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Participation in IMF Programs and Income Inequality

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Abstract

In this paper, I present an empirical analysis of the determinants of income distribution in 108 developing countries over the period 1988 to 1998. The data are the developing-country subset of those used by Milanovic (2005), augmented by information on the cumulative prior participation of the country in IMF programs over the preceding 10 years. Just as in Li et al. (1998), I conclude that the majority of variation in income inequality is cross-cross country in nature: this component of income inequality will depend primarily upon the development characteristics of the countries, and not on participation in IMF programs. I also find, however, that cumulative past participation in IMF programs has a positive effect on the share of income held by the lowest quintile of the population in those countries for which observations are available at different times. This effect is robust to the inclusion of other developmental indicators.

Key words: IMF programs, income inequality, Kuznets U hypothesis
JEL classifications: F33, O15

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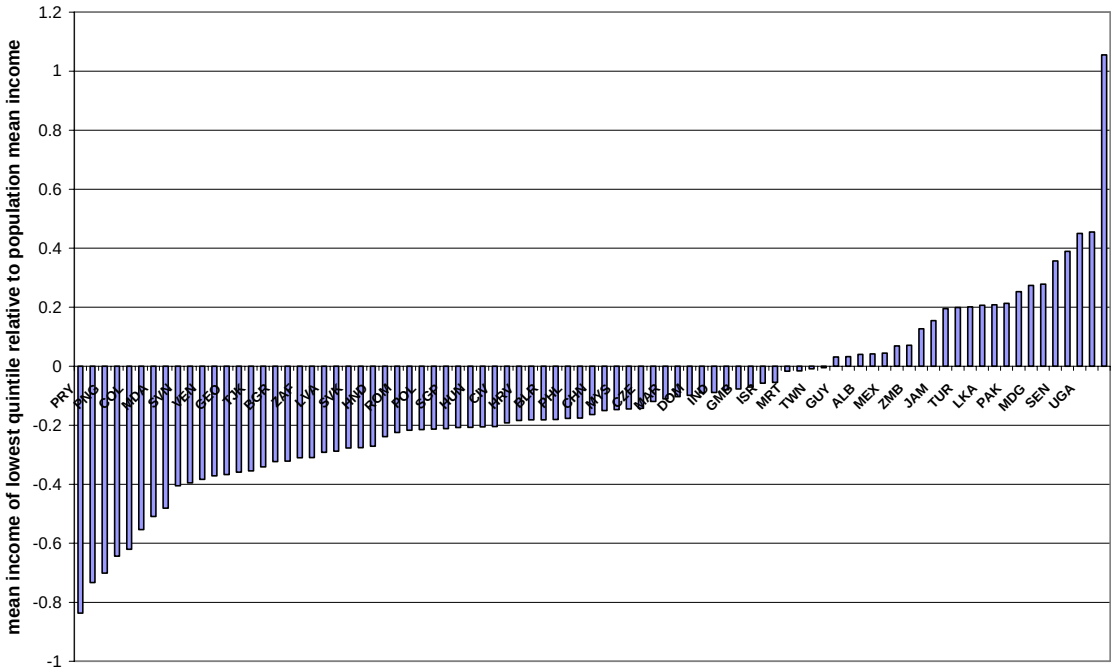
Income within economies became more unequal in the majority of developing and transition economies between 1988 and 1998.[1] Figure 1 illustrates this, with a negative percent change indicating a fall in the mean income of the lowest quintile relative to the population mean: 62 of the 89 countries exhibited a reduction. Concurrently, participation of developing countries in IMF programs grew both in the number of countries participating and in the frequency of the programs in each country.[2] Is there a causal link from the one to the other?

Figure 1: Percent Change in Inequality Ratio, 1988-1998



The determinants of income inequality within countries have been extensively studied.

- Kuznets (1955, 1966) began the discussion with the "inverted-U hypothesis" – the notion that income will become more unequal as countries achieve larger incomes

[1] Figure 1 is based on data collected by Branko Milanovic from household surveys in 108 developing and transition countries. Milanovic (2004) and Milanovic (2005) report details of these data. These data are available at http://econ.worldbank.org/projects/inequality.

[2] This tendency in IMF participation is documented in Conway (forthcoming).

per capita up to a watershed level of income per capita, and then will become more equal with further development. The evidence for this hypothesis has typically been cross-country in nature: ranking the countries j in ascending order by income per capita, the inequality measure for small income per capita will worsen as income per capita increases until a turning point, and then will grow larger on average for countries with still higher per capita income.

- Li et al. (1998) finds in an unbalanced panel of Gini coefficients of middle- and low-income countries that the cross-country differences in income inequality represent about 92 percent in the variation of the Gini while within-country differences were responsible for only 1.4 percent.[3] They identified political liberty and developed financial markets as two potential contributors to income equality, and found in estimation that more-developed financial markets were significantly associated with increased income equality.
- Deininger and Squire (1998) use panel data to demonstrate that the Kuznets curve does not hold intertemporally for a given country. There is evidence in the cross-sectional data of such a relationship. Those in the lowest quintiles of the income distribution see significant increases in relative income from growth-promoting policies.
- Ravallion (2001) discovers an independent effect of openness on income inequality: greater openness is associated with increased inequality among the least developed countries. Dollar and Kraay (2002), by contrast, conclude that openness has similar effects at the top and the bottom of the income distribution,

[3] The remainder was due to definitional differences in Gini computation across countries.

with mean incomes in all deciles rising. Milanovic (2005) summarizes the results of these and other studies of the interaction of openness and inequality by noting that results support both interpretations. His own analysis supports the conclusion that openness, ceteris paribus, leads to increased income inequality.

The contribution of participation in IMF programs to income inequality will be quite complex. The stylized fact that income inequality is relatively unchanging over time suggests that IMF programs may not have measurably large effects on income inequality. The finding that participation in IMF programs will retard economic growth at first but stimulate it in the longer run, first noted by Khan and Knight (1981) and corroborated by Conway (1994), suggests that the program's positive contributions to income equality may only be observed in the longer term. By contrast, the conditionality associated with IMF programs can constrain state welfare spending (for example, income support payments and subsidies) and thus lower the relative income and expenditure of those in the lowest deciles of the population.[4]

Garuda (2000) studied the impact of IMF programs on income distribution (Gini coefficients and the share of total income held by the poorest quintile) through a cross-country estimation strategy. He used the propensity-score method to ensure a matching of participating and non-participating countries, and found that for those countries predicted ex ante to be most likely to participate in an IMF program the impact of participation is to increase income inequality. Interestingly, however, this negative effect of the IMF program is reversed when countries less likely ex ante to participate in IMF programs are considered. Garuda interprets the likelihood of participation to be related to

[4] Rudra (2002) notes that while welfare spending in the OECD countries rose (from 12 to 16 percent) in the period 1972-1995, welfare spending in less-developed countries fell (from 3.2 to 2.5 percent) from 1972 to 1995.

the degree of existing external and internal imbalance: the greater the likelihood, the worse the imbalance. Those countries participating in IMF programs because of severe imbalances are the ones whose income inequality worsens, while those participating with relatively mild imbalances are the ones whose income inequality is reduced.

In this paper, I present an empirical analysis of the determinants of income distribution in 108 developing countries over the period 1988 to 1998. The data are the developing-country subset of those used by Milanovic (2005), augmented by information on the cumulative prior participation of the country in IMF programs over the preceding 10 years.[5] Just as in Li et al. (1998), I conclude that the majority of variation in income inequality is cross-cross country in nature: this component of income inequality will depend primarily upon the development characteristics of the countries, and not on participation in IMF programs. I also find, however, that cumulative past participation in IMF programs has a positive effect on the share of income held by the lowest quintile of the population in those countries for which observations are available at different times. This effect is robust to the inclusion of other developmental indicators.

II. Definitions, methodology and data.

In this paper I will examine the mean income of the lowest quintile of the population relative to the population mean as the measure of income inequality: as the ratio rises, inequality is reduced.[6]

[5] For the transition economies, the cumulative prior participation variable is defined for the preceding five years to ensure coverage.

[6] The data include measures of all quintiles, not just the lowest, and so the analysis of the paper could be extended in the future to describe the evolution of the entire income distribution.

The mean income of quintile i in country j in time t (m_{ijt}) can be defined by the mean income of country j at time t (m_{jt}) and an inequality ratio (I_{ijt}).

$$m_{ijt} = m_{jt}\, I_{ijt} \qquad (1)$$

or $\quad (m_{ijt}/m_{jt}) = I_{ijt}$

By construction, I_{ijt} is non-decreasing with decile: $I_{kjt} \geq I_{ijt}$ for $k \geq i$. Assumption of a Pareto distribution of incomes provides greater structure to the specification. With minimum country-j income of X_{jt} and inequality parameter $k_j > 1$, the mean incomes for quintile i and the inequality ratio I_{ijt} can be rewritten:

$$m_{ijt} = (k_j/(k_j\text{-}1))X_{jt} * 5 * [(1-\alpha_{i-1})^{(kj-1)/kj} - (1-\alpha_i)^{(kj-1)/kj}]$$

$$m_{jt} = (k_j/(k_j\text{-}1))X_{jt}$$

$$I_{ijt} = I_{ij} = 5 * [(1-\alpha_{i-1})^{(kj-1)/kj} - (1-\alpha_i)^{(kj-1)/kj}] \qquad (2)$$

Where α_i represents the upper bound of quintile i: for the lowest quintile, $\alpha_1 = .20$, $\alpha_0 = 0$, and the expression becomes

$$I_{1jt} = I_{1j} = 5 * [1 - (.80)^{(kj-1)/kj}] \qquad (3)$$

In this specification the inequality ratio for the lowest quintile is independent of time but does depend upon the inequality parameter k_j. As k_j rises, the value of I_{1j} converges to unity (and the distribution of income becomes more equal). More generally, k_j will be a

function of time as well. My goal in the following sections is to identify those significant determinants of k_{jt}, and then consider whether IMF participation contributes significantly in addition to those.

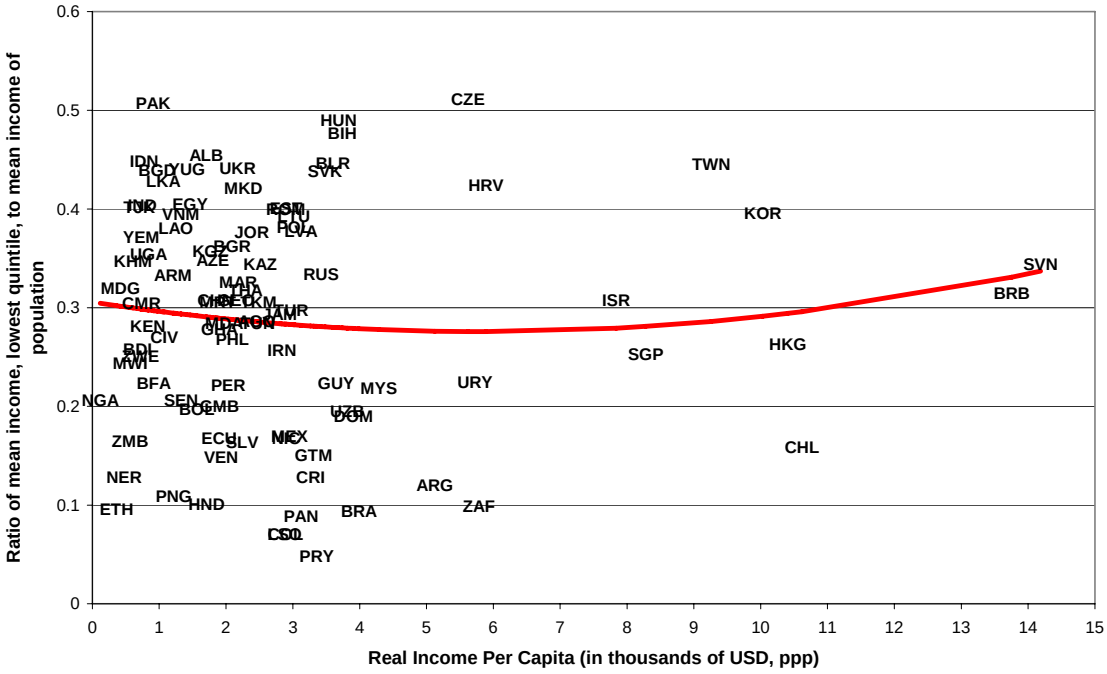
The data used in this paper have been assembled by Branko Milanovic of the World Bank from household surveys at the national level and used in Milanovic (2005). Once developed countries are excluded, there are 108 developing and transition countries for which at least one income-distributional observation is available. Milanovic reports the ratios of mean income by decile to mean income for the country as a whole for the years 1988, 1993 and 1998 when available. Of the 108 countries, there are 19 with observations in only one of the years, 28 with observations in two of the years, and 61 with observations in all three years. In addition to these, Milanovic reports information on other potential explanatory variables: in this paper I will use mean per capita income (y_{mjt}) in purchasing-power-parity terms, the index of democratic institutions (D_{jt}), the openness ratio (O_{jt}), the ratio of M_2 to nominal GDP as an indicator of financial deepening (M_{jt}), the ratio of government expenditure to GDP (G_{jt}) and the real interest rate (R_{jt}). For each of these last five variables, I create the "period t" value by averaging the observations for the previous five years (in other words, the values from t-5 to t-1). I calculate a measure of cumulative prior participation in IMF programs (P_{jt}) from the quarterly series used in Conway (2007), including participation in Stand-by, EFF, Structural Adjustment, Enhanced Structural Adjustment and Poverty Reduction and Growth Facilities. The period-t measure for this variable is the percentage of the time t-10 to t-1 (in years) that the country was participating in IMF programs.[7]

[7] For transition economies, I calculate cumulative participation over the previous five years.

III. Cross-sectional income inequality in developing and transition countries.

The Kuznets U remains a cross-sectional feature of the data on income inequality in developing countries, although when the transition economies are added the relationship becomes less pronounced. Figure 2 illustrates the ratio I_{1j1998} of the mean per capita income for the lowest 20 percent of the population to the mean per capita income for the entire population for each country j in 1998. The Kuznets U pictured is the predicted value calculated by regressing this ratio on the mean and mean squared of per capita income (in ppp terms) in each country.

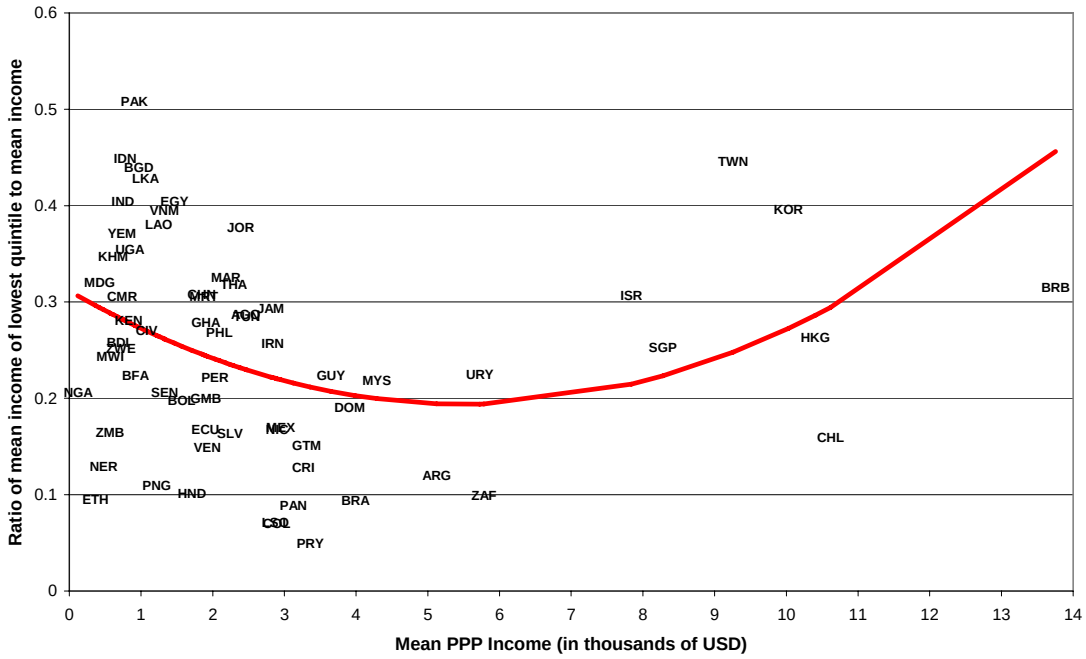
Figure 2: Kuznets U Hypothesis, 1998



Each country's location on the figure is indicated by its three-letter acronym. While a slight U shape is evident, the coefficients of the underlying regression are insignificantly different from zero. Table 1 reports the regression results in the first two columns.

The transition economies tend to lessen the significance of this cross-sectional relationship: they tend to have intermediate real income per capita and relatively high mean income ratios. When the transition economies are excluded in 1998 there are 67 countries remaining; for those, the Kuznets U is significantly evident in the data. The third and four columns in Table 1 report the results of that regression, while Figure 3 illustrates the derived Kuznets curve.

Figure 3: Kuznets' U Hypothesis, 1998, for developing countries alone



While the Kuznets U hypothesis is the most famous of explanations for the evolution of income inequality, the introduction noted a number of other potential explanations: openness, financial deepening, democratic institutions, and the impact of participation in IMF programs. While these have valid theoretical roots, they are in practice quite different to distinguish among. There are two major difficulties in testing these hypotheses in econometric work. The first difficulty is the high correlation among

advances in these various dimensions. Table 2 illustrates the significant correlations (in bold numbers) among measures for the alternative explanations considered by Milanovic (2005). Four of the six, in particular, are significantly correlated with the measure of mean income used in estimating the Kuznets U. The second difficulty is the less-than-complete coverage for some of the empirical measures. There are 258 country/year observations of income share of the lowest quintile in the data set, and complete coverage is only possible with y_{mjt} and P_{jt}. The openness indicator is only available for 86 percent of the sample, and the financial-deepening indicator is only available for 60 percent of the sample. Real interest rates and government expenditures indicators are available for less than half, and when both are included only 1/3 of the sample can be used.

This is unfortunate, for the censoring involved with data availability is not innocuous. Table 3 reports the means of the y_{mjt}, P_{jt} and I_{1jt} variables by availability of explanatory variable. Those missing in each case will have participated less on average in IMF programs than those for which we have data. Those missing in each case also tend to have more equal income distributions than those for which data are available. The countries with $Demo_{jt}$ missing have larger mean income than those for which data are available.

There will thus be a trade-off to keep in mind when adding these explanatory variables with incomplete coverage – more complete hypothesis testing, but for a censored sample.

It is unfortunately beyond the scope of this paper to decipher the common causes of the movements in the explanatory variables.[8] I will assume that the other explanatory

[8] Rodrik et al. (2004) provides a nice econometric decomposition of the contributions of integration and institutional development to economic growth and concludes that "institutions rule".

variables have a potentially non-linear component determined by their level of development, and that the real income per capita is a valid instrument for the level of development. I use cross-country regressions in this sample to identify the component of the variables due to shifts in level of development, and consider the residual from that regression to be the non-development-component of the explanatory variable.[9] For example, if the estimated equation is specified as:

$$O_{jt} = a + b^* y_{mjt} + c^* (y_{mjt})^2 + \varepsilon_{Ojt} \qquad (4)$$

ε_{Ojt} is then the openness indicator used in the regressions. Similar indicators are derived for cumulative prior participation in IMF programs (ε_{Pjt}), democratic institutions (ε_{Djt}) and financial deepening (ε_{Mjt})

Table 4 reports the results of Kuznets regressions building upon Table 1 with the addition of explanatory indicators as regressors. The first pair of regressions in Table 4 is identical to those of Table 1: the left-hand side reports the results for all developing and transition countries, while the right-hand side reports the results for developing countries alone. When the indicator of cumulative prior IMF participation is added, the sign in both sets of regressions is negative – increased prior IMF participation leads on average to increased inequality. This effect is significant for the complete sample, but insignificant for the developing countries alone.

When both IMF participation and country openness indicators are added, ε_{Ojt} has an insignificant coefficient in both sets of regressions – and 14 percent of the observations (all from transition countries) are excluded. This has an important effect on

[9] Those regressions are reported in the appendix Table A1.

the Kuznets U coefficients, with the significant inverted-U shape of the preceding regressions replaced with the expected (though insignificant) U shape. The impact of IMF participation remains significant in the full sample, although smaller in magnitude than in the preceding regression.

When the indicator for democratic institutions is added, the full sample shrinks further to only 80 percent of the original size. The ε_{Djt} increases income inequality in both samples by a comparable and significant amount. IMF participation and openness are both insignificant in this sample. When financial deepening is added, the sample shrinks still further -- to 56 percent of the original size. ε_{Mjt} enters with positive sign and significant coefficient: the greater financial depth of a developing or transition country, the greater the equality of income. The coefficient on ε_{Djt} becomes insignificant, while for the developing-country sample the openness indicator comes in with negative and significant coefficient.

Correlation coefficients among the adjusted variables are reported in Table 5, and these indicate the source of shifting significance and coefficient magnitude as regressors are added.[10] Even after removing the joint dependence on the level of development, these explanatory variables remain highly correlated. Participation in IMF programs is significantly and positively correlated with the degree of democratic institutions, and significantly and negatively correlated with the degree of financial deepening. The more democratic countries also tend to be significantly shallower financially than the less-democratic countries in the sample.

[10] When the correlation matrix is created for 1998 alone, the pattern and magnitude of correlation coefficients is quite similar. This indicates that the pattern observed here is due to cross-country variation rather than time-series variation.

While we may not be able to state a priori the causal relationships between institutional depth, financial depth and openness, we can postulate that participation in IMF programs does not make a significant contribution to the pattern of income inequality across developing countries at any point in time, and does not in transition plus developing countries once other factors (financial depth, democratic institutions) are introduced. In fact, if we expect participation in an IMF program to have an effect on income distribution, we anticipate that its effect will be observed over time. I turn to that possibility in the next section.

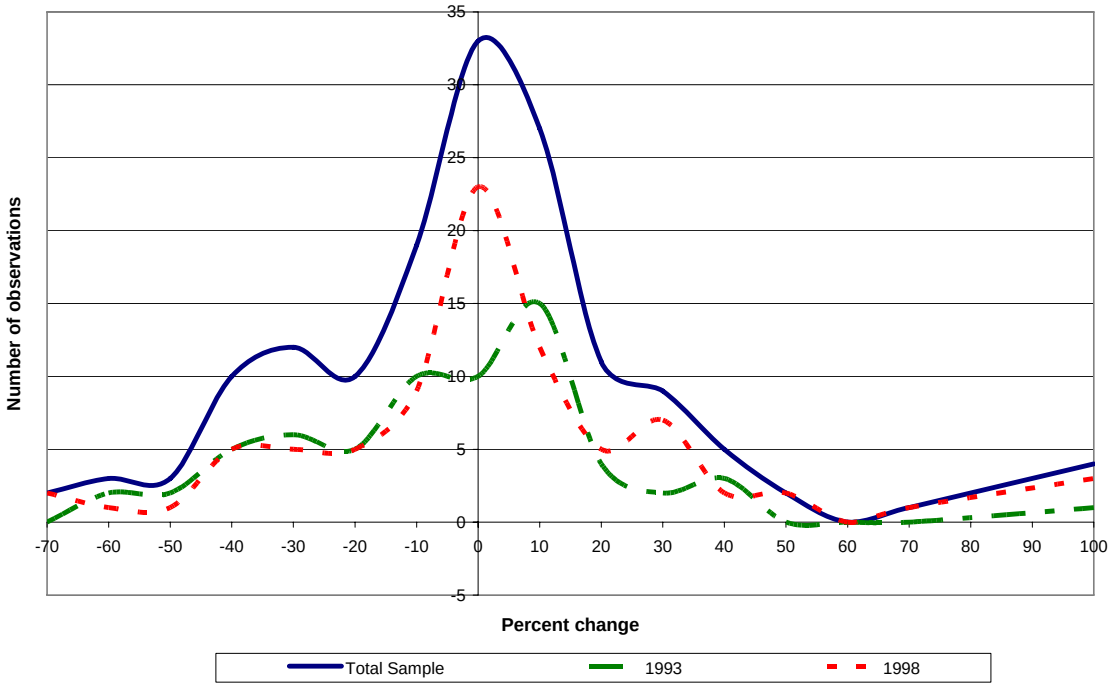
IV. Measuring the intertemporal impact of participation in IMF programs on income inequality.

The derivation of the inequality ratio in equation (3) suggests that deviations in this ratio will be largely due to cross-country differences in k_j. That derivation of the inequality ratio has no intertemporal component at all – a country j will remain with constant I_{1jt} in every t. In reality, the inequality coefficients are not constant. Figure 4 illustrates the empirical frequency of the percentage change in I_{1jt} from the value five years previously.[11] While near-zero change is the modal outcome overall, there are substantial numbers of observations with large percentage changes in this ratio. In this section I investigate whether these changes can be attributed to participation in IMF programs on average.

[11] The graph points measure the number of observations falling in the range from 10 percentage points below to the point listed on the graph. For example, the observations at 0 represent all observations with values between -10 and 0.

The dependent variable in this section is $\lambda_{20jt} = \Delta I_{20jt}/I_{20jt-1}$: the change in inequality ratio in country j from period t-1 (five years previously) to period t. Considering percentage changes should remove the development-level effects, and will also eliminate one observation per country considered. Table 6 reports the results of Kuznets-like regressions on λ_{20jt}.

Figure 4: Distribution of changes in Inequality Ratio over Five Years



The initial panel in Table 6 reports the result of a regression of the percentage change in the inequality ratio on the lagged mean and lagged mean squared of per capita real income.[12] The Kuznets U is evident in the percentage change as well; i.e., the percentage change in the mean income of the lowest quintile relative to overall mean income is initially declining as countries become more developed and then rises for the most-developed countries in the sample. This pattern is evident in all specifications

[12] For example: if the dependent variable is λ_{20k98}, then it measures the percentage change from 1993 to 1998 in mean income of the lowest quintile in country k divided by the mean income for country k. The right-hand side variables are the real per capita income in 1993 in country k and that variable squared.

reported in Table 6. The Wald statistics indicate the joint significance of the two coefficients on per capita real income at the 95 percent level of confidence.

When cumulative participation in IMF programs is added to the regression, the coefficient is both positive and significant on ε_{Pjt} in most specifications.[13] The greater the prior participation in the IMF, the more positive the change in the inequality ratio. The cumulative participation variable lagged one period (i.e., five years) takes the opposite sign but is insignificantly different from zero. As the other potential explanatory variables are added to the regression the coefficient on ε_{Pjt} changes very little in magnitude, while the other explanatory variables always make an insignificant contribution to the regressions. The Wald statistics for these latter cases test the joint significance of the coefficients on the additional variables (ε_{Ojt}, ε_{Mjt}, ε_{Djt}) and reject significance in all cases. While the coefficient on ε_{Pjt} is itself insignificant in the final panel, this is due to the shrinking sample size leading to increased standard errors rather than a reduction in the estimated coefficient.

As a test of the robustness of these results, I included $\Delta y_{mjt}/y_{mjt-1}$, $\Delta\varepsilon_{Pjt}/\varepsilon_{Pjt-1}$, $\Delta\varepsilon_{Mjt}/\varepsilon_{Mjt-1}$, $\Delta\varepsilon_{Djt}/\varepsilon_{Djt-1}$ and $\Delta\varepsilon_{Ojt}/\varepsilon_{Ojt-1}$ as additional regressors in the appropriate regressions, creating an error-correction specification. These contemporaneous percentage-change regressors were always insignificant and never changed the significance of the Kuznets U coefficients or the IMF participation effect.

[13] Inclusion of ε_{Pjt} in this regression means that I am using the cumulative participation in IMF programs from 1988 to 1997 adjusted to exclude development-level effects to explain the percentage change from 1993 to 1998 in the inequality ratio. Inclusion of ε_{Pjt-1} implies that the cumulative participation in IMF programs from 1983 to 1992 would explain the percentage change from 1993 to 1998 in the inequality ratio.

V. Conclusions and extensions.

We can restate the initial hypothesis as follows: once other factors determining income inequality are controlled for, is there an independent and significant effect of participation in IMF programs on income inequality? Based on the evidence provided here, I conclude that it will be difficult to attribute any of the cross-country differences in income inequality to participation in IMF programs. However, there is a significant and pro-equality effect of participation in IMF programs evident in the intertemporal dimension of the data.

The problem in identifying the cross-country effects begins with the difficulty in assigning causality among the potentially important variables, but does not end there. Cross-country regressions like these are based upon the implicit assumption that the process generating income inequality from the independent variables is identical across countries. There are also, as Milanovic (2004) documents, significant differences across countries in administration of household surveys and in calculation of income quantiles. In the end, these results should be taken as suggestive; the rejection of the hypothesis that participation in IMF programs is responsible for cross-country differences in income inequality seems warranted, but will require more detailed work to be made definitive.

The significant impact of IMF programs on the time path of income inequality is evident in these data, but it is important to recognize that for each country there are at most two observations of differenced data. This is not a feature that allows confidence in describing the time path of adjustments in income inequality due to participation in IMF programs, Rather, I establish that on average the participation in IMF programs is significantly associated with an adjustment toward greater income equality.

This does not invalidate the complaint that IMF programs tend to reduce government expenditure on goods targeted to the poor: those complaints may well be true, since government expenditures of this type will in many cases not enter the calculations of inequality based upon household surveys. This concern will be a useful direction for further research.

This research design is predicated on the absence of sub-groups of countries with strongly different experiences; if they exist, these sub-groups should be addressed explicitly. I have begun this in the current paper by redoing the analysis with transition economies excluded. Such an exclusion is natural, since the most important income-distributional event during the data period was the end of the Soviet Union and the relatively more unequal income distributions that followed. Given that the successor states of the Soviet Union had both (a) strongly worsened income equality after independence and (b) no prior participation in IMF programs, the positive effect of participation on income equality could well be an artifact of that event. Redoing the analysis for only the developing countries demonstrates that this was not a defining factor in the results reported here, but more attention to such sub-groups will be useful in future research.

Garuda (2000) serves as the benchmark for work relating IMF programs to income inequality, but due to the difference in research design the results here are not directly comparable. I can suggest one qualification to Garuda's conclusions, and one direction in which this paper should be extended. First, the qualification: Garuda's result that those more in need of IMF programs are more likely to lose from them is probably an artifact of the cross-country dimension of income inequality. Here, the propensity to

participate will be strongly correlated with developmental indicators, and the sorting going on in that paper could simply be the sorting picked up by my developmental regressors. Second, the extension: the participation variable P_{jt} in this paper could be enhanced by considering the prior likelihood of participation. Once the analysis is confined to the intertemporal dimension – one that Garuda (2000) did not consider – the possibility remains that Garuda's conclusions will be re-affirmed here.

Table 1: **Regression results, Kuznets U hypothesis**					
	All developing and transition economies			Excluding transition economies	
	Coefficient	Std. Error		Coefficient	Std. Error
Full Sample:					
Intercept	0.277 *	0.018		0.304 *	0.016
y_{m98}	0.020 *	0.009		-0.027 *	0.009
$(y_{m98})^2$	-0.0014 *	0.0007		0.0025 *	0.001
R^2	0.02			0.05	
F value	2.52			5.19 *	
Critical F(2,N-2)	3.02			3.03	
N	258			186	
1998:					
Intercept	0.304 *	0.028		0.317 *	0.027
y_{m98}	-0.010	0.014		-0.043 *	0.015
$(y_{m98})^2$	0.0009	0.001		0.004 *	0.001
R^2	0.01			0.13	
F value	0.45			4.80 *	
Critical F(2,N-2)	3.11			3.14	
N	93			66	
1993:					
Intercept	0.292 *	0.025		0.295 *	0.025
y_{m93}	-0.002	0.013		-0.021	0.013
$(y_{m93})^2$	0.0004	0.001		0.002	0.001
R^2	0.004			0.02	
F value	0.17			0.55	
Critical F(2,N-2)	3.11			3.14	
N	93			70	
1988:					
Intercept	0.209 *	0.043		0.293 *	0.036
y_{m88}	0.091 *	0.023		-0.011	0.022
$(y_{m88})^2$	-0.007 *	0.002		0.002	0.002
R^2	0.18			0.02	
F value	7.83 *			0.51	
Critical F(2,N-2)	3.13			3.18	
N	72			47	

* indicates significance at 95 degree level of confidence.

Table 2: **Pearson Correlations among independent variables**							
	y_{mjt}	$Open_{jt}$	M_{2jt}/Y_{jt}	$DFIjt/Y_{jt}$	$Demo_{jt}$	Gov_{jt}/Y_{jt}	$Rintr_{jt}$
y_{mjt}							
$Open_{jt}$	**0.40** (223)						
M_{2jt}/Y_{jt}	**0.41** (153)	**0.49** (152)					
DFI_{jt}/Y_{jt}	**0.14** (215)	**0.56** (209)	-0.01 (147)				
$Demo_{jt}$	**0.33** (233)	0.03 (206)	-0.10 (147)	0.13 (201)			
Gov_{jt}/Y_{jt}	0.17 (111)	**0.23** (110)	**0.22** (109)	0.11 (108)	0.06 (109)		
$Rintr_{jt}$	0.10 (122)	-0.06 (122)	0.05 (122)	0.03 (120)	0.06 (117)	-0.00 (85)	
CP_{jt}	**-0.29** (258)	**-0.20** (223)	**-0.39** (153)	-0.03 (215)	0.12 (233)	-0.14 (111)	0.10 (122)

Numbers in parentheses are the number of observations used in calculating correlation.
Statistics in bold are significantly different from zero at 95 percent level of confidence.

Table 3: **Means of Variables of Interest for Missing and non-missing Observations**								
	Number missing	I_{20jt}			CP_{jt}		y_{mjt}	
		Missing	Not missing		Missing	Not missing	Missing	Not missing
$Open_{jt}$	35	0.48	0.29		0.02	0.36	2.86	2.75
$Demo_{jt}$	25	0.36	0.31		0.06	0.34	4.38	2.59
Gov_{jt}/Y_{jt}	147	0.34	0.29		0.25	0.39	2.56	3.04
$Rintr_{jt}$	136	0.35	0.27		0.20	0.43	2.56	3.00
M_{2jt}/Y_{jt}	105	0.35	0.29		0.18	0.39	2.50	2.95

Source: author's calculation.

Table 4: **Independent Impact of Explanatory Variables**					
	All developing and transition economies			Excluding transition economies	
	Coefficient	Std. Error		Coefficient	Std. Error
Full Sample:					
Intercept	0.277 *	0.018		0.302 *	0.017
y_{mt}	0.020 *	0.009		-0.027 *	0.009
$(y_{mt})^2$	-0.0015 *	0.0008		0.0025 *	0.001
R^2	0.02			0.05	
F value	2.52			5.19 *	
Critical F(2,N-2)	3.02			3.03	
N	258			183	
Adding IMF participation:					
Intercept	0.277 *	0.018		0.302 *	0.027
y_{mt}	0.020 *	0.009		-0.027 *	0.015
$(y_{mt})^2$	-0.0014 *	0.0007		0.0025*	0.001
ε_{Pjt}	-0.114 *	0.028		-0.019	0.026
R^2	0.08			0.06	
F value	7.45			3.61 *	
Critical F(2,N-2)	3.02			3.03	
N	258			183	
Adding IMF participation and Openness:					
Intercept	0.299 *	0.017		0.302 *	0.016
y_{mt}	-0.006	0.009		-0.027 *	0.009
$(y_{mt})^2$	0.0007	0.0007		0.0025 *	0.001
ε_{Pjt}	-0.055 *	0.027		-0.022	0.027
ε_{Ojt}	-0.026	0.016		-0.020	0.015
R^2	0.03			0.07	
F value	1.87			3.18 *	
Critical F(2,N-2)	3.02			3.03	
N	223			183	

(continued on following page)

Table 4 continued:					
Adding IMF Participation, Openness and Democratic Institutions:					
Intercept	0.298 *	0.017		0.307 *	0.017
y_{mt}	-0.005	0.009		-0.032 *	0.009
$(y_{mt})^2$	-0.0005	0.001		0.003 *	0.002
ε_{Pjt}	-0.045	0.028		-0.015	0.027
ε_{Ojt}	-0.024	0.017		-0.021	0.016
ε_{Djt}	-0.007 *	0.002		-0.007 *	0.002
R^2	0.06			0.12	
F value	2.70 *			4.62 *	
Critical F(2,N-2)					
N	206			171	
Adding IMF Participation, Openness, Democratic Institutions and Financial Deepening:					
Intercept	0.303 *	0.023		0.327 *	0.019
y_{mt}	-0.008	0.012		-0.049 *	0.010
$(y_{mt})^2$	0.001	0.001		0.004 *	0.001
ε_{Pjt}	-0.026	0.036		0.035	0.031
ε_{Ojt}	-0.048	0.030		-0.099 *	0.026
ε_{Djt}	-0.005	0.003		-0.003	0.002
ε_{Mjt}	0.072 *	0.035		0.121 *	0.033
R^2	0.09			0.28	
F value	2.35			7.16 *	
Critical F(2,N-2)					
N	146			119	

Source: author's calculations. GMM estimation

Table 5: **Pearson Correlations among adjusted variables**

	ε_{Pjt}	ε_{Ojt}	ε_{Djt}	ε_{Mjt}
ε_{Pjt}	**1.00** (258)			
ε_{Ojt}	-0.07 (223)	**1.00** (223)		
ε_{Djt}	**0.24** (233)	-0.11 (206)	1.00 (233)	
ε_{Mjt}	**-0.28** (153)	0.38 (152)	**-0.23** (147)	1.00 (153)

Numbers in parentheses are the number of observations used in calculating correlation.
Statistics in bold are significantly different from zero at 95 percent level of confidence.

Table 6: **Intertemporal Impact of Explanatory Variables on λ_{20jt}**					
	All developing and transition economies			Excluding transition economies	
	Coefficient	Std. Error		Coefficient	Std. Error
Full Sample:					
Intercept	0.090	0.049		0.056	0.057
y_{mt-1}	-0.084 *	0.022		-0.057	0.033
$(y_{mt-1})^2$	0.007 *	0.002		0.005	0.003
R^2	0.07			0.03	
Wald	18.8 *			10.41 *	
N	150			102	
Adding IMF participation:					
Intercept	0.043	0.050		0.016	0.058
y_{mt-1}	-0.076 *	0.022		-0.051 *	0.023
$(y_{mt-1})^2$	0.007 *	0.002		0.005 *	0.002
ε_{Pjt}	0.298 *	0.102		0.270 *	0.135
ε_{Pjt-1}	-0.118	0.101		-0.128	0.123
R^2	0.12			0.07	
Wald	9.24 *			4.01	
N	150			102	
Adding IMF participation and Openness:					
Intercept	0.008	0.055		0.015	0.058
y_{mt-1}	-0.049 *	0.024		-0.051 *	0.024
$(y_{mt-1})^2$	0.005 *	0.002		0.005 *	0.002
ε_{Pjt}	0.260 *	0.114		0.271 *	0.134
ε_{Pjt-1}	-0.113	0.106		-0.129	0.124
ε_{Ojt}	0.100	0.108		0.007	0.137
ε_{Ojt-1}	-0.107	0.101		-0.007	0.128
R^2	0.07			0.07	
Wald	1.20			0.00	
N	117			102	

Table 6 continued:					
Adding IMF Participation and Democratic Institutions:					
Intercept	0.035	0.055		0.019	0.060
y_{mt-1}	-0.068 *	0.028		-0.049	0.027
$(y_{mt-1})^2$	0.006 *	0.003		0.005 *	0.002
ε_{Pjt}	0.317 *	0.105		0.278 *	0.134
ε_{Pjt-1}	-0.133	0.109		-0.094	0.128
ε_{Djt}	-0.005	0.012		-0.016	0.016
ε_{Djt-1}	0.006	0.010		0.006	0.014
R^2	0.12			0.09	
Wald	0.34			1.69	
N	139			98	
Adding IMF Participation and Financial Deepening:					
Intercept	0.024	0.061		0.013	0.062
y_{mt-1}	-0.061 *	0.026		-0.051	0.026
$(y_{mt-1})^2$	0.006 *	0.002		0.005 *	0.002
ε_{Pjt}	0.248	0.134		0.263	0.145
ε_{Pjt-1}	-0.142	0.126		-0.165	0.149
ε_{Mjt}	0.028	0.064		0.016	0.069
ε_{Mjt-1}	0.015	0.064		0.056	0.062
R^2	0.10			0.10	
Wald	0.30			0.91	
N	90			80	

Source: author's calculations; GMM estimation.

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