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DID PARTIAL GLOBALIZATION INCREASE INEQUALITY? DID INEQUALITY STIMULATE GLOBALIZATION BACKLASH? THE CASE OF THE LATIN AMERICAN PERIPHERY, 1950-80

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Abstract

Inequality is an important threat to the globalization of the world economy that we experience today. This contribution uses a new measure of inequality: heigth inequality. It covers not only wage recipients, but also the self-employed, the unemployed, housewifes, children, and other groups who may not be participating in a market economy, for the 1950-80 period. It turns out that within-country inequality is higher in time periods of greater openness.
We also find that inequality leads to a "globalization backlash". The closing of commodity and capital markets did always take place during – or 5-10 years after – inequality peaks.

JEL Classification: I12, I32, N33.

Keywords: inequality, globalization, anthropometrics.

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Did Partial Globalization Increase Inequality? Did Inequality Stimulate Globalization Backlash? The case of the Latin American Periphery, 1950-80

1. Introduction

To understand the relationship between globalization and inequality is one of today's major economic agendas. Is it possible that the current globalization fails, as the previous tendency toward globalization between 1850-1914 did, because inequality stimulates anti-integration forces? Timmer and Williamson (1998) found that during the 19th century, inequality in New World countries such as the USA, Brazil, Argentina, Canada and Australia provoked anti-immigration policies that led to the disintegration of Atlantic labor markets. Rising inequality could as well decrease the legitimation of international integration, so that those groups which normally benefit from it (for example, the well-educated in medium and rich countries, and the world inhabitants on average) might not defend it with enough vigor, after having seen television reports about children in Pakistan sewing soccer balls late in the night.

There are other reasons why the study of inequality determinants is important. Firstly, inequality is now often considered as a component of the standard of living (Frank 2000, Deaton 2001): Being at the bottom of the income distribution is much harder to bear if the distance to the wealthier part of the economy is large.

In addition, inequality research is important because many growth studies in the 1990s found a strong negative impact of inequality on growth (Galor and Zeira 1993, Alesina and Perotti 1994, Alesina and Rodrik 1994, Persson and Tabellini 1994, Birdsall et al. 1995, Clarke 1995, Benabou 1996, Deininger and Squire 1998). Recently, two studies have questioned the generality of this finding. Barro (2000) argued that inequality is preventing growth only in very poor countries, while medium income countries actually grew faster with more inequality according to his regression analysis. Forbes (2000) found that most of the inequality retardation effect is picked up by time invariant fixed effects, and in the short run inequality is correlated positively with

growth. Hence, we have an on-going debate that is certainly indicating the importance of inequality studies by economists.

There are numerous ways to measure and conceptualize inequality. Firstly, due to the traditional structure of economic data that tends to be mainly aggregated by national entities, we have to distinguish between-country and within-country inequality. In this study, we will consider only the inequality within countries. Lindert and Williamson (2001) have convincingly argued that between-country inequality is not increased by globalization, if only the participants of globalization are considered. In addition, Boltho and Toniolo (1999) and Schultz (1998) found that between-country inequality did not increase at all in the post-war period, it actually declined in the 1980s and 1990s (this might be sensitive to different weighting procedures, as converging China and India have large weights). In contrast, household income inequality within 20 of 21 OECD countries was rising (Lindert and Williamson 2001, Burniaux et al. 1998). The development of inequality within Less Developed Countries (LDCs) is, however, still unclear because available data are problematic.

How can we measure inequality in LDCs? Most studies so far have concentrated on wage inequality between industries, or they estimated overall income and wealth inequality for single years. Wage inequality is clearly problematic, as so many inhabitants of LDCs do not receive wages: There are self-employed, for example, all the numerous peasants of Latin America. In addition, many people receive their income in the shadow economy, and many potential wage recipients are unemployed (or both). In addition, the amount of transfer between wage recipient and the rest of his or her household is also far from constant. In addition, wage data often refers only the large cities, whereas regional inequality is one of the major contributors to overall inequality. All these reasons, but especially the measurement problem of unemployment and self-employment with traditional wage inequality measures, suggest that the inequality of heights is a good complement to conventional indicators,

and perhaps even better in some ways.[1] In addition, Deaton (2001) and Pradhan, Sahn and Younger (2001) argued convincingly that measures of health inequality are important by itself, not only in relation to income.

While the stature variable has its specific problems[2], heights do measure important biological aspects of the standard of living.[3] Using this indicator, we are able to include the unemployed, the self-employed, the participants of shadow economies, house-wifes, children, and of course the wage recipients, too. In this study, however, our sample is restricted to mothers. We will consider below how this restriction might effect our analysis. We do not claim that height inequality should be the only measure. We would rather argue that in order to answer important questions we have to resort to a multitude of different measures and see the extent to which they correlate with one another.

One additional advantage of height inequality is its availability. In a database designed to consider the health of children and demographic characteristics of the whole population in the late 1980s to early 2000s, the firm Macro International has collected an enormous amount of information on the education, anthropometrics, and demography of women born between 1950 and 1980.[4] The data continues until about 1985, but women younger than 20 are no longer included, as the probability of selectivity bias decrease with age in this group. We also exclude extreme heights (below 125 cm or above 180 cm). Extreme heights account for 0.21% of the original sample of 71163 women, so we are not losing many observations here.

Height equality could be measured in principle by standard deviations, coefficients of variation, or centimeter distances between main occupational and income groups. I have studied the different measures of equality for early 19th century Bavaria, as the ideal data set was available for this region and time period (Baten 1999, 2000a): nearly

[1] Komlos (1985) was arguing on very similar grounds for the usefulness of stature as an indicator of the standard of living.

[2] For example, heights are especially sensitive to milk consumption. And while this might translate into a higher probability of living a long and healthy life, there are also counter-examples.

[3] For collections of recent examples, see Komlos and Baten (1998), Steckel and Floud (1997), and Komlos and Cuff (1998).

[4] The Demographic and Health Survery project (DHS) is funded by the U.S. Agency for International Development. The data set can accessed under www.measuredhs.com after applying for permission.

the whole male population was measured at a homogeneous age and the economic status of all parents was recorded. This allowed a comparison of the different measures that turned out to be highly correlated. The standard deviation was not a good measure, as anthropologists argued that it increases with average height. The coefficient of variation (CV), in contrast, is a robust estimator of inequality, if certain conditions of homogeneity are fulfilled (especially: no mixture of still growing and adult individuals). Nevertheless, the very high correlation between CV and the standard deviation (if average height is not too unsimilar) makes a comparison with the more intuitive standard deviation possible.

Recently, World Bank and development economists have suggested the Theil entropy measure of height as an inequality indicator (Pradhan, Sahn, and Younger 2001). If the CV of height (as suggested by Baten 1999, 2000) is calculated for their data, both measures are highly correlated (a regression R-square of 0.99), so the CV can easily be converted into the Theil measure.[5]

2 Data

2.2 Potential selectivity and geographical coverage

The company Macro International Inc. performs surveys of child health and health-related behaviour in order to create a solid and representative database for improving child health (among other aims). They recorded heights of several 100,000s of women (mothers) in many developing countries that were mostly born between 1950 and 1980. As adult height is mostly determined around birth, the height of the mother can shed light on the development of nutritional status in this period.

Does this data set of mothers tell us something about all women, and about the population in general? Moradi (2002) has explored the potential difference between

[5] Using their data in table 2 and 3, the regression of CV of height on the Theil entropy measure and Their square yields:
CV = 4.096 + 1.652 * Theil – 0.110 * Theil-squared. All significant at 1%-level of significance. Adjusted R-square is 0.999. N=55 (South Africa is excluded, as there might be a typing error. Including it lets the R-square decrease to a modest 0.96, but the coefficients remain robust.)

mothers and non-mothers. He finds a very moderate selectivity among young mothers: Mothers at age 20-25 were slightly less educated than the reference population. By employing usual height elasticities for education levels, Moradi estimates about 1 mm shorter height of mothers, compared with the reference population of all women ages 20-25. Among older women, there was no significant selectivity. This result suggests that selectivity might not be a great problem, but further studies that investigate this potential bias for other countries would be welcome. However, data sets are scarce and if they are available, women are often recorded in hospitals (with typically stronger selection bias than in this case). Our consideration of height inequality is probably unaffected by this very small height level selectivity of 2 mm, because we are considering coefficients of variation that do not correlate with height levels.

The geographical coverage of the Latin American periphery is comprehensive. Macro International provides sufficient data on heights on seven countries that are indicated by darker shading in figure 1. „Periphery“ means low income and insufficient access to best-practice technology of the economic core. The countries Brazil, Peru, Colombia, Bolivia, Dominican Republic, Nicaragua and Guatemala represent a high share of this periphery, whereas temperate zone and higher-income countries such as Argentina, Chile, Uruguay, Venezuela and Paraguay are not in the Macro International sample.

The number of cases per country is not correlated with size. Peru is particularly well-documented, allowing a more detailed analysis below, whereas we have fewer measurements on Brazil, a very large country (Table 1).

Figure 1: Countries of our study (dark/blue: included)

Source: see table 1.

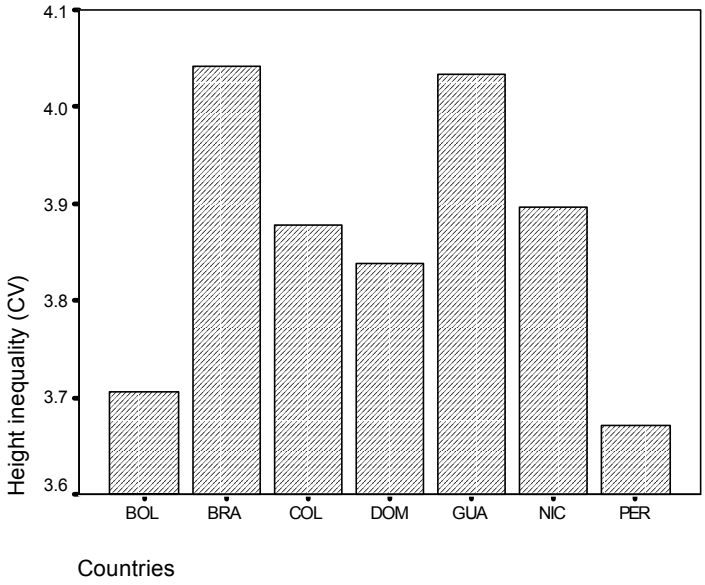
Table 1: Underlying number of cases

Years	BOL	BRA	COL	DOM	GUA	NIC	PER
1950-54	428	145	271	313	638	144	861
1955-59	1181	432	678	778	1562	399	2211
1960-64	1919	787	1412	1522	2399	760	3978
1965-69	2539	1261	2296	2456	3081	1182	5434
1970-74	2531	1314	2594	1832	3785	1410	6250
1975-79	1040	420	1424	478	1530	1113	4222

Source: Calculated from the Demographic and Health Surveys performed by Macro International Inc.

What country differences of height inequality do we observe? The CVs of Brazil and Guatemala are relatively high, whereas the average inequality in Peru and Bolivia was relatively low (Figure 2). In the Brazilian case, regional inequality could play a certain role, which we will control below with fixed effects regression models.

Figure 2: Height inequality 1950-80 (pooled)



Source: see table 1.

2.3 Do the height differences plausibly reflect the biological standard of living?

Komlos (1989, p. 183) was the first to forge the term "biological standard of living" in his study on Habsburg heights. In Baten/Wagner (2002), biological standard of living is defined by its components life expectancy, morbidity and quality of nutrition. One possibility to counter-check the validity of our Latin American height data set is to compare it with life expectancy, although one should keep in mind that each component has its idiosyncratic part. If different components of living standard are correlated, the probability of mismeasurement is lower.

How can we assess the correlation between different components of the standard of living? In the following, we compare female height levels with life expectancy of both sexes to find out whether female height is a good predictor for the biological standard of living of both males and females in Latin America (Table 2).[6]

[6] Haines (1998) compared the development of height and life expectancy in the 19th century U.S., for example. Murray (1997) is a very important methodological contribution in this field, and Fogel (1994) and Steckel (1995) summarize.

Table 2: Regressions of life expectancy on height in Latin America 1950-54, 1975-79

	Latin America 1950-54	Latin America 1975-79	OECD sample 1950
Constant (life expectancy with high stature)	71.6 (0.00)	77.7 (0.00)	73.3 (0.00)
Missing height (deviation from „high“ value*)	-1.1 (0.05)	-1.0 (0.09)	-1.2 (0.00)
R-squares	0.56	0.47	0.83
N	7	7	17

* 170 cm for female heights (Latin America) and 180 cm for male heights (“OECD” international sample that consists of Spain, Italy, Austria, Bavaria, Württemberg, Netherlands, Belgium, Germany [total], France, England, Switzerland, Denmark, Sweden, Norway, Schleswig, United States, Australia), Source: see table 1, World Bank (1999) and Baten/Komlos (1998, p. 868-9). p-values in parentheses.

We calculate the explanatory variable as the height deviation from a “high” value (in the spirit of the Human Development Index upper bounds), because this allows a direct interpretation of the constant. Young Dutch males are the tallest national population in the world; they were about 180 cm in the 1990s, and the study by Baten and Komlos (1998) took this value as a “high” value.[7] The constant explains how long people would have lived at this level of height, given medical technology, public health and all the other determinants of life expectancy.[8] We define the constant in the regression of life expectancy on female height (column 1 and 2) as the approximate height of young Dutch females today, that is close to 170 cm. At this “high” level of height, Latin Americans would have lived 71.6 years in the early 1950s, and 77.7 years in the late 1970s (Table 2, column 1 and 2). Interestingly, this constant is not too far from a constant that can be estimated using a sample of OECD countries and regions (column 3).[9] It is remarkable how similar the estimate of the constant for the 1950s is in both the Latin American and the OECD sample.

These regressions of Latin American life expectancies suffer from severe “micronumerosity” (that is, small number of cases) as there are only seven countries in

[7] Drukker/Tassenaar (1997).
[8] In the Baten and Komlos 1998 study on “OECD” countries and regions, the constant rose from 63 years around 1860 to 67.9 years in 1900 to 73.3 years in 1950.
[9] Baten/Komlos 1998.

our two cross-sections. However, in spite of the small number of cases, all coefficients are significant at least at the 10% level, and R-squares suggest that all countries are close to their regression line (Table 2). In addition, the results are plausible: In the early 1950s, a centimeter of height deviation from the female high value of 170 cm meant 1.1 year less life expectancy, in the late 1970s it diminished modestly to 1.0 years less. The coefficient of the OECD estimate is very similar with a 1.2 years loss for each centimeter below 170 cm.[10]

Summing up, a comparison of two components of the biological standard of living suggests that they are closely related. This indicates a high validity of the data. If we consider the hypothesis that height reflects nutritional status and nutrition is one of the main determinants of life expectancy, we find very plausible coefficients, even if this exercise has to rely on a very small number of cases. Moreover, the results are consistent with other studies on this relationship for OECD countries.

3 Explanatory variables: Openness and other potential determinants of inequality

3.1 Openness

Why should openness matter for inequality?

Most research in this field has been on OECD countries, arguing that imports of goods that are mainly produced with unskilled labor could decrease the demand for unskilled labor within the rich OECD countries, depressing unskilled wages and increasing inequality. However, factor endowments and relative scarcities in LDCs fundamentally differ. Wood (1994, 1997, 1998) and some others have studied the impact of openness on inequality in less developed countries. Robinson (2001) argues that globalization is mostly innocent of driving inequality in Latin America, but his

[10] It is possible that the similarity between Latin American and OECD countries in the height–life expectancy relationship (albeit there is no similarity of height and mortality levels, of course) should not be generalized to other developing regions of the world. Klasen (1994) found that in Latin America mortality-determining discrimination against women is relatively modest by LDC standards, whereas Asia for example has much stronger excess female mortality.

income inequality data does in general not start before 1970.[11] Instead, he puts most of the blame on hostile elites.

The expectation based on economic theory (in the absence of unusual complementarities between factor inputs) is the other way round: poor countries increase their exports of unskilled-labor intensive products, because their abundant factor and their comparative advantage is likely to be in this segment. Increasing production with unskilled labor should increase unskilled labor demand and wages. Therefore, the expectation is that inequality would be falling in LDC's upon engaging in international trade.

Alas, the empirics do not confirm this theoretical expectation for Latin America. After opening up their countries to imports in the 1980s and early 1990s, wage gaps increased rather than decreased as expected. In contrast, three East Asian Tigers in the 1960s and early 1970s did conform better to economic theory: Their wage gaps did decline. Wood hypothesized that the reason for this might be because at the time the Asian Tigers entered the international market they had only modest competition in the market for goods with a high content of unskilled labor. However, in the 1980s the Chinese giant did integrate into the world market, and many others followed. The Latin American unskilled workers were unlucky, because by continental Asian standards, their wage was already impressively high. This story is plausible, but has to be confirmed by supplementary evidence. After all, Wood and others did not consider comprehensive inequality data for Latin America before the 1980s. In East Asia, too, wage gaps are insufficient evidence, because large parts of the economy did not earn wages. We will augment the existing literature on this important line of research with new data as follows.

Studies on the influence of globalization and deglobalization on within-country inequality have been performed on the long-run trends worldwide. Lindert and

[11] For the countries considered here, there is one number on income inequality dated before 1970. There is more information on income inequality in the richer Latin American countries (Mexiko, Chile, Argentina), and on land inequality.

Williamson (2001) considered the data of Bourguignon and Morrison (2000) who found a strong decline of within-country inequality during the deglobalisation phase of 1914-45, whereas within-country inequality rises during the globalisation phases. They explain in detail that the theoretical expectation of land-rich New World countries does fit this observation (because immigration was much lower in the closed world economy of the war and inter-war period, and trade and capital flow restrictions might have benefited the New World poor on the expense of labor abundant Old World countries' workers). However, inequality declined in the European industrial core as well, a fact that cannot be explained with simple Stolper-Samuelson trade theory. Inflation, policy (socialism, and the welfare state), increasing taxation of the rich and more education for the poor, more limited possibilities for entrepreneurial people and more protection for workers, employees and less entrepreneurial people – all these factors are potential candidates to explain this surprising result. We will not finally explain this in our study, but this result might follow the same mechanism as our results for Latin America here.

How can we measure "openness"?

Given the importance of this variable, much work has been done in this field. Most economists agree that simple trade shares of GDP are insufficient by themselves to capture the degree of openness of an economy. If two neighbouring free-trade countries have exactly the same factor endowment, it is possible that their trade is relatively low in spite of their openness, simply because production is so similar. On the other hand, two highly protected countries can experience high trade shares, if their endowments are sufficiently different. Many alternative measures for "openness" have been proposed. We will consider two of them that are somewhat extreme cases among the many different measures, and see if both have the same effect on our inequality variable whose variation we want to explain.

World Bank economists, under the lead of Greenaway, have created a four category system of “strongly” or “moderately outward oriented countries”, and “moderately ” or “strongly inward oriented countries”, and they applied this to 41 developing countries. The criteria to classify countries into these groups are the following: direct trade controls (quota, import licences), effective rates of protection, export incentives, and exchange rate overvaluation (World Bank 1987). The idea behind the latter variable was that inward orientation often led to an overvaluation of the exchange rate. Among our seven Latin American countries, none reached the highest level of outward orientation (of the 41 LDCs, only Hong Kong, South Korea and Singapore reached this category). We coded our countries in the remaining three groups with an integer index of 1 to 3.

Another, more recent attempt was the openness index of Sachs and Warner (1995) for 79 countries. These authors also consider high tariffs, important tariff barriers, plus state monopolies of major commodity exports, a high black market premium for national currencies, and socialist economic system. This variable is coded as a binary variable. Rodriguez and Rodrik (1999) critized that especially the state monopoly and currency black market premium might measure other economic characteristics than just lacking openness. The currency value distortion also indicates other macroeconomic problems. However, if there is no perfect measure of openness it is a promising strategy to use both and see if the results are consistent. For the Latin American case both indices are not significantly correlated, because some countries’ openness is jugded in a different way (Table 3): There is some disagreement between World Bank and Sachs/Warner about Brazil: The World Bank regards this country as moderately outward oriented, SW as closed (until 1991). There is broad consensus about Dominican Republic, Nicaragua and Peru, WB is more optimistic about Colombia’s and Guatemala’s 1960s. SW are more optimistic about Bolivia in the 1960s.

Table 3: Opening and Closing according to Sachs/Warner and World Bank

Country	Opening	Closing
Bolivia	SW1956 SW1986	SW1979 WB1973ff
Brazil	SW1991	
Colombia	SW1986	WB1973ff
Dominican Republic	SWNever	
Guatemala	SW1989	SW1962 WB1973ff
Nicaragua		SW1961
Peru	SW1992	SW1968

WB: No changes 1963-85: Nicaragua remains moderately inward oriented, Brazil remains moderately outward oriented, Dom. Rep. remains strongly inward oriented. Sources: Sachs/Warner (1995), World Bank (1987).

3.2 Other explanatory variables

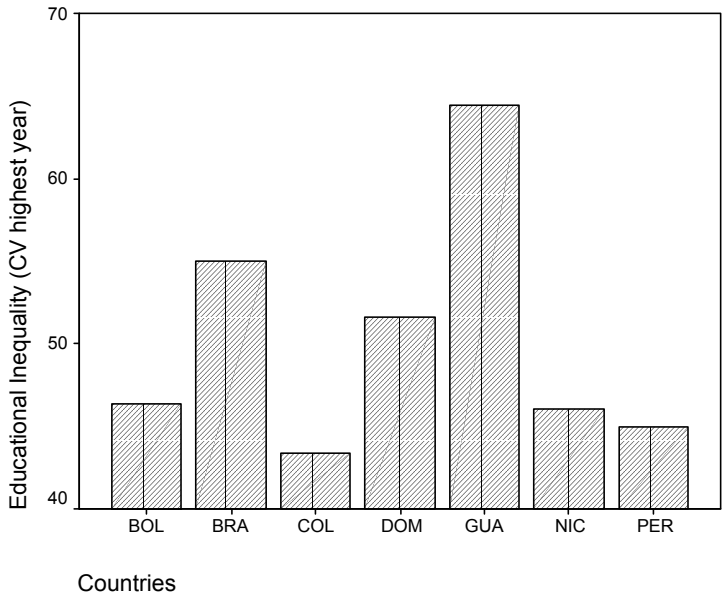
Inequality of education

Human capital endowment is a very likely candidate that could influence inequality. Moreover, it might be a proxy for endowment inequalities that we are not able to measure (such as wealth inequality or inequality of entrepreneurial ability), but this assumption has to await further, more detailed research.

We measure educational inequality with the coefficient of variation of the highest year of schooling that the women in our sample received (Figure 3). In order to minimize measurement error with regard to timing, we lagged this variable so that we consider educational inequality for the period when women likely received most of their schooling (on average 3.5 years) between age 6 and 10. Some women might have gone to school later, but most of schooling was probably received at this age. Variation of the lag specification did not change the results.[12]

[12] Guatemala has very high values of educational inequality, followed by Brazil and the Dominican Republic (Figure 3). Using the coefficient of variation here could be debatable as well, because it has higher values if the average of "years of schooling" is low. However, we think that having 1 year less than the average schooling weighs more, if the average is only 3 years, than if the average is 5 years.

Figure 3: Educational inequality by country



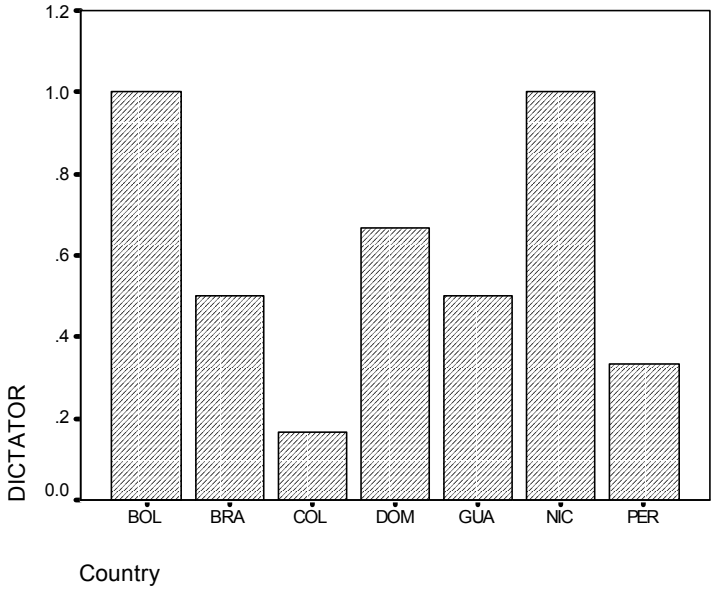
Source: see table 1.

Dictatorship

The reseach project "POLITY IV", at the University of Maryland, has created comprehensive surveys on the democratic or autocratic behaviour of governments in recent history. One could imagine that dictatorship might increase inequality, as most Latin American dictators were right-wing, who might have taken political steps to redistribute income in favor of the rich. They also typically suppressed unions who strove for flatter pay schemes. However, there were exceptions, such as the Peruvian dictators after 1965. But the results do not change if we differentiate between different political orientations of dictatorship.[13] Empirically, Colombian government did get the best grades during this period, while Nicaragua and Bolivia were particularly non-democratic (Figure 4).

[13] See www.uni-tuebingen.de/uni/wwl/regr_lag.pdf, regression 3 and 4.

Figure 4: Dictatorship

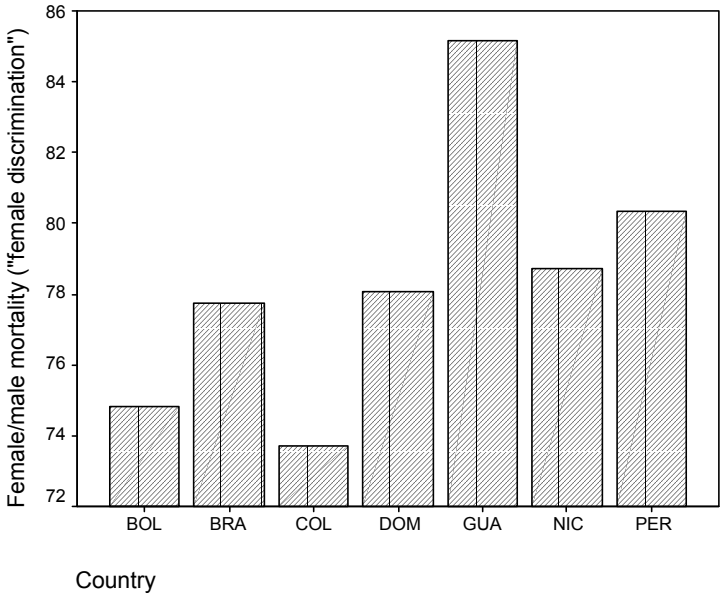


Source: Polity IV project, Univ. Maryland.

Gender inequality: female excess mortality

Our data set relates to women, and although we found a relatively close relationship with life expectancy of both sexes above, a control variable for gender discrimation might strengthen the validity of our regressions. We constructed a rough indicator of excess female mortality by dividing female mortality by male mortality (multiplied by 100, see Figure 5). As there is a biological survival advantage for women, a value close to 100 would suggest that less nutritional and medical resources were provided to females. Better measures that take account changing age structures could improve the results here.

Figure 5: A Proxy for Female Excess Mortality: relative mortality by country



Source: World Bank (1999).

4. Did Openness correlate with higher inequality?

In four regressions of inequality, we employed the two different concepts of openness plus different sets of other factors as explanatory variables (Table 4). The first two regression columns employ the World Bank concept of openness, and the two regressions on the right use the Sachs/Warner concept. Regressions 1 and 3 are least square dummy variable models that account for country fixed effects. The advantage of this method is that a certain control for unobservable, country specific factors is given that varies little over time.

Table 4: Determinants of inequality in the Latin American periphery, 1950-80

Dependent variable: height inequality (coefficient of variation of height)

Which concept of openness?	World Bank	World Bank	Sachs/ Warner	Sachs/ Warner
Openness	0.22 (0.04)	0.14 (0.00)	0.29 (0.01)	-0.04 (0.65)
Ineq education * 100	-0.12 (0.88)	0.77 (0.00)	-1.36 (0.16)	1.13 (0.04)
Dictator * 100	3.79 (0.64)		3.72 (0.63)	3.49 (0.60)
Fem./male mor-tality * 100	0.80 (0.45)		0.68 (0.51)	0.14 (0.88)
Trend		0.00 (0.52)		
Constant	2.81 (0.00)	-1.07 (0.87)	3.57 (0.00)	3.19 (0.00)
Fixed Effects included?	YES	NO	YES	NO
Adj. R-sq.	0.32	0.36	0.38	0.10
N	42	42	42	42

N=42; Constant refers to omitted country in fixed effects models; p-values in parentheses. Sources: See table 1 and text.

We find a relatively consistent positive influence of openness on inequality.[14] Only in specification 4, is there no influence of openness. This is caused by the fact that Sachs and Warner classified Brazil as an always “closed” economy (and it had a high CV of heights). However, if country fixed effects are controlled for (col . 3), the openness variable regains significance even with the Sachs/Warner classification. The coefficients of openness are very robust.[15] Are these coefficients large or small? A representative “high inequality observation” has a CV of 4.10, a “low inequality observation" has 3.66.[16] Therefore, the difference between open and closed economies

[14] Moreover, in dozens of other regression specifications this variable turned out to be very robust.
[15] Even if we should take into account that the World Bank concept is coded as integers between 1 and 3, whereas the SW concept is coded as a dummy variable. We could adjust the WB coefficients to take account of that, but still the coefficients are in the same magnitude.
[16] "Representative" high and low: Those are one standard deviation above and one standard deviation below the mean. Note that we are dealing here with standard deviations of coefficients of variation of height.

(0.29) in the SW specification accounts for more than two-thirds of the difference between high and low (0.44). Therefore: yes, this influence is large and economically meaningful.

The educational inequality can explain some of the height inequality measure, if we assume that there are no unobservable country-specific variables that we cannot measure (col. 2 and 4). However, if we include country fixed effects, this variable becomes insignificant. There might be an influence, but we cannot be sure.

The other variables have no statistically significant coefficients. The signs of the coefficients are as expected (higher inequality under dictatorship and female excess mortality regimes) and relatively robust, but the lack of significance indicates that there is at least a large amount of variation around these observations. This can be caused by measurement problems, but more likely the influence is unsystematic. The trend tested in regression 2 is insignificant, indicating that either Kuznets' inverse U theory does not hold for this GDP growth period or that the top of the inverse U is reached within those three decades (first up, then downward trend).

The country fixed effects (not shown in detail) resemble the averages in figure 2. Especially Brazil and Guatemala had a much higher height inequality than Peru or Bolivia. Brazil is so much larger than all the other countries, therefore the influence of regional inequality could be quite large. But why Guatemala?[17] Could this be caused by a very high share of American Indian origin of the population? This seems unlikely, because Peru has also a high share. In addition, under favourable conditions Guatemalans of Indian origin rapidly converged in height to US standards, as Bogin (1991) demonstrated.

The explanatory power of these models is relatively large, even without country dummies almost 40% of inequality variation can be explained. The Sachs and Warner concept of openness leads with controls for fixed effects to higher explanatory power.

[17] The long civil war could not be the reason, because Guatamala had already high inequality before it started.

To sum up this section, we find a consistent positive influence of openness on inequality. We cannot be certain whether educational inequality had an increasing effect, because significance vanishes in the fixed effects model. Our control for female discrimination did not have an observable influence.

5. Did inequality increase the propensity of globalization backlash behaviour?

5.1 Results of other studies

We have considered the differences of inequality levels and found that more autarkic periods tend to be associated with less inequality. However, we did not make final judgements about causality. Especially the direction of causality is an important topic for economic policy: Does inequality drive anti-globalization behaviour, because the relatively impoverishing groups want to shut the doors for foreign products, or does globalization increase inequality by increasing competition and shifting factor demands? Or both? If the inequality-causes-globalization-backlash idea would be the driving forces, we would expect that during or shortly after (5-10 years) inequality peaks a shift to inward-looking development would take place.

Because the exact lag structure of this alternative direction of causality between inequality and openness is less clear, our sample size does not allow sophisticated econometric tests (such as Panel Granger causality tests etc.), but a glance at descriptive statistics and findings for comparable economic histories can yield important insights. The economic history of anti-immigration behaviour in the New World countries between 1860 and 1930 is particularly interesting in this context, and well-researched. The ratio of migration to population reached unprecedented levels in countries such as the U.S., Argentina, Brazil, Canada and Australia before WWI. Timmer and Williamson created an index of migration policies and considered the potential determinants of anti-migration behaviour of New World political decision-makers (assuming that those did follow their voter's interest). Variables such as education of migrants (measured as the relative wage in the country of origin) and

policy inertia (or, I would rather call it stability) also played a role, but the crucial variable here was inequality that had a strong and consistent influence on anti-migration behaviour. In short: inequality stimulated anti-globalization behaviour (in this case in labor market policies). Is this relationship observable for the post-war Latin American commodity and capital market as well?

5.2 Did inequality drive globalization backlash in our study?

In Latin America after WWII anti-globalization behaviour on the labour market (anti-migration policies) did not play a large role, because the direction had turned to emigration. Now, commodity and capital markets were central issues in the political debate. The dominance of one single investor country and trading partner increased fears in Latin America that the U.S. would exploit monopoly profits and use political and secret service activities to redirect economic income streams in their favour. Stories of individual companies were taken as *pars pro toto* suggesting a problematic role of foreign capital (such as ITT that spent considerable sums of money to destabilize the far left-wing Allende government in Chile to make the communication investment more profitable). While this particular history is certainly not representative for other companies (if it not just a rumour at all), the psychological influence of such stories should not be under-estimated.

Did inequality of heights have a similar effect on the propensity to reduce international economic integration? One possibility to answer this question is to consider the peak of inequality in each country and to consider whether in the following decade there were moves towards inward-looking economic policy or not.

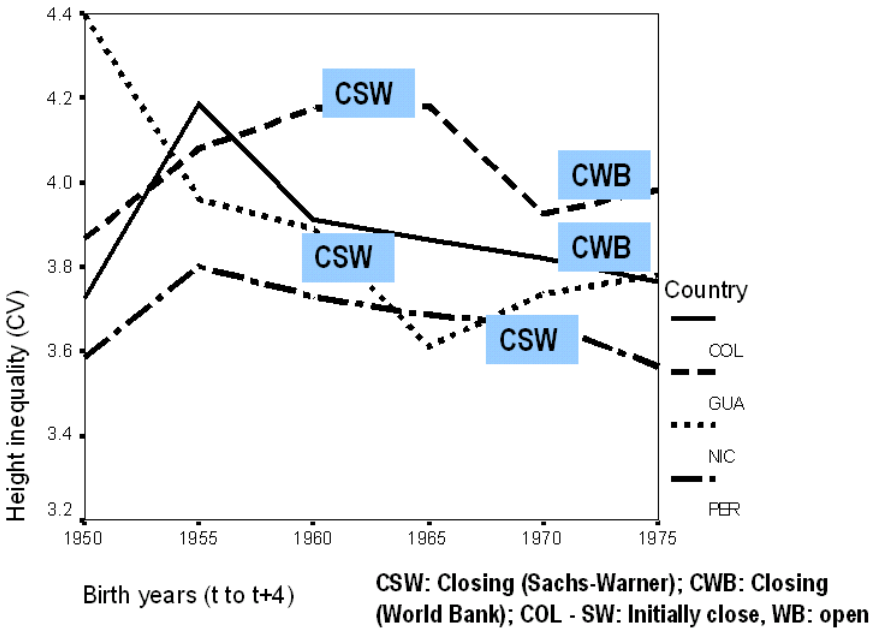
Peak inequality was followed by a closing of national markets in the following decade in Bolivia, Colombia, Guatemala, Nicaragua and Peru (Table 5, Figure 6a and 6b). In the case of Colombia the closing would be later than expected after the inequality peak in the early 1960s. The Dominican Republic and Brazil could not close, because they were never open (Brazil according to Sachs and Warner).

Table 5: Peak inequality and Closing of Latin American Countries

Country	Peak inequality (two 5-year-periods)	Closing after ... years?
Colombia	1955-64	yes, after 10-15 years
Guatemala	1960-69	yes, simultaneously and after 5-10 years
Nicaragua	1950-59	yes, after 5-10 years
Peru	1955-64	yes, after 0-5 years
Bolivia	1960-69	yes, after 5-10 years
Brazil	1955/59 & 1970-74	n.a.: never open!
Dom. Rep.	1955/59 & 1965-69	n.a.: never open!

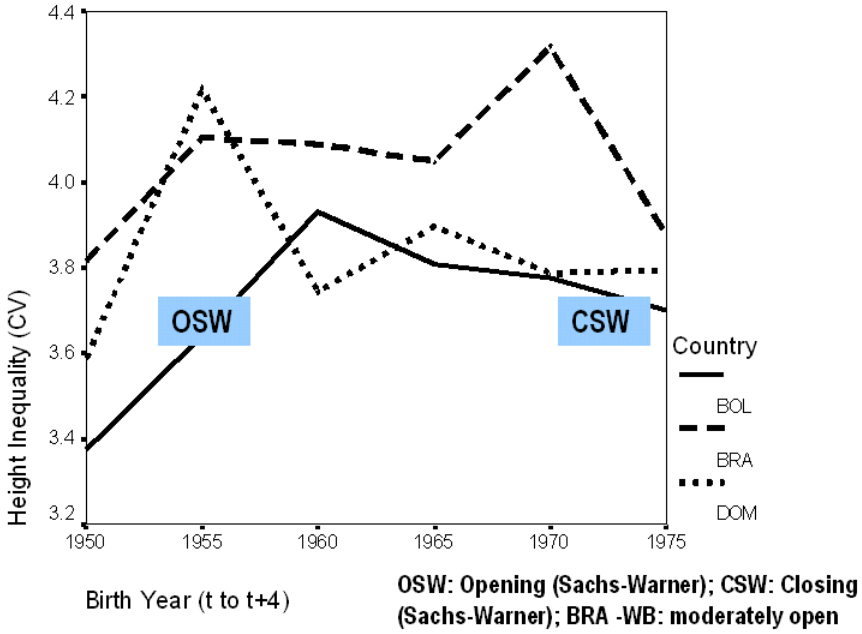
Sources: Sachs/Warner (1995), World Bank (1987).

Figure 6a: Height inequality trends and Opening (OSW) or Closing (CSW, CWB) of the countries: Initially Open Countries



Source: see table 1 and Sachs/Warner (1995), World Bank (1987)

Figure 6b: Height inequality trends and Opening (OSW) or Closing (CSW, CWB) of the countries: Initially Closed Countries



Source: see table 1 and Sachs/Warner (1995), World Bank (1987)

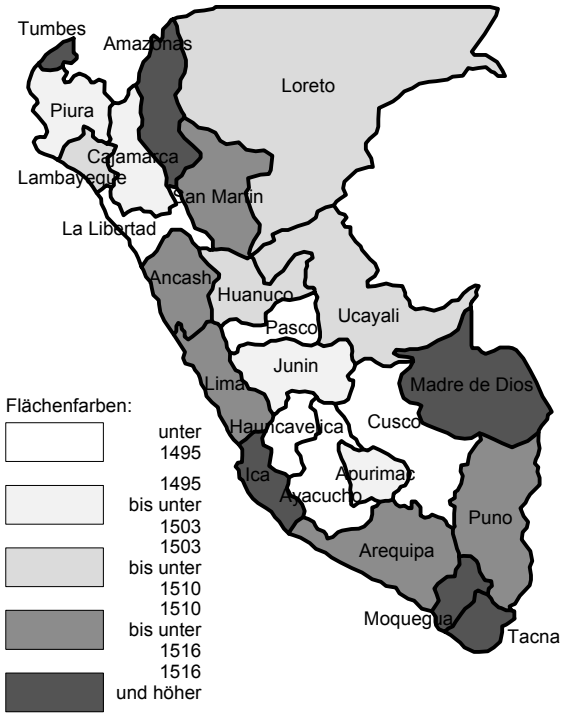
Did equality periods on the other hand stimulate openness? It is interesting that there was never an opening after a peak inequality period. The only opening that did occur was Bolivia's opening in the late 1950s, after a period of peak equality (1950-54). In addition, after many of our countries experienced several years of equality trends, there was an movement towards openness in the 1980s and early 1990s. Brazil that did have his inequality peak very late (and had therefore a distinct inequality development from all the other countries), did not open before the early 1990s.

6. Did inward-looking development reduce regional inequality?

In today's China, and to a lesser extent in other countries such as Russia, regional inequality is one driving force of widening income gaps: The communists Chinese government did open up special economic areas along the coast. This partial globalization leads to strong inequality, but not because in these zones wage gaps are widening. No, the reason is that the non-participating regions in the interior do not

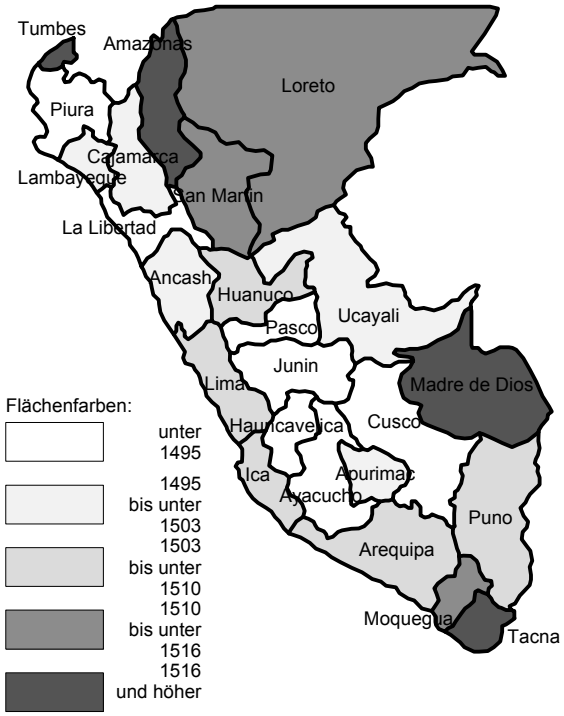
participate in this type of globalization, caused by the political decision of the government. One could imagine that the decline of inequality in our closed Latin American economies might be caused by declining regional inequality. This was not the case, at least not in Peru, our best-documented case. In Peru before 1968, the poorest regions were the central highlands, whereas the frontier Amazonas region and the coastal zones had better nutritional status (Figure 7). After the closing of the economy in 1968, the heights of the central highlands did not converge to those of the coastal zones and the Amazonas region (Figure 8 and 9). Just the opposite: The coastal zones had a favourable development, their biological standard of living was rising, whereas the poor regions (for example, Ayacucho, Hauncavelica and Apurimac) remained on a low level.

Figure 7: Average heights in Peruvian regions, 1968-80



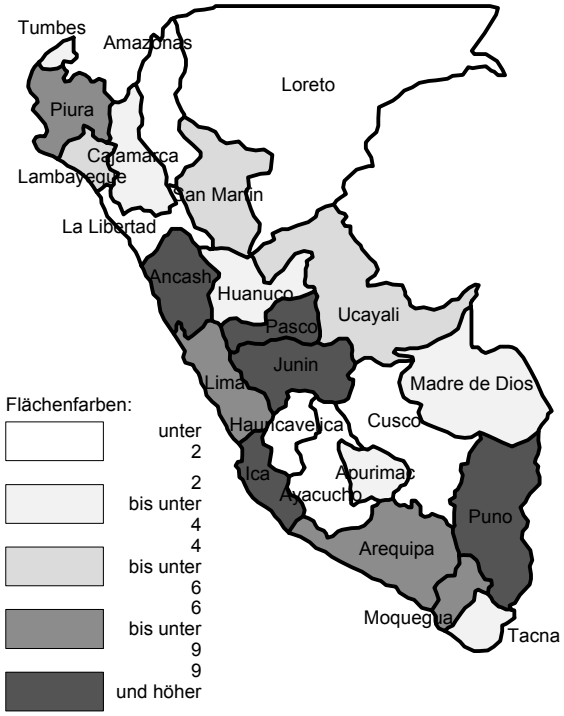
Source: see table 1.

Figure 8: Average heights in Peruvian regions, 1950-67



Source: see table 1.

Figure 9: Change in Peruvian heights, 1950-67 to 1968-80



Source: see table 1.

The inhabitants of these central mountaineous regions must have been very disappointed: A left wing dictator promised that the standard of living should dramatically rise for everybody after the yankee exploiters were chased out of the country. But what did happen? Regional inequality widened (although we cannot be sure whether a part of the developement might be caused by selective migration, but this seems unlikely).

During the late 1970s of the dictatorship period, a professor from Lima appeared in these most depressed regions and found enthusiastic support among the disappointed peasants: The maoistic Sendero Luminoso movement had its main recruitment area exactly in these regions that were situated at the bottom of the Peruvian economy, and fell even further in the relative income position.

7. Conclusion

We considered inequality to be an important threat to the globalization of the world economy that we experience today and wanted to know whether openness itself, or partial globalization forces, increase inequality. In a second step, we discussed the potential influence of inequality on anti-globalization forces.

In order to answer these questions, we proposed a new measure of inequality: height inequality. This measure covers not only wage recipients (as some other inequality indizes do), but also the self-employed, the unemployed, house-wifes, children, and other groups who may not be participating in a market economy. However, one has to assume that the inequality among women was not unsimilar to the unequality of men, if the aim is to measure the whole economy. It turned out that within-country inequality is higher in time periods of greater openness, whereas closed ecomonies have lower inequality. This result was robust under different definitions of "openness". Other potential determinants, such as educational inequality, dictatorship, female discrimination had none or limited influence on height inequality.

However, it is partial openness that we consider here. Under full economic integration, inequality will fall again. It is perfectly possible that inequality follows a modified Kuznets' Inverse U curve, in which the "explanatory" variable is not income (as in Kuznets' curve), but openness: Only very open economies on the right segment of this curve might have decreasing inequality. Perhaps the Atlantic economy between 1870-1913 was open to this degree, as Lindert and Williamson (2001) find overall decreasing inequality driven by globalization. And perhaps the OECD countries in the 1990s were also on the right segment of this curve – on average. But most of the openness we observed in world economic history during the last centuries was probably "partial" openness, i.e. on the left of the modified Kuznets curve.

Therefore, it is important to consider the hazards as well. We found that after a certain time lag, inequality leads to "globalization backlash": The closing of Latin American commodity and capital markets did always take place during, or 5-10 years after, inequality peaks. In contrast, the opening up during the 1980s and early 1990s was preceded by a longer egalitarian development.

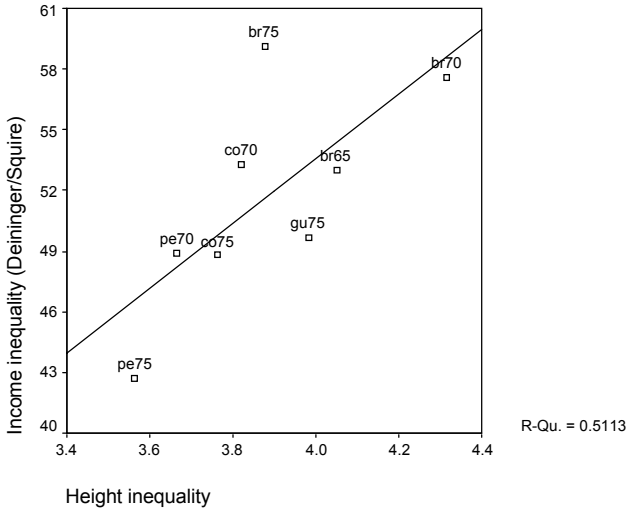
The egalitarian tendency of inward-looking development did not result in less regional inequality, however. The central highlands of Peru, for example, remained depressed within a closed economy, while the coastal regions developed better. These depressed regions became the recruitment base of one of the most violent terrorist movement, the maoistic Sendero Luminoso.

What is the policy implication of this paper? We would not argue that inward-looking development should be promoted. Taylor (1998) and many others have convincingly demonstrated the detrimental effect of inward-looking effect on average income growth. The benefits of globalization on between-country convergence (of partipants) and the average long-run increase in world living standards are larger than the costs discussed in this study. Rather, this contribution wants to measure the risks of partial globalization, that arise if the government does not provide enough tax-financed schooling to the poorer segments of the economy. We would suggest that inequality

effects have to be counter-balanced by creation of public goods, so that we will be able to enjoy an integrated and richer world economy in the 21st century.

Appendix A: Is height inequality correlated with income inequality data?

If there is potential measurement error, it is a very important task to compare different indicators for the economic variable that we are interested in. The natural comparison for height inequality is income inequality. However, the number of cases for comparison are very limited. Robinson (2001) reports all available data points of high



measurement quality in the Deininger and Squire data set for the countries here under study, mostly from the 1970s. We can reconstruct 8 data points (including data on 1980/81 on Brazil and Peru). These few points are in fact highly correlated with height inequality (Table A1). Each unit of the CV means 16 points of the Gini coefficient. The distance of 0.44 between low and high height inequality (=two standard deviations) accounts for 7 points on the Gini scale. Looking at the variation of Latin American Gini coefficients, this seems realistic (Figure B1).

Table A1: Regressions of income inequality on height inequality

Source: see table 1, Robinson (2001)

Height inequality (CV)	15.93 (0.05)
Constant	-10.18 (0.70)
R-sq	0.51
N	8

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