Fertility			0.0845	0.0859	0.0047	0.0402	-0.0176
			(0.4950)	(0.6850)	(0.9690)	(0.6920)	(0.9060)
Inflation				0.0006	0.0001	0.0000	0.0005
				(0.4430)	(0.6540)	(0.9750)	(0.2770)
Gini					-0.2181	-0.2239	-0.2019
					(0.0000)	(0.0000)	(0.0000)
GovCons						-0.0512	-0.0376
						(0.0300)	(0.0800)
Primary							-0.0034
							(0.7340)
Number of obs	141	140	139	139	139	139	121
No.countries	61	61	61	61	61	61	60
No.instruments	35	44	57	42	59	56	61
Arellano-Bond	0.914	0.756	0.758	0.723	0.183	0.127	0.106
Hansen test	0.872	0.596	0.503	0.697	0.399	0.418	0.630

Notes: All regressions include a constant.
- The estimates are obtained by using the one-step system GMM estimation technique implemented by the 'xtabond2' command in Stata, version 9.2. The 'xtabond2' command allows the researcher to choose various options. We chose the orthogonal deviations option to maximize the sample size. Therefore, the estimated system of equations is composed of the levels equations, and the level equations transformed by orthogonal deviations. Since the estimation procedure assumes that errors are correlated only within countries and not across them, and since contemporaneous correlation is probably the most likely form of cross-country correlation, we included time dummies to remove time-related shocks from the error term. The use of time dummies is highly recommended (see Roodman, 2006), as it makes this assumption more plausible.

- We used two sets of instruments. The first set includes traditional IV-style instruments, which are the time dummies. The second set includes the GMM-style instruments, in which each lag of the instrumented variable acts as an instrument.

Table 9: Robustness check: Regional influences
OLS Regression coefficient estimates and p-values (in parentheses)

Dependent variable: Headcount index	(1)	(2)	(3)	(4)	(5)	(6)
P^0	0.654	0.667	0.719	0.638	0.651	0.774
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
KAOPEN	0.003	-0.072	0.003	-0.002	0.006	0.004
	(0.841)	(0.527)	(0.850)	(0.917)	(0.696)	(0.753)
I	-0.008	0.008	-0.016	-0.006	-0.005	-0.012
	(0.207)	(0.637)	(0.010)	(0.290)	(0.468)	(0.021)
KAOPEN*I	-0.003	0.013	-0.007	-0.002	-0.004	-0.005
	(0.440)	(0.551)	(0.193)	(0.481)	(0.341)	(0.254)
Growth	-0.029	-0.021	-0.034	-0.027	-0.026	-0.038
	(0.015)	(0.233)	(0.000)	(0.011)	(0.023)	(0.000)
Inflation	0.000	0.000	0.000	0.000	0.000	0.000
	(0.806)	(0.030)	(0.328)	(0.980)	(0.592)	(0.911)
Fertility	0.058	0.039	0.038	0.068	0.054	0.005
	(0.043)	(0.220)	(0.071)	(0.005)	(0.040)	(0.788)
GovCons	-0.008	-0.005	-0.011	-0.005	-0.005	-0.010
	(0.091)	(0.447)	(0.047)	(0.314)	(0.368)	(0.022)
Gini	-0.006	-0.006	-0.004	-0.006	-0.006	-0.004
	(0.007)	(0.063)	(0.292)	(0.004)	(0.006)	(0.028)
Primary	0.002	-0.001	0.001	0.002	0.001	0.004
	(0.416)	(0.746)	(0.729)	(0.236)	(0.576)	(0.136)
R-squared	0.8905	0.8904	0.9465	0.8907	0.8617	0.8742
Number of obs.	43	33	32	46	43	43
Ramsey's Reset	0.4814	0.436	0.4315	0.7149	0.3982	0.0859

Notes: Notes to Table 4 apply.
The OLS estimates in columns (1)-(6) were obtained by excluding one region from the regression at a time. In column (1) East Asian countries were excluded; in (2) Eastern European; in (3) Latin American; in (4) Middle Eastern; in (5) South Asian; in (6) Sub-Saharan Africa countries were excluded from the regression.

Table 10: Robustness check: Regional influences
System GMM coefficient estimates and p-values (in parentheses)
Dependent variable: Headcount Index

	(1)	(2)	(3)	(4)	(5)	(6)
P^0	0.831	0.811	0.719	0.706	0.672	0.770
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
KAOPEN	0.012	-0.008	0.014	0.020	0.020	0.011
	(0.248)	(0.590)	(0.412)	(0.207)	(0.138)	(0.360)
I	-0.017	-0.012	0.004	-0.014	-0.018	-0.015
	(0.085)	(0.286)	(0.775)	(0.260)	(0.099)	(0.261)
Growth	-0.300	-1.270	-0.803	-0.487	-0.219	-0.324
	(0.717)	(0.152)	(0.411)	(0.578)	(0.757)	(0.625)
Fertility	0.027	0.057	0.047	0.096	0.033	0.050
	(0.315)	(0.312)	(0.170)	(0.116)	(0.416)	(0.277)
Inflation	0.000	0.000	0.001	0.000	0.000	0.000
	(0.652)	(0.833)	(0.097)	(0.852)	(0.942)	(0.898)
Gini	-0.002	-0.003	-0.005	-0.008	-0.002	-0.004
	(0.356)	(0.631)	(0.528)	(0.053)	(0.500)	(0.158)
GovCons	-0.004	-0.017	-0.014	-0.005	-0.004	-0.003
	(0.373)	(0.111)	(0.080)	(0.491)	(0.444)	(0.650)
Primary	0.001	0.002	0.000	0.004	-0.001	0.000
	(0.338)	(0.430)	(0.848)	(0.168)	(0.779)	(0.992)
Number of obs	119	114	89	132	127	124
No.countries	57	50	45	61	60	52
No.instruments	31	31	31	31	31	31
Arellano-Bond	0.794	0.946	0.38	0.71	0.45	0.769
Hansen test	0.67	0.796	0.603	0.908	0.462	0.627

Notes: Notes to Table 6 apply.
The system GMM estimates in columns (1)-(6) were obtained by excluding one region from the regression at a time. In column (1) East Asian countries were excluded; in (2) Eastern European; in (3) Latin American; in (4) Middle Eastern; in (5) South Asian; in (6) Sub-Saharan Africa countries were excluded from the regression.
To keep instrument count below the number of countries, we used three period or deeper lags of the regressors as instruments.