Inequality, the Price of Nontradables, and the Real Exchange Rate: Theory and Cross-Country Evidence*

By

Hong-Ghi Min

Poverty Reduction Group

The World Bank

January 2002

JEL Classification Numbers: D31, F41
Keywords: Inequality, Price of Nontradables, Real Exchange Rate
Author's E-Mail Address: hmin@worldbank.org

* I am grateful to Richard Adams Jr., Robert Cull, and David Dollar for their very helpful comments but all remaining errors are my own.

Summary

This paper provides theoretical and empirical evidence of a negative association between income inequality and real exchange rates. First, we build a theoretical model showing the transmission mechanism from inequality to real exchange rates. Second, we demonstrate that the theoretical argument have empirical support using cross-country data. The magnitude of association is large, significant, and robust to alternative specifications of the reduced form model and estimation methodologies. Those findings provide empirical support for PRSP since this study indicates that "equity-based growth" and "export-drive" are compatible policies. However, the robustly negative relationship between real exchange rates and inequality does not imply that dramatic redistributive policies will automatically bring real depreciation of the domestic currency, improve the external balance, and accelerate economic growth.

I. Introduction

> *Recently much attention has been paid to whether income inequality favors or hinders economic growth. Does it encourage investment and saving ? Is aggregate consumption higher if inequality is greater ?* (Atkinson and Brandolini, 2001)

A large body of studies on inequality focus inequality's impact on macroeconomic performance across countries. Especially they tried to find the link (1) between inequality and growth [Ahluwalia, 1976: Alesina and Perotti,1996: Alesina and Rodrick, 1994: Barro, 1997: Deininger and Squire, 1996: Kuznets, 1955: Persson and Tabellini, 1994: Summers and Heston, 1991], and (2) between inequality and inflation [Alesina and Tabellini, 1992: Cukierman, 1992: Fisher and Easterly, 1990: Lane, 1997: Rogoff, 1985: Romer, 1993].

In this paper, we try to provide theoretical and empirical evidence as to whether equity-based growth and current account improvement through real exchange rate depreciation are compatible. The Poverty Reduction Strategy Paper (PRSP hereafter) describes the strategy which the government can implement during the next 3-5 years in order to wage a more effective fight against poverty and inequality. The strategy hinges on four major objectives. Acceleration of equity-based growth, guarantee that the poor have access to basic social services, expanding opportunities for employment and income-generating activities for the poor, and promoting good governance. Among others, (1) acceleration of equity-based growth and (2) major structural reforms in order to fully open up the economy to the outside are two major aspects of this strategy.

In other words, PRSP has implications for equity-based growth and export-driven policy. From this point of view, the major channel of connection between "export drive" and "equity-based growth" depends on how a country can maintain the international competitiveness of her exporting industry through sound exchange rate management. Especially, most PRSPs provide a target level of current account to GDP ratio to secure an inflow of physical and financial resources sufficient to achieve their medium to long-term growth target.

However, no attempt has been made to look at how a county's inequality affects the current account performance and thus growth through inequality's impact on real exchange rates. Since real exchange rate affect the external sector performance directly thorough its impact on exporting sector's international competitiveness identification of relationship between inequality and real exchange rate will cast important linkages between inequality and external sector performance. This link is an issue of major concern with important policy implications. A negative relationship would imply that policy makers should be concerned with the distributional implications of government policies not only for social and political reasons but also because inequality has long-run effects on depreciation of the real exchange rate through the changes in the price of nontradables.

Policy makers should take into account the fact that the real exchange rate can affect the poor directly [Adams, R., 2000: Kreuger, A., M. Schiff, and A. Valdes, 1991: The World Bank, 2001].

To test the relevance, significance, and policy implications of the relationship between inequality and the real exchange rate, we build a theoretical model which shows that inequality is negatively associated with real exchange rates. In this way, decreased inequality, through the depreciation of the real exchange rate, improves the current account

performance of a country[1]. Next, we provide cross-country tests of that theoretical proposition.

In section II, we develop a theoretical model of inequality and the real exchange rate. First, we show how changes in inequality affect the price of nontradables. Second, we show how changes in the price of nontradables affects real exchange rates. In section III, we provide empirical evidence for the conceptual arguments established in section II using cross-country data. Section IV concludes the paper.

II. Inequality, the Price of Non-Tradables, and the Real Exchange Rate: A Theoretical Framework

Consider a small open economy that produces two composite goods, tradables and nontradables, which is composed of two heterogeneous income groups that have the same income share, a high income group and a low income group. We can think of the high income group as the highest quartile of the income group in table 3 (53 percent of total income) and the lower income group as the aggregation of other three quartiles (some 55 percent of the total income). The figure does not necessarily sum to 100 since we are using an average of averaged figures over a 10 year period. Statistical test shows that the mean difference between the two groups is 0.0168 (standard error is 0.0075 and p-value is 0.0295).

[1] Agenor (2001) showed that the real exchange rate depreciation increases the welfare of the poor.

Assumption 1. We assume that prices of nontradables are flexible and that the high income group's income elasticity of demand for non-tradables (e^{NT}_{H}) is larger than that of low income group (e^{NT}_{L}) [2].

$$e^{NT}_{H} > e^{NT}_{L} \qquad (1)$$

Assumption 2. Purchasing power parity holds only for tradables .

$$e + P_T^* - P_T = 0 \qquad (2)$$

where e is the nominal exchange rate, P_T^* and P_T are the foreign price of tradables and the domestic price of tradables.

Proposition: If income inequality decreases (increases), ceteris paribus, real exchange rate depreciates (appreciates).

We can write the real exchange rate using the following implicit function:

$$\mathbf{Z} = f(P_{NT,} G) \qquad (3)$$

[2] Chinn (1997) and Samuelson (1964), using the Penn effect, claimed that higher levels of income are associated with greater demand for nontradables such as services, and higher relative price of nontradables. Theoretically, Bergstrand (1991) showed that increased income, under non-homothetic preferences, can lead to a shift in demand toward nontradables and increase in the price of nontradables. .

where Z is the real exchange rate, P_{NT} is the price of nontradables, and G[3] is the Gini coefficient.

$$\frac{\partial Z}{\partial G} < 0 \qquad (4)$$

Proof:

From equation (1), the price of nontradables will be determined by the income changes of the high income group. As a result, the price of nontradables is positively associated with inequality and it can be expressed as follows:

$$\frac{\partial P_{NT}}{\partial G} > 0 \qquad (5)$$

Next, we define the nominal exchange rate as follows:

$$e = P_T - P_T^* \qquad (6)$$

Home and foreign prices can be expressed as in equations (7) and (8).

$$P = (1-\omega) P_T + \omega P_{NT}, \qquad (7)$$

[3] We use the Gini coefficient as a measure of inequality. The income shares of lowest and highest quartiles are employed as supplements to the Gini coefficient.

$$P^* = (1-\omega^*) P_T^* + \omega^* P_{NT}^* \qquad (8)$$

where * denotes the foreign economy, ω is the share of non-traded goods in the economy, and e the nominal exchange rate, which represents the price of foreign currency. All variables are expressed in logs. Equations (7) and (8) assume that the shares of traded and non-traded goods are constant and this is consistent with the data since the manufacturing sector of most countries varies little over long time horizons[4].

We can define real exchange rates, Z, as:

$$Z = e + P^* - P. \qquad (9)$$

Substituting equation (6) - (8) into equation (9) yields the real exchange rate as a function of the domestic and foreign relative prices of non-tradables:

$$Z = (e + P_T^* - P_T) - \omega (P_{NT} - P_T) + \omega^* (P_{NT}^* - P_T^*) \qquad (10)$$

Substituting equation (7) and (8) into equation (6) yields a nominal exchange rate equation as:

$$e = P - P^* - \omega (P_{NT} - P_T) + \omega^* (P_{NT}^* - P_T^*) \qquad (11)$$

[4] Strauss (1999) showed that , for most economies over 30 years, the manufacturing sector varied only 1 to 3.5% of GDP.

If we use equation (3), $(e + P^* - P) = 0$, and thus equation (10) boils down to:

$$Z = -\omega (P_{NT} - P_T) + \omega^* (P_{NT}^* - P_T^*) \qquad (12)$$

Partially differentiating equation (12) with respect to P_{NT} yields equation (13):

$$\frac{\partial Z}{\partial P_{NT}} < 0 \qquad (13)$$

Equation (13) shows that the real exchange rate is a negative function of the price of domestic non-tradables.

Finally, differentiating equation (4) results in equation (14).

$$\frac{\partial Z}{\partial G} = \frac{\partial Z}{\partial P_{NT}} \frac{\partial P_{NT}}{\partial G} \qquad (14)$$

From the first assumption in equation (5)[5] and equation (13), equation (14) has a negative sign:

$$\frac{\partial Z}{\partial G} = \overset{-}{\frac{\partial Z}{\partial P_{NT}}} \overset{+}{\frac{\partial P_{NT}}{\partial G}} < 0 \qquad (15)$$

[5] Since nontradables' demand elasticity for the high income group is greater than that of the low income group, improved income distribution implies decreased demand for nontradables and a decrease in its price.

Equation (15) proposes that improved income distribution, or a decrease in inequality is associated with depreciation of real exchange rates which is denoted by increasing Z.

For the case of worsened income distribution, the proof of real exchange rate appreciation is obvious from the flexible price assumption.

III. Cross-country Evidence on Inequality and the Real Exchange Rate

1. Empirical Model of Inequality and Real Exchange Rates

(1) A Reduced Form Model of Inequality and Real Exchange Rates

To reduce the endogeneity problems we use the real exchange rate as a dependent variable. Alternatively, we can put a measure of inequality as the dependent variable. However, since we do not have any theoretical prior or empirical evidence indicating what determines cross-country differences in inequality, we use the real exchange rate as a dependent variable[6].

We can construct a reduced form model of real exchange rates including as explanatory variables a measure of inequality and identified macroeconomic controls:

$$\mathbf{Z} = (\mathbf{G}, \mathbf{X_i}) \text{ where } i = 1 \text{ to } 9. \qquad (15)$$

[6] Tanzi (1998) provides some descriptive arguments on what determines inequality but his hypothesis does not provide any theoretical or empirical evidence.

where G is a measure of inequality which is often the Gini coefficient and $\mathbf{X}_i$ is a vector of control variables identified in the literature [Faruqee, 1995: Min, 1996]. The literature indicates that the relation between the terms of trade and the real exchange rate is the result of income and substitution effects that depend on the source of the terms of trade variation. The likely result is that a deterioration (improvement) in the terms of trade leads to a real depreciation (appreciation). Liquidity of a country is an important variable that can affects the real exchange rate. The total liquid liabilities of a country are used to capture the effect of inflationary pressure on the real exchange rate.

Net foreign assets (external wealth) are also included in the analysis. Unless the increased foreign assets are sterilized, the likely effect of an increase in net foreign assets will be the appreciation of the real exchange rate (Faruqee, 1995).

Finally, fixed capital formation is included as a proxy for manufacturing sector productivity. According to the Harrod-Balassa-Samuelson effect (Obstfeld and Rogoff, 1996) increased productivity in the manufacturing sector is associated with real depreciation of exchange rates. However, since a reliable measure of productivity in the manufacturing sector is not available for all countries included in this study, fixed capital formation is used as a proxy for the productivity of the manufacturing sector.

Although the focus here is on the relationship between inequality and the real exchange rate, additional structural factors can be included in the analysis whenever proxies are

available for estimation since the literature on the real exchange rate confirms that it responds to the structural development of an economy.

(2) Control variables

To isolate the effect of the macroeconomic policy on the variation of real exchange rates, other than income inequality, we use control variables which are identified in the literature as having long-run stable relationship with the real exchange rate.

Acronyms and definitions are as follows. TOT: terms of trade, NFA: Net foreign assets which are measured by accumulating current account balances with the bench mark figure of 1978, LL: Liquid liabilities of the economy as a measure of liquidity or a measure of inflationary pressure in the economy, PCGDP: Real per capita GDP, TROPEN: Trade openness as measured by export plus import divided by GDP, FIXK: Public investment on fixed capital, OECD: OECD member country dummy, EASIA: East Asia regional dummy, LATIN: Latin America regional dummy.

2. Estimation of Inequality and Real Exchange Rate

(1) Data

The analysis is based on 73 countries and all variables are averaged over 1980-89. Time averaged data are used since the focus of the study is explaining the sustained level of real exchange appreciation or depreciation rather than temporary movements in the real exchange rate. The most important data series is the Gini coefficient which is averaged over ten years and reported in Table 1 .

As supplements to the Gini coefficient, we use the lowest and highest quartile of income shares and those are reported in Table 2 and Table 3. Data for these two quartiles are from Deininger and Squire (1998) and we again average over ten years. Other data are from the IMF's International Financial Statistics CD-Rom (April 1999 version) and World Bank database (2001). Detailed descriptions of definitions and sources of the data are given in the Data Appendix..

(2). Empirical Findings

We used OLS (ordinary least squares), WLS (weighted least squares) to remove the possible heteroscedasticity in the cross-country data. Estimation results for OLS are reported in Table 5 and those for WLS are reported in Table 6.

As we can see from Table 5 and Table 6, the adjusted R-squared tends to be fairly high (around 40 to 50 percent) and estimation results are robust. Most of the control variables and our measure of inequality are significant and the significance and magnitude of the estimates do not vary much across specifications.

First of all, the log of Gini coefficient has the expected sign and is significant throughout all the specifications of the reduced form model. This provides support for the proposition raised in the theoretical part of the paper and it suggests that improvement in income distribution is associated with real exchange rate depreciation. It offers the important policy implication that reducing inequality, by decreasing the price of non-tradables, will depreciate the real exchange rate. This depreciation will, by increasing the international competitiveness of tradable sector, improve the current account balance and accelerate the

economic growth of the economy. Since appreciation of the real exchange rate will hurt the international competitiveness of an economy, inequality has negative implications for sound macroeconomic management. However, the robustly negative relationship between real exchange rates and inequality does not imply that huge redistributive policies will automatically bring real depreciation of domestic currency, improve the external balance, and accelerate economic growth. Among other damaging effects, excessively expansionary redistributive policies motivated by inequality may cause domestic inflation and can distort incentives and hurt productivity which slow down long-term economic growth (Al-Marhubi, 2000).

Log of terms of trade, liquidity, real per capita GDP, and trade openness all have the expected signs and are significant in different specifications. Terms of trade improvement leads to an appreciation as is consistent with theory and other empirical studies [Edwards and van Wijnbergen, 1987: Neary, 1988: Kahn and Ostry, 1991: Tokarick, 1995]. However, regional dummy variables for east Asia and Latin America are insignificant in most cases, and thus we could not find any regional impact on the cross-country behavior of inequality and real exchange rates. Also, the log of net foreign assets (CCA) measured as a cumulative current account with the bench mark figure of 1978 is insignificant throughout the different specification of the model.

Another question is whether different income level have different transmission mechanism from inequality to the real exchange rate. Since we do not have sufficient number of observations for two different categories, OECD dummy variable is included in the estimation to capture the possible role of income level to the transmission mechanism. Estimation results are reported in Table 7.

Table 7 shows that OECD dummy variable is insignificant but all other variables have the same sign, similar estimates and significance varies little. In other words, we could not find any significantly different relationship between inequality and the real exchange rate for the OECD member countries.

Supplementary regressions for equation (15) are run using the highest and lowest quartiles as a proxy for Gini coefficients and estimation results are reported in Table 8 and Table 9. Table 8 reports estimation results of the reduced form model when inequality is measured by the income share of lowest quartile of the population. With different specifications of the reduced form model, the data fit the model quite well (adjusted R-squared is about 50 percent). If we focus on the effect of increasing the income share of lowest quartile (a decrease in inequality) on the real exchange rate, the estimate has the expected positive sign and is significant at a 5 percent level. An increased income of the lowest quartile will decrease the demand for non-tradables and reduce the price of non-tradables. This causes real depreciation of the exchange rate. This is consistent with the previous findings where we used the Gini coefficient as an inequality measure. Table 9 shows the estimation results of the reduced form model when the income share of the highest quartile is used as an inequality measure. However, estimates are insignificant. One possible explanation is that using the highest and lowest quartiles impose the joint hypothesis that income shares of other three quartiles are zero. As we can see from Table 4, this is not the case and regression results in Table 8 and Table 9 provide only suggestive information.

IV. Conclusions.

This paper provides theoretical and empirical support for the notion that "equity-based growth" and "export-drive" are compatible as outlined in the PRSP. More specifically, this paper finds a negative association between income inequality and the real exchange rate. First, we showed that inequality is positively related with the price of nontradables. Second, we showed that improvement in income distribution, through the decline of the price of nontradables, depreciates the real exchange rate. The magnitude of the association is large and estimation results are robust to alternative specifications of the reduced form equations and alternative estimation methodologies. Policy recommendation follow directly from those findings. A sustainable redistributive policy which does not distort incentives can accelerate the growth momentum of the economy through its impact on the real exchange rate depreciation.

Finally, although the analysis has demonstrated a robust negative correlation between the real exchange rate and inequality, the direction of causation has not been determined. This study may serve as a keystone for further theoretical and empirical analysis. Of course the most important task will be the identification of the more sophisticated transmission mechanism for inequality to the price of nontradables. It may also be desirable to look into specific countries' experience as a complement to this cross-country study.

Data Appendix.

(1). Dependent Variables

Gini: Gini coefficients are from Deininger and Squire (1996).

LQ1 – LQ4: Lowest to highest quartile of the income share from Deininger and Squire (1996).

(2). Dummy Variables

EASIA: 1 for East Asia, 0 otherwise.

LATIN: 1 for Latin America, 0 otherwise.

OECD: 1 for member countries, 0 otherwise.

(3). Predetermined Variables

TOT: Terms of trade calculated by dividing export price (IFS line 76) by import price (IFS line 76.x). For those countries whose value is missing in IFS, we get the export price by dividing current export (import) of goods and non-factor services by 1995 constant price export (import) of goods and non-factor services in the World Bank database.

FIXK: Fixed capital formation to GDP (IFS line 99.b) measured by domestic public (and private) investment to GDP. This is used as a proxy for the manufacturing sector productivity since many developing countries do not have good data to estimate it.

LL: Liquid liability to GDP. Liquid liability equals currency plus demand and interest bearing liabilities of banks and other financial intermediaries.

NFA: Net foreign asset measured by cumulative current account (IFS line 77.ad) deficit/surplus with a benchmark figure of 1987.

RCGDP: Real per capita GDP, nominal per capital GDP is deflated by GDP deflator.

TROPEN: Trade openness is measured as a sum of export (IFS line 70) and import (IFS line 71) divided by GDP.

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Table 1. Gini coefficients for 73 Countries

Country	Gini	Country	Gini	Country	Gini
Algería	**38.73**	Ireland	**37.72**	Switzerland	**28.53**
Australia	**39.33**	Italy	**33.42**	Taiwan	**29.05**
Austria	**25.84**	Jamaica	**43.35**	Thailand	**46.00**
Bahamas	**44.42**	Japan	**35.20**	Trinidad	**41.72**
Bangladesh	**35.21**	Jordan	**38.45**	Tunisia	**43.00**
Belgium	**26.43**	Korea, R.	**33.58**	Uganda	**33.00**
Bolivia	**42.04**	Lesotho	**56.02**	UK	**27.32**
Brazil	**57.06**	Malawi	**58.30**	USA	**36.92**
Cameroon	**49.00**	Malasia	**48.48**	Venezuela	**44.02**
Canada	**31.50**	Mauritania	**42.53**	Yugoslavia	**32.74**
Chile	**52.24**	Mauritius	**42.67**	Zimbabwe	**56.83**
China	**31.51**	Mexico	**52.78**		
Colombia	**51.20**	Moroco	**39.19**		
Costa Rica	**44.91**	Nepal	**30.06**		
Cote d'Ivoire	**39.18**	Netherlands	**28.58**		
Denmark	**32.07**	New Zealand	**35.31**		
Dom. Rep.	**46.88**	Nigeria	**37.02**		
Ethiopia	**32.42**	Norway	**31.69**		
Fiji	**42.50**	Pakistan	**32.04**		
Finland	**32.16**	Panama	**51.97**		
France	**34.91**	Peru	**46.05**		
Germany	**33.32**	Philippines	**45.91**		
Ghana	**36.32**	Poland	**27.29**		
Greece	**34.24**	Portugal	**35.35**		
Guatemala	**56.66**	Rwanda	**28.90**		
Honduras	**54.33**	Seychelles	**47.00**		
Hong Kong	**40.16**	Singapore	**40.67**		
Hungary	**22.82**	South Africa	**49.67**		
India	**31.43**	Spain	**25.68**		
Indonesia	**33.44**	Sri Lanka	**44.67**		
Iran	**42.90**	Sweden	**31.57**		

Note: Reported figures are averaged value from 1980 to1989.

Table 2. Income Share of the Lowest Quartile for 73 Countries

Country	LQ1	Country	LQ1	Country	LQ1
Algeria	0.0680	Ireland	0.0492	Switzerland	0.0681
Australia	0.0542	Italy	0.0820	Taiwan	0.0824
Austria	NA	Jamaica	0.0526	Thailand	0.0420
Bahamas	0.0321	Japan	0.0615	Trinidad	0.0343
Banglades	0.0758	Jordan	NA	Tunisia	NA
Belgium	0.0854	Korea, R.	0.0656	Uganda	NA
Bolivia	NA	Lesotho	0.0287	UK	0.0895
Brazil	0.0292	Malawi	NA	USA	0.0476
Cameroon	NA	Malaysia	0.0439	Venezuela	0.0484
Canada	0.0675	Mauritania	0.0353	Yugoslavia	0.0715
Chile	0.0370	Mauritius	0.0649	Zimbabwe	NA
China	0.0699	Mexico	0.0365		
Colombia	0.0370	Morocco	NA		
Costa Rica	0.0407	Nepal	0.0911		
Cote d'Ivoire	0.0649	Netherlands	0.0845		
Denmark	0.0594	New Zealand	0.0582		
Dom. Rep.	0.0480	Nigeria	0.0696		
Ethiopia	NA	Norway	0.0721		
Fiji	NA	Pakistan	0.0846		
Finland	0.0681	Panama	0.0310		
France	0.0658	Peru	0.0624		
Germany	0.0678	Philippines	0.0520		
Ghana	0.0696	Poland	0.0997		
Greece	0.0663	Portugal	0.0553		
Guatemala	0.0240	Rwanda	0.0970		
Honduras	NA	Seychelles	NA		
Hong Kong	0.0571	Singapore	0.0652		
Hungary	0.1088	South Africa	NA		
India	0.0875	Spain	0.0897		
Indonesia	0.0781	Sri Lanka	0.0622		
Iran	NA	Sweden	0.0720		

Note:
1. LQ1 is the income share of the lowest quartile of the population.
2. Reported figures are averaged value from 1980 to1989.

Table 3. Highest Quartile's Income Share of 73 Countries

Country	LQ4	Country	LQ4	Country	LQ4
Algeria	0.5345	Ireland	0.5590	Switzerland	0.5742
Australia	0.5787	Italy	0.6163	Taiwan	0.6211
Austria	NA	Jamaica	0.5099	Thailand	0.4720
Bahamas	0.5362	Japan	0.5934	Trinidad	0.5514
Banglades	0.0758	Jordan	NA	Tunisia	NA
Belgium	0.6509	Korea, R.	0.5687	Uganda	NA
Bolivia	NA	Lesotho	0.4001	UK	0.6136
Brazil	0.0292	Malawi	NA	USA	0.5685
Cameroon	NA	Malaysia	0.4654	Venezuela	0.5060
Canada	0.6196	Mauritania	0.5368	Yugoslavia	0.6024
Chile	0.3700	Mauritius	0.5719	Zimbabwe	NA
China	0.5548	Mexico	0.4240		
Colombia	0.4410	Morocco	NA		
Costa Rica	0.4940	Nepal	0.6050		
Cote d'Ivoire	0.5382	Netherlands	0.6402		
Denmark	0.6251	New Zealand	0.6012		
Dom. Rep.	0.4825	Nigeria	0.5580		
Ethiopia	NA	Norway	0.6147		
Fiji	NA	Pakistan	0.5915		
Finland	0.6288	Panama	0.4389		
France	0.5803	Peru	0.4601		
Germany	0.6179	Philippines	0.4790		
Ghana	0.5632	Poland	0.6524		
Greece	0.5958	Portugal	0.5750		
Guatemala	0.3745	Rwanda	0.6108		
Honduras	NA	Seychelles	NA		
Hong Kong	0.5129	Singapore	0.5341		
Hungary	0.6621	South Africa	NA		
India	0.5923	Spain	0.6542		
Indonesia	0.5800	Sri Lanka	0.5296		
Iran	NA	Sweden	0.6156		

Note:
1. LQ4 is the income share of the highest quartile of the population.
2. Reported figures are averaged value from 1980 to1989.

Table 4. Summary Statistics of Each Quartile's Income Shares

Lowest Quartile (LQ1)			
Sample Mean	0.06228524812**		
SE of Sample Mean	0.002612		
Skewness	0.04424	Significance Level (Skewness=0)	0.89340647
Kurtosis	-0.54303	Significance Level (Ku=0)	0.42722927
Second Lowest Quartile (LQ2)			
Sample Mean	0.16998022842**		
SE of Sample Mean	0.005965		
Skewness	-0.65496*	Significance Level (Skewness=0)	0.04729999
Kurtosis	0.52146	Significance Level (Kurtosis=0)	0.44581196
Third Lowest Quartile (LQ3)			
Sample Mean	0.32168379866**		
SE of Sample Mean	0.010227		
Skewness	-1.54048**	Significance Level (Skewness =0)	0.00000308
Kurtosis	3.50541**	Significance Level (Kurtosis=0)	0.00000030
Highest Quartile (LQ4)			
Sample Mean	0.53711378685**		
SE of Sample Mean	0.015292		
Skewness	-2.65163**	Significance Level (Skewness=0)	0.00000000
Kurtosis	9.08144**	Significance Level (Kurtosis=0)	0.00000000

Note: Double asterisks(**) denote that estimates are significant at 1 percent critical level and single asterisk(*) at 5 percent critical level.

Table 5. Cross-Country Real Exchange Rate Regression: OLS

Independent Variables	**(1)**	**(2)**	**(3)**
Constant	3.43 (0.93)**	3.51 (0.93)**	3.20 (0.95)**
Log (GINI)	**-0.52 (0.21)***	**-0.51 (0.21)***	**-0.45 (0.21)***
Net Foreign Asset (CCA)	0.52 (0.46)	—	—
Log (TOT)	-0.37 (0.13)**	-0.39 (0.13)**	-0.37 (0.13)**
Log (LL)	-0.38 (0.10)**	-0.35 (0.10)**	-0.34 (0.11)**
Log (Real PCGDP)	0.11 (0.05)*	0.11 (0.05)*	0.11 (0.05)*
Log (FIXK/Y)	1.69 (0.92)	1.65 (0.92)	—
Log (TROPEN)	-0.13 (0.06)*	-0.13 (0.06)*	-0.14 (0.06)*
EASIA	0.21 (0.10)*	0.20 (0.10)	—
LATIN	0.15 (0.01)	0.15 (0.10)	0.01 (0.10)
Adjusted R-squared	0.43	0.42	0.38
Degrees of Freedom	42	43	45
Standard Error	2.91	2.90	2.91

Note:
1. While double asterisks denote significance of the estimates at 1 percent critical level, single asterisk denotes their significance at 5 percent critical level.
2. Dependent variable is log of real exchange rates.

Table 6. Cross-Country Real Exchange Rate Regression: WLS

Independent Variables	**(1)**	**(2)**	**(3)**
Constant	3.16 (0.83)**	3.22 (0.84)**	2.91 (0.80)**
Log (GINI)	**-0.52 (0.21)***	**-0.43 (0.18)***	**-0.33 (0.16)***
Net Foreign Asset (CCA)	0.74 (0.46)	__	__
Log (TOT)	-0.38 (0.11)**	-0.40 (0.11)**	-0.37 (0.13)**
Log (LL)	-0.40 (0.09)**	-0.35 (0.09)**	-0.39 (0.09)**
Log (Real PCGDP)	0.12 (0.05)*	0.15 (0.04)**	0.15 (0.04)**
Log (FIXK/Y)	1.98 (0.68)**	1.81 (0.69)*	1.81 (0.70)*
Log (TROPEN)	-0.11 (0.06)	-0.12 (0.06)*	-0.10 (0.06)*
EASIA	0.21 (0.08)*	0.19 (0.08)*	0.17 (0.08)*
LATIN	0.11 (0.09)	0.10 (0.09)	__
Adjusted R-squared	0.50	0.48	0.48
Degrees of Freedom	42	43	44
Standard Error	0.80	0.80	0.80

Note:
1. While double asterisks denote significance of the estimates at 1 percent critical level, single asterisk denotes their significance at 5 percent critical level.
2. Dependent variable is log of real exchange rates.

Table 7. Cross-Country Real Exchange Rate Regression:

OECD Countries Dummy

Independent Variables	**(1)**	**Independent Variables**	**(2)**
Constant	3.33 (0.95)**	Constant	3.32 (0.99)**
Log (GINI)	**-0.44 (0.19)***	***Log (GINI)***	**-0.48 (0.22)***
Net Foreign Asset (CCA)	0.61 (0.48)	*Net Foreign Asset (CCA)*	0.53 (0.49)
Log (TOT)	-0.39 (0.13)**	*Log (TOT)*	-0.36 (0.13)*
Log (LL)	-0.44 (0.10)**	*Log (LL)*	-0.39 (0.11)**
Log (Real PCGDP)	0.12 (0.06)**	*Log (Real PCGDP)*	0.12 (0.06)**
Log (FIXK/Y)	1.40 (0.96)	*Log (FIXK/Y)*	1.46 (1.00)
Log (TROPEN)	-0.12 (0.06)	*Log (TROPEN)*	-0.13 (0.06)*
EASIA	-0.13 (0.08)*	***LATIN***	0.07 (0.11)
OECD	**-0.13 (0.12)**	***OECD***	**-0.09 (0.13)**
Adjusted R-squared	0.41	Adjusted R-squared	0.38
Degrees of Freedom	42	Degrees of Freedom	42
Standard Error	0.29	Standard Error	0.29

Note:
1. While double asterisks denote significance of the estimates at 1 percent critical level, single asterisk denotes their significance at 5 percent critical level.
2. Dependent variable is log of real exchange rates.

Table 8. Cross-Country Real Exchange Rate Regression:
Log of Lowest Quartile(LLQ1) as a Measure of Inequality

Independent Variables	**(1)**	**(2)**	**(3)**
Constant	2.81 (0.74)**	2.85 (0.71)**	2.65 (0.72)**
Log (LQ1)	**0.33 (0.13)***	**0.33 (0.12)***	**0.18 (0.09)#**
Net Foreign Asset (CCA)	0.13 (0.41)	—	—
Log (TOT)	-0.19 (0.01)**	-0.44 (0.15)**	-0.48 (0.15)**
Log (LL)	-0.43 (0.15)	-0.19 (0.11)	-0.25 (0.11)
Log (Real PCGDP)	0.11 (0.06)	0.11 (0.06)	0.14 (0.06)**
Log (FIXK/Y)	1.59 (0.91)	0.16 (0.89)	1.81 (0.07)*
Log (TROPEN)	-0.17 (0.06)**	-0.17 (0.06)**	-0.18 (0.06)**
EASIA	0.19 (0.10)	0.18 (0.09)	0.13 (0.10)
LATIN	0.18 (0.11)	0.18 (0.11)	—
Adjusted R-squared	0.48	0.48	0.47
Degrees of Freedom	30	31	32
Standard Error	2.58	2.58	2.58

Note:
1. While double asterisks denote significance of the estimates at 1 percent critical level, single asterisk denotes their significance at 5 percent critical level and # denotes its significance at 6 percent critical level.

2. Dependent variable is log of real exchange rates.

Table 9. Cross-Country Real Exchange Rate Regression: Log of Highest Quartile(LQ4) as a Measure of Inequality

Independent Variables	**(1)**	**(2)**	**(3)**
Constant	2.04 (0.74)**	2.07 (0.71)**	2.03 (0.67)**
Log (LQ4)	-0.04 (0.07)	-0.04 (0.07)	-0.04 (0.07)
Net Foreign Asset (CCA)	0.09 (0.45)	—	—
Log (TOT)	-0.45 (0.17)*	-0.46 (0.16)**	-0.45 (0.16)**
Log (LL)	-0.19 (0.13)	-0.19 (0.12)	-0.17 (0.11)
Log (Real PCGDP)	0.11 (0.07)	0.11 (0.07)	0.11 (0.06)
Log (FIXK/Y)	1.32 (0.99)	1.32 (0.99)	1.24 (0.91)*
Log (TROPEN)	-0.17 (0.07)*	-0.17(0.07)*	-0.17 (0.07)*
EASIA	0.12 (0.11)	0.11 (0.11)	0.12 (0.10)
LATIN	-0.02 (0.09)	-0.02 (0.09)	—
Adjusted R-squared	0.37	0.39	0.41
Degrees of Freedom	30	31	32
Standard Error	2.58	2.58	2.58

Note:

1. While double asterisks denote significance of the estimates at 1 percent critical level, single asterisk denotes their significance at 5 percent critical level.
2. Dependent variable is log of real exchange rates.