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**ON THE IMPACT OF ECONOMIC DEVELOPMENT, TRADE AND
INVESTMENT OPENNESS ON INCOME INEQUALITY**

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1) Introduction

The rapid economic growth of developing countries which opened their markets to free international trade during the past two decades has stimulated a large empirical and theoretical literature on the impact of trade on growth. There seems now to be overwhelming evidence of a link between openness and growth, at least in the 1970s and 1980s. There have been however fewer studies analyzing the impact of international trade on income inequality within countries. Although there is an important literature, both theoretical and empirical, which has looked at the link between the level of economic development and overall income inequality (what is usually called the Kuznets Curve or the inverted-U relationship between per-capita G.D.P and inequality) most of the studies first did not integrate the potential impact of international trade, second looked mainly at the impact of development on total inequality, without analyzing in details the impact economic growth has on inequality between and within different sectors, such as urban and rural areas.

There is therefore a need for detailed and careful work on the impact of economic growth and international trade on inequality between and within specific sectors of the economy and this is precisely the purpose of the present study. More precisely we attempt to analyze the specific impact of the level of development (measured by the real per capita G.D.P.) and of the degree of openness to international trade and investment flows, on the overall level of income inequality as well as on the within and between areas (urban versus rural) inequality.

The paper is organized as follows. Section 2 reviews the literature, both theoretical and empirical, on the link between inequality and development as well as that on the impact of trade on inequality. Section 3 and 4 describe respectively the methodology and the data sources while section 5 presents the results of the regressions that analyze the effect of the level of development and of the degree of openness to international trade and to international investment on overall inequality as well as on the inequality between and within urban and rural areas. A short conclusion summarizes the main findings of the study.

2) A Review of the Literature:

Un) The Impact of Development on Inequality:

*** Theoretical Studies**

Following Kuznets' (1955) pathbreaking study numerous authors in the 1960s and 1970s attempted either to formalize Kuznets' hypothesis or to check its empirical validity. In the early 1980s interest in the link between income inequality and development declined. In recent years, however, there has been a clear resurgence of research in this field, essentially for three reasons: the appearance of the so-called "new growth" theories, the application of the theory of public choice to new areas and the availability of more sophisticated data sets. This section presents a quick and non-exhaustive review of the various theoretical explanations for the existence of the Kuznets Curve while references to empirical studies on this subject will be mentioned later on.

We will successively examine three types of approaches. The first one draws on Kuznets' work and emphasizes the implications for inequality and development of the existence of a dual economy. The second type of studies belongs to the "new growth"

school and stresses mainly imperfections in the capital market, the role of investment in human capital and the so-called demographic transition. There is, finally, a third category of models which emphasizes either the role of social choices as consequences of the political system or the effect of institutional constraints which are essentially the product of history.

Kuznets' Approach and Dual Economy Models

The earliest model of this type was proposed by Kuznets (1955) who showed that "even if within-sector inequality is constant and the ratio of mean sectoral incomes is also constant, the shift of population between sectors at first produces a widening in inequality and then a narrowing" (Adelman and Robinson, 1989). While Kuznets (1955) used a numerical example, Robinson (1976) provided a more rigorous proof of Kuznets' hypothesis and his demonstration was based on the existence of intersectoral difference in mean income and did not require a higher average income or a greater level of inequality in the growing sector.

Fields (1980) considerably extended this approach by making a distinction between a sector enlargement effect, a sector enrichment effect and an interaction terms. More details on this type of model are given in Adelman and Robinson (1989) in their survey of income distribution and development.

Bourguignon (1990) proposed an interesting extension of the dual model of development in so far as the latter is stated in general equilibrium terms and hence takes into account changes in internal terms of trade (e.g., as the proportion of the population employed in the traditional sector decreases, the relative price of traditional goods is likely to rise). Moreover, in Bourguignon's analysis the emphasis is put on the Lorenz Curve and not on a specific inequality index as two indices may yield different conclusions as to the link between inequality and development.

The paper by Bourguignon and Morrisson (1990) is also an interesting contribution to the literature on the Kuznets Curve although it is not a dual economy model. In it the empirical investigation is based on a consistent theoretical framework stressing the importance of factor endowments, their ownership structure and foreign trade distortions: "Developing countries which are comparatively well endowed with mineral resources and land (climate) tend to be less egalitarian than others, although the effect of the agricultural comparative advantage may be offset by the distribution of land" (Bourguignon and Morrisson, 1990, pages 1127-28). Trade protection is another crucial variable and it leads to a worsening of the income distribution. The most important conclusion, however, is that it is the presence of exportable resources rather than GDP per capita which is an essential determinant of the income distribution, the reason being, evidently, that natural resources of this type have usually been concentrated among a few owners. In more recent periods, however, these resources have often been publicly appropriated, hence the changing level of income inequality over time.

New Growth Models and the Kuznets Hypothesis

In recent years numerous papers have attempted to analyze the implications of the so-called new growth theories for the link between inequality and development. Aghion and Bolton's (1992) for example emphasize the impact of declining interest rates as the economy accumulates capital (and grows). The idea is that at some stage it may

be possible for the poor to obtain loans, a process which ultimately may lead to a decrease in inequality.

Other models stress the role of investment in human capital. Thus, Dahan and Tsiddon (1996) argue that the original decrease in mortality rates in the demographic transition implies a decrease in the cost of child rearing per living child. This in itself leads to an increase in the number of children both among the poor and rich people but the number of rich increases at a slower rate so that the wage of the poor declines and that of the rich increases. At some stage the wage gap between rich and poor becomes large enough to encourage investment in human capital among some of the poor and income distribution becomes less unequal and this change occurs at the same time as fertility declines.

Social Choices and the Kuznets Curve

In this type of model the emphasis is on the interaction between the economic structure and the political mechanism. Most of the early models of this type assumed that political participation was exogenous. It should be stressed also that in these models the causality runs from redistribution to growth rather than from per capita GDP to income inequality.

In Persson and Tabellini's (1994) study taxes are only used for redistributive purposes. A higher tax rate depresses the after-tax return to private investment and hence growth so that income inequality is negatively correlated with subsequent growth.

In St-Paul and Verdier (1993) taxes are used for public education, the main determinant of growth, so that there is a positive correlation between growth and public expenditures on education and at the same time the income distribution becomes more equal.

More recently some models have attempted to endogenize political participation. Thus Gradstein and Justman (1997) present a model where, in the early stages of development, a small fraction of the upper income classes controls the political process so that a regressive redistributive policy occurs. Later on economic growth leads to an expansion of political participation and ultimately a progressive redistributive policy will take place and inequality will be reduced.

In Milanovic (1994) the emphasis is more on institutional constraints related to historical developments such as the extent of regional inequality in per-capita income or the importance of the state sector. The latter, for example, will tend to reduce inequality because there exists, usually, less dispersion in wages in the public than in the private sector.

**** Empirical Studies of the Relationship between Inequality and Development**

Most of the empirical literature on the Kuznets Curve has been based on cross-country estimations of the relationship between inequality and per capita national income (e.g., Adelman and Morris, 1973; Paukert, 1973; Ahluwalia, 1974, 1976a, 1976b; Ahluwalia et al, 1979; Anand and Kanbur, 1993a, 1993b; Tabatabai, 1974). Several measures of income inequality have been used in these empirical investigations (the percentage income share of the poorest 40%, Theil's two entropy indices, the squared

coefficient of variation, the Gini Index or its logit transform, the Atkinson Index or one of its decomposable transforms, the variance of the logarithm of income).

These empirical studies have also used various kinds of functional forms to test for the Kuznets hypothesis, the inequality measure being regressed on per capita income and its inverse or on per capita income and the inverse of the logarithm of income, etc. In a recent study Anand and Kanbur (1993a) have shown that each inequality index generally had a corresponding functional form of the inequality-development relationship. When they used the Gini Index, Anand and Kanbur (1993a) found that the turning point of the Kuznets curve corresponded to a per capita GDP of \$421 (1970 US dollars), on the basis of a sample of 60 countries including both developing and developed countries. In 1985 this turning point would correspond to a per capita GDP of \$1168, on the basis of the US consumer price index.

Tabatabai (1994) used as dependent variable the logit transform of the Gini Index and his results give, at the turning point, a per capita GDP at 1985 international prices of \$1,565 when the Gini Index measures the inequality between households and of \$2,422 when it measures the inequality between persons. The first case is based on 98 observations, the second on 52.

Fields and Jakubson (1994) use a combination of cross-section and panel data which includes thirty-five countries with one to nine observations per country. They first present a "pooled model" where all the data are treated as a single cross-section while in a second stage they present a "fixed effects model", the idea being that different countries may lie on Kuznets curves which have the same shape but different intercepts. They find out that in the pooled model inequality rises in the early stages of economic development while the fixed effects model always shows a negative relationship between income inequality and the level of development. These results remain robust enough not to be affected by changes in the definitions of the level of development or of the recipient unit (households versus individuals), by the addition of other countries or by several modifications of the econometric specifications. Fields and Jakubson (1994) believe that their findings may be related to the fact that in Latin American countries inequality is usually high while their per capita GDP lies in the middle of the range of countries usually included in such studies. This might explain why the inverted U curve does not show up in their fixed-effects model.

Bruno et al. (1996) present a careful review of the empirical evidence on the link between inequality and growth. They argue that it is an error to rely on cross-country data sets to draw conclusions concerning the existence of the Kuznets Curve. First, such data ignore country-level determinants of inequality. For example, past inequality is likely to be correlated with current inequality and this in itself is a source of biased estimates. Bias could also arise from differences in the type of data. Some studies, for example, combine income and consumption data. However, because of consumption smoothing, income inequality is usually higher than consumption inequality. Since for Latin American countries one had usually income data while for Asian countries, in the sixties, one had consumption data, one should not be surprised to derive an inverted U -curve linking inequality and per capita income. Bruno et al. (1996) indeed stress that, when using cross-section data covering the 1980s, that is, once Asian countries had, on average, a much higher per capita income, there was no more evidence of an inverted U -curve.

Concerning the evidence from time series, Bruno et al. (1996) argue that no clear trend emerged from a careful analysis of Indian data which included 33 household

surveys covering the period 1951 to 1991. There was, eventually, a downward trend until the mid-1960s. Finally, when combining time series and cross-section data, Bruno et al. (1996) found that 92 percent of the variance in Gini indices by country and date is a consequence of cross-section variations while only 7 percent is accounted for by variation over time.

Whereas all these studies looked at the link between the Gini Index of total income and per capita GDP or income, it might be worthwhile to see whether international trade has an independent impact on income inequality.

b) The Impact of Trade on Inequality:

The rapid economic growth of developing countries which opened their markets to free international trade during the past two decades has stimulated a large empirical and theoretical literature on the impact of trade on growth. There seems to be overwhelming evidence of a link between openness and growth, at least in the 1970s and 1980s although no correlation has been observed in any of the earlier decades, except for a negative correlation in the 1930s (Vamvakidis, 1998; for a somewhat different point of view, see Williamson, 1996). In fact international trade seems not only to have a positive impact on growth but also to facilitate the kind of convergence between the economies which is predicted by neoclassical growth models (Williamson, 1996).

Most of the literature on trade and growth however did not examine the impact of regional integration on growth. In a recent symposium on regionalism and development, the empirical evidence brought forth by Vamvakidis (1998) seems to show that countries with open, large and more developed neighboring economies grow faster than those with closed, smaller and less developed neighboring economies. Examining the impact of five Regional Integration Arrangements, he concluded also that South-South agreements among small, closed developing countries are unlikely to have a positive impact on growth while North-South agreements are more likely to have a positive growth effect on the southern partner, although this is not at all certain. Clearly more work is needed before firmer conclusions may be drawn concerning the impact of Regional Integration Agreements on economic growth.

Research on the impact of international trade on inequality within countries has been much less popular. One may cite however the work of Bourguignon and Morrisson (1990), mentioned earlier, who stressed that, *ceteris paribus*, inequality seems to be higher in countries endowed with exportable resources (probably because such resources are concentrated in the hand of a few owners)

Research on the impact of Regional Integration Agreement on Inequality has been even more scarce, although there has been some work (see Bradley et al., 1995) on the effect of the European Union on regional inequality in Europe.

Given the limited amount of research on the impact of international trade on income inequality, the present study should be a useful contribution and improve the understanding of the combined effect of growth and trade on income inequality.

3) The Methodology:

As indicated earlier the idea is to use a relatively new set of data collected by the International Labour Office which includes detailed information on the income distribution in various countries. The summary tables are presented in several versions. There is first an interesting breakdown of the income data by source of income and these figures have been recently studied by Deutsch and Silber (1998) who suggested a new approach to the analysis of the link between inequality and development (the so-called Kuznets Curve hypothesis). But the I.L.O. data give also an alternative decomposition of household (or individual) income inequality, one where the income shares corresponding to the different quantiles (these are not always deciles) of the income distribution are given separately for urban and rural households. This type of table allows us to extend our analysis of the Kuznets hypothesis, by decomposing income inequality, not by income source but by population subgroups, as will now be explained.

Let TOTG, BETG, WITHG, OVERL refer respectively to the overall value of the Gini Index of income inequality in a given country, to the between groups inequality in this country, to the within groups income inequality and finally to the residual term of the decomposition of overall inequality (this residual, also called interaction term, measures in fact the degree of overlap between the income distributions of the different population subgroups analyzed). We may then write (see, Silber, 1989) that

$$\text{TOTG} = \text{BETG} + \text{WITHG} + \text{OVERL} \quad (1)$$

Since, as indicated also in Silber (1989), the within groups inequality WITHG may be written as

$$\text{WITHG} = \sum_i P_i S_i \text{WITHG}_i \quad (2)$$

where P_i , S_i and WITHG_i denote respectively the shares of population subgroup i in the total population and total income of the country and the within group i Gini index, we may combine (1) and (2) to derive

$$\text{TOTG} = \text{BETG} + \sum_i P_i S_i \text{WITHG}_i + \text{OVERL} \quad (3)$$

On the other hand we can run the traditional type of regression analyzing the impact of per capita G.D.P on inequality (as it has so often appeared in the literature on the Kuznets Curve), but adding now variables measuring the effect of international trade. More specifically we will write that:

$$\text{TOTG}_h = a_0 + a_1 \text{GDP}_h + a_2 (1/\text{GDP}_h) + a_3 \text{TROP}_h + a_4 \text{INVOP}_h + u_h \quad (h=1 \text{ to } n) \quad (4)$$

where h refers to a given country, n to the total number of countries, GDP_h is the per capita Gross Domestic Product, TROP_h a measure of trade openness and INVOP_h an indicator of investment openness of country h .¹

¹ Since the link between per capita GDP and inequality is often non linear (the basic idea of the concept of Kuznets curve) we have introduced in addition to the G.D.P. per capita a variable equal to the inverse of the G.D.P. per capita, a formulation suggested by Anand and Kanbur (1993)

Combining (3) and (4) we may also estimate the following set of regressions:

$$\text{BETG}_h = b_0 + b_1 \text{GDP}_h + b_2 (1/\text{GDP}_h) + b_3 \text{TROP}_h + b_4 \text{INVOP}_h + v_h \quad (h=1 \text{ to } n) \quad (5)$$

$$\text{WITHG}_h = c_0 + c_1 \text{GDP}_h + c_2 (1/\text{GDP}_h) + c_3 \text{TROP}_h + c_4 \text{INVOP}_h + w_h \quad (h=1 \text{ to } n) \quad (6)$$

$$\text{OVERL}_h = d_0 + d_1 \text{GDP}_h + d_2 (1/\text{GDP}_h) + d_3 \text{TROP}_h + d_4 \text{INVOP}_h + z_h \quad (h=1 \text{ to } n) \quad (7)$$

$$\text{with } a_j = b_j + c_j + d_j \quad \text{for } j = 0 \text{ to } 4 \quad (8)$$

$$\text{and } u_h = v_h + w_h + z_h \quad \text{for } h = 1 \text{ to } n. \quad (9)$$

Moreover combining (2) and (6) way may also write that

$$\text{WITHG}^i_h = e^i_0 + e^i_1 \text{GDP}_h + e^i_2 (1/\text{GDP}_h) + e^i_3 \text{TROP}_h + e^i_4 \text{INVOP}_h + x^i_h \quad (10)$$

for $h=1$ to n and $i = 1$ to 2 (urban and rural areas) and with

$$c^i_k = \sum_{i=1 \text{ to } 2} e^i_k \quad \text{for } k=1 \text{ to } 4$$

$$\text{and } w_h = \sum_{i=1 \text{ to } 2} x^i_h \quad \text{for all } h.$$

In other words we are able to analyze the specific impact of development on inequality between rural and urban areas, on inequality within urban and rural areas and finally on the degree of overlap between the income distributions of urban and rural areas. This will give us a much finer picture of the so-called Kuznets process, if it exists.

Moreover by including trade and investment openness variables in the regressions we are also able to estimate the impact of this openness not only on overall income inequality but also on each of the various components mentioned previously (inequality between urban and rural areas, inequality within each of these areas, and overlap between the income distributions of these two areas).

4) The Data Sources:

Data on the per capita G.D.P. were taken from Summers and Heston's (1991) study and refer to the year 1988. Data on the distribution of income in urban and rural areas in various countries were obtained from a comparative study conducted by the I.L.O. (see, International Labour Office, 1992). These data allowed us to compute the overall Gini Index in each country and to derive its various components when inequality is decomposed by population subgroups, the groups referring here to urban and rural areas.

Data on the degree of openness of various countries to international trade and to international investment were borrowed from Low et al. (1999). These indices of openness are in fact corrected indices and were constructed by Low et al. (1999) in the following way. Concerning the Trade Openness Index they computed in a first

stage an index defined as the ratio of the sum of imports and exports over the G.D.P. In a second stage Low et al. (1999) corrected this basic trade openness indicator to account for differences in country size and levels of development. The idea is that large countries in terms of G.D.P. and/or population tend to trade less, as most of the trade takes place within these countries. It has been similarly argued that countries with high levels of per capita G.D.P. may be biased towards having a lower level of trade to G.D.P. ratio, because as countries develop, the share in G.D.P. of the services, which are largely non-tradable, increases. Therefore, to account for differences in country size and development levels, Low et al. (1999) run a regression in a panel of 2540 observations, where the dependent variable is the logarithm of the basic trade openness indicator while the exogenous variables are respectively the logarithms of the G.D.P., of the square of the G.D.P., of population size and of the square of the per capita G.D.P. On the basis of such a regression the author derived for each country and year the expected value of the trade openness indicator. Then in a final stage they constructed what they called the corrected trade openness index which is defined as the ratio of the actual over the expected trade openness indicator.

The corrected investment openness index was estimated in a similar way. Low et al. (1999) started by computing a basic investment openness indicator defined as being equal to the ratio of international investment flows over G.D.P.. These investment flows are equal to the sum of inward and outward Foreign Direct Investment and inward and outward Portfolio Investment Abroad. Then again they run a regression to control for the size of the country and the level of its development to finally compute a corrected investment openness index defined as the ratio of the actual over the expected investment openness indicators.

The raw data on per capita G.D.P., the Gini Indices, the indices of Trade and Investment Openness are presented in Table 1. One may observe that the richest country for which data were available is the United States (per capita G.D.P. of 18,339 dollars at 1985 prices) while the poorest country was Sri Lanka (per capita G.D.P. of 1,959 dollars). Mexico is the country with the highest overall Gini Index (0.425) while Germany is that with lowest (0.1275). Inequality between urban and rural areas is generally not very high, Mexico being the only country in our sample where the index is above 0.1.

If we now take a look at the openness indices we observe that Netherlands is the country with the highest level of trade openness (2.11), this index being also high for Ireland and Germany. On the contrary trade openness is lowest in the United States (0.43), Mexico (0.53) and Costa-Rica (0.57). Finally the international investment openness index is highest for Ireland (2.91) and the Netherlands (2.87) and lowest for Poland (0.05) and Italy (0.35).

Table 2 gives information on the population and income shares of urban and rural areas as well as on the Gini index in each area, for each country. It appears the share of rural areas in total population is high in countries like Sri Lanka (80%), Costa Rica (49%) or Turkey (42%). If we now take a look at the Gini index in urban and rural areas, we may observe that in urban areas the Gini index is highest in the United States and Mexico (.40) and in Turkey (.38) and lowest in Denmark (.17). In rural areas Ireland (.41), the United States (.41) and Turkey (.39) show the highest values of the Gini index while Denmark (0.17) has again the lowest value of the Gini index.

In Table 3 we present for the different countries included in the sample the value of the various components of the decomposition of the overall Gini index. It appears that the main contribution comes from the within areas inequality, the latter being

highest for the United States (.32) and lowest for Jordan (.12). The between areas inequality is highest for Mexico (.13) and lowest for Denmark (.002) and Costa Rica (.001). Finally, the overlapping component is highest for Ireland (.14) and lowest for Denmark (0.02).

We can also analyze the importance, in relative terms, of the different components of the inequality breakdown (see, Table 4). Then it appears that the contribution of the between areas inequality is highest for Mexico (31.1%), Sri Lanka (22.5%) and Turkey (21.7%) and lowest for Costa Rica (0.4%) and Denmark (1.3%). Similarly the within areas inequality is highest for Denmark (86.1%) and lowest for Costa-Rica (50%) and Mexico (52.7%). Finally, always in relative terms, the overlapping component is highest for Costa-Rica (49.6%) and Poland (41.4%) and lowest for Denmark (12.6%).

5) The results of the empirical analysis:

Tables 5 to 7 present the results of the regression analysis. In Table 5 we present the results of regressions where the dependent variables are respectively the overall Gini index, the between and within groups inequality and the overlapping component and the exogenous variables are the per capita G.D.P., the inverse of the per capita G.D.P. and the corrected indices of trade and investment openness. In Table 6 we present the same regressions but without the exogenous variable measuring the inverse of the per capita G.D.P. as the coefficient of the latter was generally not significant.

As a whole it appears that overall inequality as measured by the Gini index decreases with the level of development (measured by the per capita G.D.P.) and the degree of trade openness but increases with the level of investment openness.

Inequality therefore decreases with the level of development, once the degree of openness to international trade and investment is kept constant. This negative net effect of the level of development is however the consequence of several influences. On one hand an increase in per capita G.D.P. decreases the between groups (urban and rural areas) inequality as well as the overlapping component. On the other hand the effect of the level of development on the within groups inequality is less clear. In Table 5 which includes a non linear term, the coefficients of both G.D.P. and (1/G.D.P.) are positive and significant. This indicates that as the per capita G.D.P. increases, the within groups inequality increases but at a decreasing rate. This explains also why in Table 6 which does not include any non linear term, the effect of the per capita G.D.P. is not significant.

A closer look at these results shows however that the net effect of the per capita G.D.P. on the within groups inequality is in fact the consequence of two opposite impacts, as shown by the results of Table 7 in the case where no non linear term is included. An increase in per capita G.D.P. increases the within urban areas inequality but decreases the within rural areas inequality.

We could summarize all these influences by saying that as a whole as the level of development increases, differences in per capita G.D.P. between urban and rural areas as well as inequality within rural areas decrease but inequality within the

urban areas increases, the latter being probably the consequence of a relative increase in high incomes in urban areas²

If we now take a look at the pure (that is for a given level of per capita G.D.P. and of international investment openness) impact of openness to trade, we observe (see Tables 5 and 6) that, *ceteris paribus*, trade decreases the between and within groups inequality but has no significant effect on the overlapping component. Concerning this net effect of trade on within areas inequality, note that this negative effect seems to be significant only in rural areas (see Table 7). To summarize we may therefore say that the main impact of openness to international trade is, other things constant, to decrease inequality between urban and rural areas and eventually also within rural areas.

Finally concerning the effect of openness to international investment we observe that this impact is positive for all the components of the decomposition of overall inequality but the overlapping component in which case the coefficient is not significant. Concerning the effect of openness to international investment on within areas inequality, we may observe (see Table 7) that here again the coefficient is significant for rural areas but only when the variable (1/GDP) is added to the regression.

If we want to shortly synthesize all these results we could say first that as the level of development of a country increases, one observes, for a given level of openness to international trade and investment, a decrease in the income gap between urban and rural areas, an increase in inequality within urban areas and a decrease in inequality within rural areas. Second, as the degree of trade openness increases, it appears that for a given level of development and investment openness, inequality between urban and rural areas as well as within rural areas decreases. Finally, as the degree of openness to international investment increases, one observes, for a given level of development and trade openness, an increase in income inequality between urban and rural areas and within rural areas.

6) Conclusions

The policy implications of these different results seem therefore to be that trade openness which was already known (see the studies mentioned in section II) to have a positive effect on development seems to have also a significant effect on inequality in so far as the greater the degree of trade openness, the smaller income inequality. Trade openness should thus be encouraged. Openness to international investment however, which has been already criticized by certain economists because of its destabilization effects on macroeconomic equilibria, might be put also into question because it increases income inequality, though the influence seems to be more on inequality within rural areas than on inequality within urban areas or between urban and rural areas. Naturally it would be good to strengthen these conclusions by extending the sample of observations but compatible data in this field are difficult to obtain. Moreover it would be interesting, again once data become available, to analyze the more specific effect of regional integration agreements.

² Otherwise it would be difficult to understand that the combined result of a decrease in between groups inequality and of no change in the within groups inequality is a decrease in the degree of overlapping.

Table 1: Basic data on various countries

Country	Per Capita GDP	Corrected Trade Openness Index	Corrected Investment Openness Index	Overall Gini Index
Canada	16272	0.87308	1.62	0.2345
Costa Rica	3800	0.5668	0.77	0.3707
Cyprus	7858	1.41099	1.13	0.2518
Denmark	12089	1.10561	0.65	0.1673
Spain	7406	0.83605	0.85	0.2258
Finland	12360	0.9645	0.99	0.2596
Greece	5857	0.78968	0.71	0.2530
Ireland	6239	1.82391	2.91	0.3994
Italy	11741	0.96833	0.35	0.1982
Jordan	2356	1.34743	0.46	0.2082
Sri Lanka	1959	0.66893	0.52	0.3578
Mexico	4996	0.52833	1.22	0.4250
The Netherlands	11468	2.10971	2.87	0.2612
Norway	14976	1.27885	1.55	0.2782
Poland	4086	0.77703	0.05	0.2524
Turkey	3598	0.91362	0.97	0.3994
United States	18339	0.42535	0.68	0.4053

Table 2 : Population Shares, Income Shares and Gini Index of Inequality in Urban and Rural Areas

Country	Gini index in urban areas	Gini index in rural areas	Income share of urban areas	Income share of rural areas	Population share of urban areas	Population share in rural areas
Canada	.2362	.2183	.8392	.1608	.8241	.1759
Costa Rica	.3699	.3716	.5084	.4916	.5098	.4902
Cyprus	.2555	.2180	.7383	.2617	.6924	.3076
Denmark	.1671	.1688	.9268	.0732	.9246	.0754
Spain	.2239	.2162	.7553	.2447	.7235	.2765
Finland	.2538	.2572	.6553	.3447	.6138	.3862
Greece	.2503	.2456	.6954	.3046	.6556	.3444
Ireland	.3912	.4064	.6716	.3284	.6305	.3695
Italy	.1976	.1990	.7324	.2676	.7270	.2730
Jordan	.2103	.1993	.6767	.3233	.6598	.3402
Sri Lanka	.3481	.3369	.2759	.7241	.1953	.8047
Mexico	.3978	.3897	.7578	.2422	.6257	.3743
The Netherlands	.2705	.2324	.6972	.3028	.7206	.2794
Norway	.2735	.2851	.8199	.1801	.7930	.2070
Poland	.2481	.2587	.6451	.3549	.6321	.3679
Turkey	.3826	.3931	.6668	.3332	.5801	.4199
United States	.4023	.4102	.8933	.1067	.8717	.1283

Table 3: Decomposition of Overall Inequality into a Between Groups, a Within Groups and an Overlapping Component

Country	Overall Gini Index	Contribution of the between urban and rural areas inequality	Contribution of the within urban and rural areas inequality	Contribution of the overlapping component
Canada	0.2345	0.0151	0.1695	0.0499
Costa Rica	0.3707	0.0014	0.1854	0.1839
Cyprus	0.2518	0.0459	0.1482	0.0577
Denmark	0.1673	0.0022	0.1441	0.0210
Spain	0.2258	0.0318	0.1370	0.0569
Finland	0.2596	0.0414	0.1363	0.0818
Greece	0.2530	0.0398	0.1399	0.0733
Ireland	0.3994	0.0411	0.2150	0.1433
Italy	0.1982	0.0054	0.1197	0.0730
Jordan	0.2082	0.0169	0.1158	0.0755
Sri Lanka	0.3578	0.0806	0.2151	0.0622
Mexico	0.4250	0.1321	0.2239	0.0690
The Netherlands	0.2612	0.0235	0.1555	0.0821
Norway	0.2782	0.0268	0.1884	0.0630
Poland	0.2524	0.0130	0.1349	0.1045
Turkey	0.3994	0.0867	0.2030	0.1097
United States	0.4053	0.0215	0.3189	0.0650

Table 4: Decomposition of Overall Inequality into a Between Groups, a Within Groups and an Overlapping Component (in percent)

Country	Overall Gini Index	Contribution of the between urban and rural areas inequality	Contribution of the within urban and rural areas inequality	Contribution of the overlapping component
Canada	100	6.4	72.3	21.3
Costa Rica	100	0.4	50.0	49.6
Cyprus	100	18.2	58.9	22.9
Denmark	100	1.3	86.1	12.6
Spain	100	14.1	60.7	25.2
Finland	100	15.9	52.5	31.5
Greece	100	15.7	55.3	29.0
Ireland	100	10.3	53.8	35.9
Italy	100	2.7	60.4	36.8
Jordan	100	8.1	55.6	36.3
Sri Lanka	100	22.5	60.1	17.4
Mexico	100	31.1	52.7	16.2
Netherlands	100	9.0	59.5	31.4
Norway	100	9.6	67.7	22.6
Poland	100	5.2	53.4	41.4
Turkey	100	21.7	50.8	27.5
United States	100	5.3	78.7	16.0

Table 5: Regression Results³ with four exogenous variables

Exogenous Variables	Dependent Variable: Overall Gini Index	Dependent Variable: Between Groups Inequality	Dependent Variable: Within Groups Inequality	Dependent Variable: Overlapping Component
Intercept	0.339 (3.6983)	0.078 (1.63)	0.118 (1.99)	0.143 (2.56)
Per Capita Gross Domestic Product	-0.000002 (-0.48)	-0.000003 (-1.12)	0.000006 (1.82)	-0.000005 (-1.74)
Trade Openness Index	-0.189 (-4.15)	-0.054 (-2.19)	-0.105 (-3.44)	-0.030 (-1030)
Investment Openness Index	0.119 (4.40)	0.033 (2.23)	0.061 (3.36)	0.025 (1.49)
(1/Per Capita Gross Domestic Product)	210.3 (1.04)	25.0 (0.23)	254.5 (1.89)	-69.2 (-0.55)

Table 6: Regression Results⁴ with three exogenous variables

Exogenous Variables	Dependent Variable: Overall Gini Index	Dependent Variable: Between Groups Inequality	Dependent Variable: Within Groups Inequality	Dependent Variable: Overlapping Component
Intercept	0.420 (9.94)	0.088 (4.00)	0.216 (7.00)	0.116 (4.50)
Per Capita Gross Domestic Product	-0.000007 (-2.367)	-0.000004 (-2.39)	0.000001 (0.43)	-0.000004 (-2.34)
Trade Openness Index	-0.191 (-4.17)	-0.054 (-2.29)	-10788 (-3.21)	-0.029 (-1.04)
Investment Openness Index	0.114 (4.27)	0.032 (2.31)	0.055 (2.81)	0.027 (1.66)

³ t-values in parentheses.⁴ t-values in parentheses.

Table 7: Regression results⁵ for the two components of the within groups inequality

Exogenous Variables	Within urban areas inequality	Within urban areas inequality	Within rural areas inequality	Within rural areas inequality
Intercept	0.143 (1.87)	0.105 (2.96)	-0.025 (-0.54)	0.112 (3.77)
Per capita G.D.P.	0.000005 (1.06)	0.000007 (2.77)	0.000001 (0.57)	-0.000007 (-2.88)
1/Per capita G.D.P.	-98.1.2 (-0.56)		352.6 (3.33)	
Corrected Trade Openness Index	-0.063 (-1.59)	-0.062 (-1.61)	-0.043 (-1.77)	-0.045 (-1.42)
Corrected Investment Openness Index	-0.033 (-1.42)	-0.036 (-1.58)	0.028 (1.95)	0.020 (1.04)

⁵ t-values in parentheses.

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