Another empirical look at the Kuznets curve

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Abstract

This paper examines the functional relationships between income inequality, economic factors, institutions, and Kuznets' inverted-U hypothesis. A model that incorporates interactive as well as direct effects of several factors to capture their combined effect on inequality is developed. The model is estimated using two popular measures of inequality—the Gini coefficient, and the ratio of income shares in income distribution—using a panel data set for 57 countries from 1987 to 2006. The results provide support for Kuznets' hypothesis; however, the relationship between growth and inequality is conditioned by a host of economic and institutional factors.

Keywords: Kuznets curve, inequality, growth, Gini coefficient, income shares

JEL classification: O1, O40

1. Introduction

The relationship between inequality and economic development has continued to fascinate economists ever since Nobel Laureate Simon Kuznets (1955) suggested that such a relationship may take the form of an inverted-U. This hypothesis predicts that inequality first increases in the early stages of development, reaches a maximum at an intermediate level of income, and then declines as the country achieves a high level of per capita income. As a poor country embarks on growth, the process of industrialization leads to greater inequality as a result of a shift of labor force from low-productivity agriculture to sectors of higher productivity. If inequality between agriculture and the rest of the economy was more pronounced than that within each sector, then inequality would first rise as people moved out of agriculture and then fall as many of them found themselves in the new sector, or the economy reached a point where the factor movement was equalizing returns across sectors. The Kuznets hypothesis generated a great deal of interest, much of it driven by the concern that development hurts the poor.

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Empirical estimates of the hypothesis have continued to provide different results. Given the dearth of data for estimating income distribution at the time, Kuznets based his hypothesis on data for a few countries. Early tests of the hypothesis for England, Germany and the United States seemed to support Kuznets' proposition, but in a large number of later studies, a wide variety of results emerged with some challenging the hypothesis and others supporting it. Most of these studies used cross-sectional data while a few used time-series data. These earlier studies often suffered from serious problems with the quality and availability of the underlying data.

Estimates of the distribution of income or consumption provided by a World Bank project (Deininger and Squire, 1996) seemed to provide some general support for Kuznets' hypothesis when cross-section data were examined. For instance, Jha (1996) reports that despite problems with data comparability, the Kuznets hypothesis holds. Galor and Tsiddon (1996) use a general equilibrium model based on an endogenous mechanism and find that growth is accompanied by increasing inequality in the early stages of development, and declining inequality in later stages. Using a panel data set for 96 countries, Thornton (2001) also finds empirical support for the Kuznets hypothesis. Higgins and Williamson (2002) find that inequality follows an inverted-U as an economy's aggregate labor productivity rises and that inequality falls as population matures. Similarly, Lee (2006) finds support for the hypothesis in his examination of 14 European countries covering 1951-1992. Huang et al. (2007) also verify the Kuznets prediction for countries with mild income inequality but do not find such support for countries where inequality is either too high or too low. Chen (2008) examines the growth inequality nexus in 23 cities and counties in Taiwan from 1983 to 2006 and finds the existence of the inverted-U relationship.

Quite a few empirical studies refute the Kuznets hypothesis, however. For example, Fields (1991) finds that there is no tendency for income inequality in poor countries to increase (rather than decrease) and no tendency for income inequality in rich countries to decrease (rather than increase). Similarly, Ravallion and Chen (1997) in their study of 67 developing and transitional economies covering the 1981-94 period find that income distribution improved with economic growth as often as it worsened. And as the first users of the new dataset, Deininger and Squire (1998) found no support for the Kuznets hypothesis in the cross-country data on income and asset distribution.

Lundberg and Squire (2003) claim that growth and inequality move together, determined by a simultaneous process. To examine the effects of policy, focusing on one outcome but not the other will then lead to incomplete results and to those that are less relevant to policy. Francois and Rojas-Ramagosa (2004) develop a methodology to reduce the measurement error problems in the secondary data on inequality. Davis (2007) formulates a model of a dual economy where the formal sector leads economic growth through spillovers of human capital. If institutions erect barriers on the formal activity, growth suffers and inequality worsens as well. Since institutions can be very dissimilar across countries, the growth-inequality outcomes can also be different.

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2. Theoretical background, methodology and data

The relationship between inequality and growth is a long run one and is influenced by other economic and institutional factors. Income growth has an important effect on inequality but this effect can be accentuated or mitigated by other economic factors. How inequality is influenced in the long run thus also depends on factors such as the degree of economic freedom and competition, development of the financial sector, level of education, degree of economic openness, nature of tax regime and the extent of political freedom. It should be noted that many of these factors also affect growth and are in turn facilitated, if not induced, by economic growth, social development and government policies. Further, greater availability of some of these factors implies a high level of development of the formal sector as well.

This paper takes a traditional approach in that it assumes that income growth affects inequality as postulated by Kuznets, but remains consistent with the implications of the Davis model (2007) of income and inequality. It tests the impact of income in conjunction with the above mentioned factors on inequality. So we postulate the following model for the determination of inequality within country *i* in period *t*:

$$Ineq_{it} = F(Ineq_{i,t-1}, Y_{it}, Y_{it}^{2}, FinDev_{it}, Frdm_{it}, Open_{it}, FinAcc_{it}, LMob_{it}, Tax_{it}, Polit_{it}, Edu_{it}, IP_{it}) \quad (1)$$

Where

Ineq = income inequality index (Gini concentration ratio)

Y = level of real per capita income (purchasing power parity adjusted dollars, World Development Indicators 2008)

Frdm = degree of economic freedom (competitiveness) within the country (Freedom House data)

FinDev = degree of financial development (M2/GDP ratio; International Financial Statistics Yearbook, different years)

FinAcc = degree of freedom in private sector's access to credit (Monetary Survey Credit to the Private Sector; International Financial Statistics, different years)

LMob = degree of labor mobility (proxied by sectoral or agriculture-industry wage differential; not used in estimation for lack of data)

Open = degree of international openness

Tax = degree of use of anti-inequality policy (tax progressivity as measured by the ratio of highest marginal to average income tax rates)

Edu = level of education (average years of schooling in adult population)

Polit = degree of political freedom (democracy minus autocracy, University of Maryland Polity 6)

IP = income support policy (dummy variable for publicly provided social insurance, not used in estimation for lack of data).

The subscript *i* refers to country, and *t* for time period.

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Generally, a competitive economy is expected to adjust to exogenous economic changes including those in policy relatively quickly and thereby increase the possibility of broad based economic growth. Lack of competition is likely to accentuate sectoral and regional income differences leading to an increase in overall income disparity. A high degree of competitiveness in the economy requires that resources and information be allowed to flow freely between sectors. It also allows relatively free entry and exit and makes it harder for income disparity to be sustained for a long period of time.

Therefore, for the Kuznets curve to manifest in full force, greater economic freedom in financial and labor markets as well as in the overall economy is essential. Institutional barriers in labor market participation or access to capital could result in growth being inequality inducing, while no barriers will result in economic growth that alleviates inequality. Thus, a priori, one would expect that the closer a country's economy is to a competitive market, the more likely and rapidly it would show an inverted U-relationship between income and inequality. If one were to assume market imperfection either due to factor market rigidities or monopolistic practices in product markets, one would expect inequality to decline only slowly in the absence of strong government policies to reduce it.

Our paper uses the following regression equation for country i in period t. This is based on functional relationships, as discussed above, between inequality, economic factors, institutions, and the inverted-U hypothesis.

$$\begin{aligned} Ineq_{it} = {} & b_1 + b_2 \ln Y_{it} + (b_3 + b_5 FinDev_{it} + b_6 FinAcc_{it} + b_7 LMob \\ & + b_8 Frdm_{it} + b_9 Edu_i + b_{10} Open_{it}) \ln Y_{it}^{\,2} + b_{11} Ineq_{i,t-1} + b_{12} Tax_{it} + b_{13} Open_{it} \\ & + b_{14} FinDev_{it} + b_{15} FinAcc_{it} + b_{16} LMob_{it} + b_{17} Frdm_{it} + b_{18} Edu_{it} + b_{19} IP_{it} + e_{it} \end{aligned} \quad (2)$$

Equation (2) includes interactive as well as direct effects of several factors to capture their combined effect on inequality. For example, increasing the growth of money supply could be inflationary in a way that adversely affects inequality in favor of investors relative to savers. Increased money supply to the private sector can, however, help to improve access to credit, making national investment and growth more broad based and inequality-reducing as income grows. Similarly, open trade may affect inequality differently over time as a country's income grows. For instance, trade could serve as an engine of growth and over time it may reduce income inequality. In the short to medium run, however, trade may increase inequality as the domestic market adjusts to a new specialization regime initiated by trade. It may also affect income inequality depending upon how broadly the international trade occurs. The model can thus be used to test different hypotheses about the how these terms directly and indirectly interact to affect inequality.

One would expect *a priori* that the closer a country's economy is to a competitive market, the quicker one might observe an inverted-U relationship between income and inequality. In this sense, we would expect the sign of the coefficients of $(lnY)^2$ to be negative as would their interactive terms with other competition enhancing indicators. One would also

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expect the coefficients of such terms to have a negative sign. However, given the complex nature of interactions between these variables that makes it difficult to make theoretical predictions, we argue the signs of the associated coefficients should be determined with an empirical model. It is likely that they will have significant and positive coefficients and thereby mitigate the inequality dampening effect of growth. Theoretically, this could happen if they lead to 'narrow based' economic growth or they contribute to reduce competition in the market. In short, it is possible to observe positive or negative effects of income growth on inequality depending on the net effect of these different variables.

The paper estimates the model using two popular measures of inequality: (1) The Gini coefficient, and (2) the ratio of income shares of the top 10 to the bottom 10 percentiles of population in the income distribution. Purchasing power parity adjusted value of the real GDP per capita (at constant dollars) serves as our measure of income. Following a tradition in the economic development literature, we use the money supply (M2) to GDP ratio as a proxy for the level of financial development together with domestic private credit to GDP ratio as a measure of the degree of access to capital. In addition, the paper uses trade to GDP ratio as an indicator of the degree of openness. The model implicitly assumes that a higher degree of international openness is a reflection of competitiveness. In light of transnational firms and imperfect markets, such an assumption may not always be true and becomes an empirical question. Due to lack of data, we were unable to include measures of labor mobility and other policy variables that may have an impact on the level and change in inequality.

The data used in the model were compiled from *World Development Indicators CD-ROM 2007* and *WIDER* dataset. A panel data set was constructed for 57 countries extending over 20 years from 1987 to 2006. These countries include countries from all continents and as the study requires, with different levels of income. There are 16 Asian, 6 European, 16 Latin American, 3 North American, 2 Oceania, and 14 Sub Saharan Africa countries.

3. Estimation and results

The Gini Coefficient

In the estimated form of model (2) for the Gini measure of inequality, a few variables were dropped due to lack of data. A reduced specification based on the theoretical models (1) and (2) appears in below.

$$Ineq_{it} = b_1 + b_2 \ln Y_{it} + [b_3 + b_4 FinDev_{it} + b_5 DomCr_{it} + b_6 Open_{it}] \ln Y_{it}^{\,2} + b_7 Ineq_{i,t-1} + b_8 Open_{it} + b_9 FinDev_{it} + b_{10} DomCr_{it} + e_{it} \qquad (3)$$

In order to capture the effects of other country-specific variables that data cannot directly control for, we estimate equation (3) as a varying parameter model. The model was tested with the data for the appropriateness of a fixed-effects model against a

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random-parameter model using the Hausman specification test. The test overwhelmingly suggests the fixed-effects model is more appropriate for the data[1]. The results of the estimation yielded the following results:

$$\begin{aligned} Ineq_{it} = & -249.5 + 70.093 \ln Y_{it} - 4.269(\ln Y_{it})^2 + 0.191 Ineq_{it-1} - 0.401 Findev_{it} \\ & (-3.02)^{***} \quad (3.42)^{***} \quad (-3.35)^{***} \quad (1.93)^{*} \quad (-2.20)^{**} \\ & +0.004[(\ln Y_{it})^2 \times Findev_{it}] + 0.028 DomCr_{it} \\ & (1.71)^{*} \quad (0.55) \\ & +0.007[(\ln Y_{it})^2 \times DomCr_{it}] + 0.015 Open_{it} \\ & (0.24) \quad (0.59) \end{aligned} \tag{4}$$

$R^2 = 0.488 \quad no.obs. = 227, \quad no.cntrs. = 57$

Note: Figures in parentheses are the t-statistics.

*, **, and ***: significant at 10, 5, and 1 percent level respectively.

The overall model is significant at 5 percent level. The estimated results clearly suggest that Kuznets' inverted-U relationship holds between inequality as measured by the Gini-coefficient and income. This can be inferred from the statistically significant coefficient of the income variable *ln(Y)* which is positive and the coefficient of $ln(Y)^2$ which is negative[2].

The above regression also supports our hypothesis that financial development affects inequality both directly and indirectly. While the direct effect of *FinDev* (*M2/GDP*) is to reduce inequality directly, it also has an inequality increasing effect as indicated by the positive sign of the interaction term between $[ln(Y)]^2$ and *FinDev*. This effect may be due to increased wealth accumulation by the rich facilitated by the development of the financial market and through inflationary pressure within the economy due to faster monetary expansion that typically occurs during high income growth periods. Using a cleaner model that drops the insignificant variable domestic credit, its interaction with $[ln(Y)]^2$, and the trade-GDP ratio, we find that for a low income economy with a growing per capita income, when the *M2/GDP* ratio is 10 percent, the inequality reducing effect of income starts when per capita income reaches $4000[3]. This

[1] The Hausman chi-square ratio was 40.72 which is significant at 1 percent level and hence rejects the null of the difference between the fixed and random effects coefficients being not systematic.

[2] To see if the inclusion of a cubic term would give us a better specification of the model, we tested with $\ln Y^3$. Unfortunately, the inclusion of the cubic term caused the signs of the coefficients for lnY and $\ln Y^2$ to go in the opposite direction to most theoretical predictions, which made the results insensible. So we dropped the cubic term in the reported specification.

[3] This result is based on the following regression:

$$\begin{aligned} Ineq_t = & -223.92 + 63.92 \ln Y_t - 3.8 (\ln Y_t)^2 - 0.412 FinDev_t + 0.00466[(\ln Y_t)^2 * FinDev_t] + 0.205 Ineq_{t-1} \\ & (3.51) \quad (-3.48) \quad (-2.38) \quad (2.11) \quad (2.11) \end{aligned}$$

The coefficients of income and income squared are statistically significant at 1 percent and other coefficients are significant at 5 percent level.

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'critical level' of per capita income for inequality reduction increases to $6000 when broad money rises to our sample average of 42 percent of GDP. In contrast, for a high degree of financial development, such as 200 percent of GDP, the income per capita required to lower inequality needs to rise to $52,000 in our sample. Thus, we find the Kuznets hypothesis to imply that as *M2/GDP* ratio rises, so does the inequality reducing critical level of income, holding other factors constant. While higher *M2/GDP* may be conducive for decreasing inequality in the short run, over longer runs it exerts an adverse effect on inequality. We note that in light of such a finding it is not surprising that some empirical studies have found evidence contrary to Kuznets' hypothesis (Deininger and Squire, 1998; Fields, 1991; Ravallion and Chen, 1997). Domestic credit and openness to trade seem to have no effect on inequality as measured by the Gini coefficient.

The Kuznets Ratios

A second measure of inequality that is often used is the ratio of income percentages of the top 10 percent in the income distribution to the bottom 10 or 20 percent. Unlike the Gini coefficient, this measure compares how the richest are faring relative to the poorest when national income changes and hence may be more appealing for some purposes. These 'Kuznets ratios' do not always agree with the Gini coefficient, especially when the Lorenz curves drawn for different time periods intersect (see Fields, 1980; Ray, 1998). Within the same theoretical framework as described above, we estimate our inequality model using Kuznets ratios as a measure of income inequality.

In this case, the Hausman specification test supports the random-effects rather than the fixed-effects model for variation in the country-specific terms. The estimated model for the income share of the top 10 percent of population relative to the bottom 10 percent appears below.

$$\begin{aligned} Yshr_{it} = & -280.92 + 65.54 \ln Y_{it} - 3.75 [\ln Y_{it}]^2 - 0.0028 [(\ln Y_{it})^2 * FinDev_{it}] \\ & (-2.15)^{**} \quad (2.06)^{**} \quad (-1.91)^{*} \qquad (-3.1)^{***} \\ & +0.104[(\ln Y_{it})^2 \times DomCr_{it}] - 0.0126[(\ln Y_{it})^2 \times Open_{it}] + 0.112(Open_{it}) \\ & (2.88)^{***} \qquad\qquad (-1.56) \qquad\qquad (1.63)^{*} \end{aligned} \tag{5}$$

$R^2 = 0.160, \quad \text{No.obs.} = 204, \quad \text{No.cntries.} = 57, \quad \text{prob} > \chi^2 = 0.0022$

The numbers in parentheses are the z-statistics,

*, **, and *** indicate significance at 10, 5, and 1 percent respectively.

As shown by the regression, the data support complex relationships between income and inequality. In addition to income and its squares, financial development, domestic private credit, openness to international trade and their interaction with income show significant effects on inequality. Similar to many other cross sectional studies, and as in the case of the Gini coefficient above, the results support the inverted-U relationship. All the

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estimated coefficients except the coefficient of $[(\ln Yit)^2 * Open_{it}]$ are statistically significant at 10 percent level or better. The interaction between openness and squared income misses this significance slightly though it is still significant at 12 percent. The inverted-U relation can occur at a relatively early or later stage of development depending on the strength of other factors. For an economy with growing per capita income, and inequality measured by relative income shares, the financial development affects inequality only indirectly and it reduces inequality instead of raising it. When *M2/GDP* rises from a low level of 10 percent to the sample mean level of 43 percent, the critical per capita income needed to start inequality reduction falls from $2600 to $2200, *ceteris paribus*.

Openness to trade has a direct as well as indirect effect on inequality. The model suggests that greater openness can both accentuate and ameliorate income inequality. However, on balance, it reduces inequality. One may view these two effects as short run and long run effects of international trade on inequality. A simple simulation of the model using the average *M2/GDP* ratio (43 percent) and the average domestic private credit to GDP ratio (45 percent) in our data shows that an increase in openness from a low of 13.5 percent to the average of 62.6 percent would reduce the per capita income needed to achieve a turning point in inequality from $8000 to $2200, ceteris paribus. Overall, trade openness has an inequality-ameliorating effect over time in a growing economy but, consistent with some findings, it may initially accentuate inequality.

The results of the effect of private domestic credit are not as expected. It has been found that greater access to credit seems to increase inequality. It is possible that this variable does not serve as a good proxy for open access to finance, which would be the case if there is a monopoly hold on access to credit, either because of credit rationing under government directives or if the market is highly concentrated in a way that keeps interest rates high. We therefore find a higher rate of domestic credit to GDP ratio raising inequality in our panel. Exercises based on our results suggest that a rise in domestic credit from 10 percent to the sample average of 45 percent at the mean levels of openness and M2/GDP (62.5 and 43 percent respectively) increases the income that is needed to start inequality reduction from $1400 to $2200, *ceteris paribus*.

A similar regression using ratio of the share of the top 10 percent of income and the bottom 20 percent of the distribution as a measure of income inequality yields similar results. All the coefficients have identical signs and are similarly significant at the 5 percent level. In this case, the effect of openness as discussed above is statistically stronger. The positive relationship between trade and inequality in the short run and a negative one in the long run is now statistically significant at better than 10 percent significance level[4].

[4] The estimated regression with coefficients and z stat. (in parentheses) in this case is:

$$Yshare_{it} = \underset{(-2.34)}{-83.66} + \underset{(2.27)}{19.69}\ln Y_{it} - \underset{(-2.08)}{1.11}(\ln Y_{it})^2 - \underset{(-3.61)}{0.0008}[(\ln Y_{it})^2 * FinDev_{it}]$$
$$+ \underset{(3.22)}{0.0306}[(\ln Y_{it})^2 * DomCr_{it}] - \underset{(-1.93)}{0.0041}[(\ln Y_{it})^2 * Open_{it}] + \underset{(1.97)}{0.036}[Open_{it}]$$

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These findings are not very different from those of other studies (see Davis, 2007). They highlight some of the complexity involved in the estimation of the relationship between income and inequality. We note that our paper does not explicitly deal with the issue of a simultaneous process by which factors that affect inequality may also affect income. Yet, the paper sheds some light on the interaction among several important factors that have significant effects on inequality. The net effects are driven by the overall nature of the economy in which the degree of competition in goods and financial markets as well as international openness plays a prominent role.

Comparison of Gini and Income Shares

The results suggest that the worst scenario for inequality when measured by the Gini coefficient occurs with a high level of M2/GDP ratio. When relative income shares are used to measure inequality, the worst scenario occurs with income growth where domestic credit is high, international openness is low, and money supply is a small percentage of GDP.

With the same starting point of inequality for the two measures, we find that a combination of low *M2/GDP* ratio (10 percent), low outward orientation of the economy (10 percent), and high private sector credit to GDP ratio (75 percent) is a bad scenario for inequality based on the ratio of income shares. A possible good scenario is offered by a high *M2/GDP* ratio (70 percent), a high trade to GDP ratio (70 percent), and a low ratio of private domestic credit to GDP (10 percent). The 'critical level' of per capita income needed for the inequality alleviation effect is as high as $13,000 in the bad scenario compared to only $1300 under the good scenario described above. To reach such a level of per capita income takes about 46 years more with a compound annual growth of 5 percent and 77 years more with a growth rate of 3 percent. Between these two scenarios, there are numerous possible combinations of critical income levels and length of time for the Kuznets curve to manifest. Therefore, the inverted Kuznets curve is indeed a strong long term tendency that is influenced by many other institutional and economic factors.

4. Conclusion

The results lend support to Kuznets' inverted-U hypothesis, but this relationship is conditioned by a host of economic and institutional factors that affect growth and income directly or indirectly. The exact shape of the Kuznets curve is also influenced by how one measures inequality as well as by such factors as competitiveness, access to credit, state of financial development, and the extent of outward orientation of the economy. We find some surprising results from our interaction terms, particularly the effect of changes in financial deepening and how those changes influence the level of income that is required for inequality to change course.

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References

Chen, C., 2008, *'Kuznets' inverted-u hypothesis: evidence from county and city of Taiwan*, Master Thesis, Feng Chia University, Taiwan.

Davis, L., 2007, 'Explaining evidence on inequality and growth: informality and redistribution', *B. E. Journal of Macroeconomics*, 7, 1, Article 7.

Deininger, K. and Squire, L., 1996, 'A new data set measuring income inequality', *World Bank Economic Review*, 10, 3, pp. 565-591.

Deininger, K. and Squire, L., 1998, 'New ways of looking at old issues: inequality and growth', *Journal of Development Economics*, 57, pp. 259-287.

Fields, G., 1980, *Poverty, inequality, development*, New York, Cambridge University Press.

Francois, J. and Rojas-Romagosa, H., 2004, 'The construction and interpretation of combined cross-section and time-series income inequality datasets', *World Bank Policy Research Working Paper*, 3748.

Galor, O. and Tsiddon, D., 1996, 'Income distribution and growth: the Kuznets hypothesis revisited', *Economica*, 63, pp. S103-S117.

Higgins, M. and Williamson, J., 2002, 'Explaining inequality the world round: cohort size, Kuznets curves, and openness', *Southeast Asian Studies*, 40, 3, pp. 269-288.

Huang, H., Lin, S., Suen, Y. and Yeh, C., 2007, 'A quantile inference of the Kuznets hypothesis', *Economic Modelling*, 24, pp. 559-570.

Jha, S. 1996, 'The Kuznets curve: a reassessment', *World Development*, 24, 4, pp. 773-780.

Kuznets, S., 1955, 'Economic growth and income inequality', *American Economic Review*, 45, pp. 1-28.

Lee, J., 2006, 'Inequality and globalization in Europe', *Journal of Policy Modeling*, 28, 7, pp. 791-796.

Lopez, J. H. and Guillermo, P., 2008, 'Inequality in Latin America: determinants and consequences', *World Bank Policy Research Working Paper*, 4504.

Lundberg, M. and Squire, L., 2004, 'The simultaneous evolution of growth and inequality', *The Economic Journal*, 113, pp. 326-344.

Ravallion, M. and Chen, S., 1997, 'What can the survey data tell us about recent changes in distribution and poverty?', *World Bank Economic Review*, 11, 2, pp. 357-382.

Ray, D., 1998, *Development economics*, Princeton, NJ, Princeton University Press.

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Thornton, J., 2001, 'The Kuznets inverted-u hypothesis: panel data evidence from 96 countries', *Applied Economics Letters*, 8, 1, pp. 15-16.

Wan, G., Lu, M. and Chen, Z., 2007, 'Globalization and regional income inequality: empirical evidence from within China', *Review of Income and Wealth*, 53, 1, pp. 35-59.

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Appendix

Table: Countries included in the Sample

Country #	Country Name	Region	Income
1	Argentina	LAm	Middle
2	Australia	Oceania	High
3	Bangladesh	Asia	Low
4	Bolivia	LAm	Low
5	Botswana	SSA	Middle
6	Brazil	LAm	Middle
7	Bulgaria	Europe	Middle
8	Canada	NAm	High
9	Chile	LAm	Middle
10	China	Asia	Low
11	Colombia	LAm	Middle
12	Costa Rica	LAm	Middle
13	Cote d'Ivoire	SSA	Low
14	Dominican Rep.	LAm	Middle
15	Ecuador	LAm	Low
16	Egypt, Arab Rep.	SSA	Low
17	Ghana	SSA	Low
18	Honduras	LAm	Low
19	India	Asia	Low
20	Indonesia	Asia	Low
21	Iran, Islamic Rep.	Asia	Middle
22	Jamaica	LAm	Low
23	Japan	Asia	High
24	Jordan	Asia	Middle
25	Kenya	SSA	Low
26	Korea, Rep.	Asia	Middle
27	Lao PDR	Asia	Low
28	Lesotho	SSA	Low
29	Madagascar	SSA	Low
30	Malaysia	Asia	Middle
31	Mauritania	SSA	Low
32	Mexico	NAm	Middle
33	Morocco	SSA	Low
34	New Zealand	Oceania	High
35	Nicaragua	LAm	Low
36	Nigeria	SSA	Low

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37	Pakistan	Asia	Low
38	Panama	LAm	Middle
39	Paraguay	LAm	Middle
40	Peru	LAm	Middle
41	Philippines	Asia	Low
42	Poland	Europe	Middle
43	Romania	Europe	Middle
44	Russian Federation	Europe	Middle
45	Senegal	SSA	Low
46	South Africa	SSA	Middle
47	Sri Lanka	Asia	Low
48	Sweden	Europe	High
49	Thailand	Asia	Middle
50	Tunisia	SSA	Middle
51	Turkey	Europe	Middle
52	Turkmenistan	Asia	Middle
53	United States	NAm	High
54	Uruguay	LAm	Middle
55	Venezuela, RB	LAm	Middle
56	Vietnam	Asia	Low
57	Zimbabwe	SSA	Low

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