MACROECONOMIC DETERMINANTS OF THE INCOME SHARES OF THE VERY HIGHEST INCOME GROUPS

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ABSTRACT

By nature, people are guided by self-interests. Although all income groups have a stake in economic matters, the highest income groups are likely to have a much greater say in affecting the macro economy. Identifying the interests of higher income groups with regard to the economy is, therefore, important. It suggests where the effective energies of these potent groups are likely to be channeled, and allows one to assess the extent to which their objectives are in tune with the agenda of the broader society. This study uses the Phillips-Hansen fully modified OLS procedure to investigate the interrelationship between four key macroeconomic variables and the seven topmost income shares. We find that the extent of trade, inflation rate, unemployment, and real interest rate are highly significant in explaining the shares of the highest income groups in the United States.

Keywords: Income Inequality, inflation rate, unemployment rate

JEL Classifications: A10

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I. INTRODUCTION

Economists have long been interested in examining the trends in the distribution of income and its relationship with economic variables. Much of the recent empirical work started after the seminal paper by Kuznets (1955) where he postulated a u-shaped relationship between economic progress and income equality. In a recent study, Argitis and Pitelis (2001), using a cost plus pricing model, theorize a relationship between the nominal interest rate and the relative income share of industrial relative to financial capital. They find that the share is negatively related to the interest rate for both the United Kingdom and the United States. As another current example, Baldacci, De Mello, and Inchauste (2002) look at the effect of financial crises on the income shares of the poor. They find, that during the 1994-1995 crisis for Mexico, that, although absolute Mexican incomes fell, that income share of the poorest one-fifth of the population rose, while that of the richest tenth fell. The U.S. economy, over the last two decades, experienced a significant increase in income inequality. The incomes of the richest families continued to grow while the middle-income group made much smaller income gains and the income of the poor families actually shrank (Burtless, 1999).

This study falls within the tradition of studying income shares and their relation to the economy. The uniqueness of the study is that it focuses on the shares of the very highest income groups using data that has just recently been made available on the shares of these groups for the United States based on income tax returns. Specifically, for the U.S., the study looks at the relationship between four important macroeconomic variables and the income shares of the very

highest income groups. By the very highest groups are meant the group with share of income of the top one percent of the population all the way up to the group with the share of the top one hundredth percent.   The four variables are the extent of trade, the rate of inflation, real interest rate and the rate of unemployment. The major findings of the study are that the extent of trade is positively and significantly related to the income share of the top income groups, but both the rate of inflation and the unemployment rate are negatively related to the income share of the to income top income groups. In terms of the conventional IS-LM model it is suggested that the very highest income groups in the U. S. may have a preference for tight monetary and easy fiscal policies.

The paper is organized as follows. Section one provides an overall view on the relationship between the four macroeconomic variables and the shares of the highest income groups. Throughout, it is assumed that its share captures the interest of a group. While arguments may be made that the absolute amount of income is what matters, it will be presumed that beyond a certain point of income, a threshold for which these groups have surely surpassed, the absolute amount has little bearing, and only the relative amount matters. Section two profiles the highest income groups in the United States economy.   Section three details the methodology of the study. Section four discusses the empirical results. Finally, the last section furnishes the conclusions and policy implications of the study.

II. THE HIGEST INCOME GROUPS AND THE ECONOMY

In almost every society the highest income groups wield tremendous power and influence. Economists generally assume that individuals and groups of individuals base their behavior on self-interests. This means that they will tend to promote things that are good for them, or for the

group to which they belong, and to fight against things that they perceive as not being efficacious for them or for the group to which they identify with. With regard to the macro economy, what are the interests of the top income groups? At issue is whether macroeconomic variables affect the income shares of the highest income groups.

The purpose of this paper is to use newly available data on the topmost income shares for the U.S. economy provided by Piketty and Saez (2001) to assess the effects of four important macroeconomic variables, the extent of international trade, the rate of inflation, the rate of unemployment, and the interest rate on the income shares of the very highest income groups.

It is difficult, a *priori*, to ascertain any definite relationship between these variables and the income inequality. However, based on economic reasoning one would expect that high inflation and high unemployment may not increase the income share of the very rich while trade liberalization may do so through its effect on business profits. The economic logic for the selection of these variables is as follows. The inflation rate and the unemployment rate are rather obvious choices. If one were to survey economists around the world asking them for key variables to profile an entire macro economy and limiting their choice to only two variables, then these two variables would surely make the list in a large number of cases. Macroeconomics considers unemployment and inflation as two of its major problems. The extent of trade is selected because of the recent globalization of the world economy, and the intense public concern over its consequences. Interest rate is selected because the highest income groups own a considerable amount of financial assets in the United States. Can anything be definitely said beforehand, as to the position of the highest income groups with regard to the extent of trade, inflation, interest rate, and unemployment, or, at least, can some intuitive guesses be made?

As a general assumption, especially in the U.S., it is reasonable to assume that the fortunes of upper income groups are intimately tied up with business. It is the members of high-income groups that sit on the boards of directors of major corporations, and are the major stockholders and owners of business. It is individuals from the upper income groups that form the ranks of the chief executive officers of corporations.

Trade is generally good for business. While individual industries may suffer from trade due to a comparative disadvantage in terms of stiffer competition and reduced sales, as a whole business gains from trade. Trade provides an extended market, the possibilities of achieving greater economies of scale, and the potential for reduced input costs from lower commodity and import prices. Furthermore, the new international structure of business puts high-income groups in a strong bargaining position relative to common workers. A chief executive officer managing a large international company suffers little threat of losing his position; indeed, his position is likely to be strengthened, if production is shifted from one country to another for efficiency reasons. However, in the country in which industry shifts out, local workers must bear the costs of reallocation.

To the extent that inflation is detrimental to economic growth, it will be bad for business expansion, and, therefore, disparaged by the upper income groups. However, inflation may give business greater pricing power. To the degree that inflation represents a successful outcome by higher income groups in the struggle over the distribution of income, these groups will tend to favor inflation

With respect to the rate of unemployment, there are again forces that tend to operate in diverse directions. The question is, net, on balance, which force tends to dominate with regard to the shares of upper income groups. On the one side of the ledger, lower unemployment spells

better business conditions with its accompanying higher sales and greater profit potential. On the other hand, lower unemployment may result in a less disciplined labor force with greater worker bargaining power. This could result in higher labor costs and smaller profits. If the latter force dominants, then the interests of the upper income groups would not be in line with ordinary folks, but if the former force dominates, then they would be.

Lastly, interest rate is one of the key variables heavily followed by the business community and the media. The financial press never tires of following the Federal Reserve and monetary activity. Interest rate is the penultimate monetary policy variable. Low interest rates are, in general opinion, viewed as favorable to economic growth. The conventional wisdom is that lower rates represent a reduced cost of capital. This lower capital cost spurs higher levels of real investment culminating in greater economic growth.

Given that the high-income groups own a substantial amount of financial assets, the interest rate is likely to be of some relevance to their financial prosperity. The overall effect of interest rate on the shares of the highest income groups is somewhat ambiguous. It depends on the outcome of the battle between opposing forces. On the one hand, since higher income groups are in possession of a large amount of financial wealth, higher interest rates are likely to spell a greater rate of return on their financial assets. This has favorable implications for the shares of the higher income groups. On the other hand, the higher income groups are closely connected with business, and higher interest rates entail greater capital costs. This is a negative factor with regard to their shares.

III. METHODOLOGY

The unit root tests were undertaken in the frameworks of the augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1979) and the Phillips-Perron (PP) (Phillips and Perron, 1988). The

unit root tests are conducted with and without a deterministic trend (t). The ADF test is based

on the following regression equation:

$$\Delta X_t = \alpha_0 + \beta_1 X_{t-1} + \sum_{i=1}^{m} \theta_i \Delta X_{t-1} + \varepsilon_t$$

(1)

$$\Delta X_t = \alpha_0 + \beta_1 X_{t-1} + \delta t + \sum_{i=1}^{m} \theta_i \Delta X_{t-1} + \varepsilon_t \qquad (2)$$

where, Δ is the first-difference operator, t is the time trend, and ε is the stationary random

error, and m is the maximum lag length. Equation (1) is estimated without time trend. Equation

(2) on the other hand, is estimated with time trend. The null hypothesis is that the series contains

unit root, which implies that $\beta_1 = 0$. The null hypothesis is rejected if β_1 is negative and

statistically significant. However, the ADF test loses power for sufficiently large values of m.

As a result, the PP test that allows weak dependence and heterogeneity in residuals is

implemented. The PP unit root test is based on the following regression:

$$Y_t = \alpha + \beta_1 Y_{(t-1)} + \varepsilon_t$$

(3)

$$Y_t = \alpha + \beta_1 Y_{(t-1)} + \varphi T + \varepsilon_t \qquad (4)$$

where T represents time trend and ε is the error term. The null hypothesis is that H0: $\beta_1 = 1$ in

equation (4). The alternate hypothesis H0: $\beta_1 < 1$. The Phillips-Perron unit root test is

conducted with and without time trend, as in equations (3) and (4), respectively.

We proceed with cointegration test, provided the time series are integrated of order one

(i.e. I(1)). The Johansen (1991) and Johansen and Juselius (1990) cointegration procedure is used

to determine the long run relationship between the variables in the system. The procedure involves the estimation of the following vector error-correction model (VECM):

$$\Delta X_t = \Psi_0 + \sum_{i=1}^{p-1} \Psi_i \Delta X_{t-i} + \alpha\beta' X_{t-p} + \varepsilon_t \tag{5}$$

where, Δ represents difference operator, p is the maximum lag, X_t stands for (income shares, extent of trade, inflation and unemployment), Ψ_0 is a constant, and ε represents the vector of white noise process. The matrix β consists of r ($r \leq n$ -1) cointegrating vectors. On the other hand, the matrix α holds the error correction parameters. In equation (5), the null hypothesis is that the matrix ($\Pi = \alpha\beta'$) has a reduced rank of $r \leq n$ - 1. The alternative hypothesis, on the other hand, is that the matrix ($\Pi = \alpha\beta'$) has full rank. The Johansen and Juselius cointegration technique produces two likelihood ratio test statistics (i.e. the trace test and the maximum eigenvalue (λ-max). The trace test statistic is based on:

$$TR = T \sum_{i=r+1}^{N} \ln(1-\lambda_i) \tag{6}$$

where $\lambda r+1$, ..., λN are the N-r smallest squared canonical correlations between Xt-k and Δ Xt series, corrected for the effect of the lagged differences of the Xt. The maximum eigenvalue statistic is given by:

$$\lambda_{max} = T \ln(1-\lambda_{r+1}) \tag{7}$$

Given that the asymptotic distributions of the trace and maximum eigenvalue test statistics follow χ^2 distributions, a simulation procedure is needed to identify proper critical values for each test (see Osterwald-Lenum, 1993).

We next employ the Phillips and Hansen (1990) fully modified OLS (PH-FM OLS)

procedure to obtain the long run estimates for the seven topmost income groups in the United

States. The model specification for the PH-FM OLS procedure utilized by the study is as follows:

$$Y_t = \alpha_0 + \alpha_1 PTRADE_t + \alpha_2 INFL_t + \alpha_3 UEMP_t + \alpha_4 INT_t + \varepsilon_t \tag{8}$$

where Y represents the dependent variables [i.e. the seven topmost income shares
including SHARE1(99-100%), SHARE2(99.5-100%), SHARE3(99.9-100%), SHARE4(99-
99.5%), SHARE5(99.5-99.9%), SHARE6(99.9- 99.99%) and SHARE7(99.99-100%)]. PTRADE
is the extent of trade, INFL stands for inflation rate, UEMP represents unemployment rate, INT
represents real interest rate, and ε is the error term. All variables with the exception of the error
term (ε_t) are expressed in percentages. The extent of trade (i.e. PTRADE) is expected to have
positive impact on the various income shares (i.e. $\alpha_1 > 0$). On the other hand, inflation rate and
unemployment rate are expected to negatively influence the various income shares (i.e. $\alpha_2 < 0$
and $\alpha_3 < 0$). However, interest rate could have either positive or negative effect on the income
shares (i.e. $\alpha_4 > < 0$). The PH-FM OLS is preferred over the standard OLS and the other single
equation long run models including those espoused by Engle and Granger (1987) and Stock and
Watson (1993) because of its ability to mitigate the endogeneity in the data and asymptotic bias
in the estimated regression coefficients.

IV. DATA SOURCES AND EMPIRICAL RESULTS

This paper uses annual observations on four macroeconomic variables (i.e. the extent of
trade, inflation rate, real interest rate, and unemployment rate) and the seven topmost income
shares for the United States from 1961 to 1998. The inflation rate is computed as the annual
percentage increase in the consumer price index. The unemployment rate is computed as the

percentage unemployed relative to the labor force. We derive the real interest rate by subtracting inflation rate from the nominal interest rate. In this study interest rate refers to lending rate. All four variables are in percentage terms. The extent of trade is a measure of the extent of international trade. It is computed as the percentage of the sum of exports and imports to GDP. The data for the extent of trade, inflation rate, and real interest rate were obtained from the 2002 *CD-ROM of the World Bank*, *World Development Indicators*. The unemployment rate data were taken from the *Handbook of U.S. Labor Statistics.* The data for the seven topmost income shares for the United States were obtained from Piketty and Saez (2001).

The unit root test results obtained from both the ADF and PP procedures are presented in Table 1. The results show that the income shares, inflation rate, the extent of trade, real interest rate, and unemployment rate have unit roots in their levels. They are stationary at the 5 percent significance level after first differencing. In other words, the series have one order of integration [i.e. I(1)].

Having determined that the series have the same order of integration, we next implement the Johansen and Juselius cointegration procedures to determine the long run relationship between the income shares, inflation rate, real interest rate, the extent of trade, and unemployment rate. The cointegration results are presented in Panels A through D of Table 2. The results suggest that the income shares, inflation rate, real interest rate, the extent of trade and unemployment rate are cointegrated. In all of the cases, both the trace and eigenvalue (λ-$_{max}$) tests reject the null hypothesis of no cointegration (i.e. r = 0). Most importantly, the cointegration test results indicate that there are two cointegrating vectors in all of the cases. The existence of cointegration indicates that there is a long run equilibrium relationship between the time series in

the system. It also indicates the tendency of the series in the system to revert to the previous period's equilibrium level.

Before estimating the PH-FM OLS equations for the various income groups, we performed a number of diagnostic tests to ensure that they posses the attributes of good econometric models. The test statistics obtained from the autocorrelation, normality, functional form, and ARCH tests are statistically insignificant at the conventional levels (i.e. 5 and 10 percent levels). These results suggest that the statistical attributes of good models are satisfied in all of the cases.

The long run parameter estimates from the PH-FM OLS are presented in Table 3. Each column beyond the first column gives the results for a particular high-income group on the four macroeconomic variables. The first row provides the number for the regression while the second row identifies the high-income group being considered. The results support the hypothesis that macroeconomic variables have implications for the shares of the highest income groups. As can be seen in Table 3, the extent of trade, inflation rate, real interest rate, and rate of unemployment have significant effects on every one of the high-income shares. In all of the cases, the four macroeconomic variables are significant at the 5 percent level of significance or better.

The size of the coefficients in terms of their effect on shares is quite substantial. The size of the numbers on the coefficients of the three macroeconomic variables is of a substantial magnitude. For example, focusing on the very highest of the high income share groups in equation 7 and on, PTRADE, the extent of trade variable, an increase in the extent of trade (PTRADE) by one percentage point leads to an increase of a fourteen hundredth percentage point in the income share for this group. Given the signs and the magnitudes of the variables of Table

3, one would, in general, expect the various high-income groups to be pro-trade, anti-inflation, and anti-unemployment.

The overall results suggest that the potential macroeconomic policy mix that is likely to be favored by the highest income groups.   The four basic policy alternatives are contractionary monetary policy and contractionary fiscal policy, contractionary monetary policy and expansionary fiscal policy, expansionary monetary policy and contractionary fiscal policy, and expansionary monetary policy and expansionary fiscal policy. The regression results on the shares are consistent with the high-income groups preferring a combination of contractionary monetary policy and expansionary fiscal policy. Within the traditional IS-LM model, such a choice leads to high interest rates, low levels of inflation, and high levels of output and employment. This is precisely the right chord, exactly the right prescription, for increasing the shares of the highest income groups according to the regression results.

V. CONCLUSIONS AND POLICY IMPILICATIONS

This study attempts to profile both the interests and the extent of the interests of the highest income groups of American society using the PH-FM OLS procedure on newly published data on the income shares of the highest income groups. The study finds that all of the four macroeconomic variables (i.e. the extent of trade, the inflation rate, real interest rate, and the rate of unemployment) significantly affect the shares of the various high-income groups. The extent of trade is found to have a significantly positive effect on the income share of the highest income groups. However, the inflation rate and the unemployment rate are found to negatively influence the income share of the highest income groups. These results suggest that, at present, the highest income groups in American society will tend to favor policies that increase trade, maintain price

stability, and lower unemployment. It may be argued that the other income groups may also favor the same policies since their absolute income levels may also begin to rise as a result of improved performance of the economy.

However, their relative position will deteriorate over time and contribute to growing income disparity. Burtless (1999) contends that such disparities undermine a nations' sense of social cohesion and works against the ideals of   political and legal equality. Inequality has also been found to affect public health. All this calls for a more egalitarian distribution of incomes in the interest of maintaining social equity and stability. Thus the major policy implication of this study for the U.S. government is to pursue economic policies that reduce income inequality such as to reform tax policies towards the low-income families and strengthen other income maintenance programs such as the welfare programs, social security, unemployment compensation, and health-care services.

The analysis also considers the interest rate as an additional macroeconomic variable in explaining high-income shares. It finds that the real interest rate is positively related to the shares of the highest income groups. This means that, all other things being equal, the highest income groups will not be opposed to policies that lead to higher interest rates.

In Piketty and Saez's analysis of their high income share data (Piketty and Saez 2001), Piketty and Saez notice that capital is a much greater source of income for the highest income groups for the pre World War II era in the U.S. than in the post World War II era. In a future study, it would be quite useful to do the same regression analysis on the highest income groups for the pre World War II era to see if there is any difference in the interest profile of the highest income groups between the pre and post war years given the observed change in income source between the two periods. It would also be worthwhile to extend the same analysis on other

countries to see whether cultural differences matter in characterizing the interest profile of

highest income groups with regard to macroeconomic variables.

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TABLE 1

UNIT ROOT TEST RESULTS

Series	Augmented Dickey-Fuller		Phillips-Perron	
	Level	Difference	Level	Difference
INF	$T_\mu = -1.74$	$T_\mu = -5.96^{**}$	$Z(\alpha^*) = -1.90$	$Z(\alpha^*) = -4.31^{**}$
	$T_\tau = -1.75$	$T_\tau = -6.19^{**}$	$Z(t_{\alpha^*}) = -1.91$	$Z(t_{\alpha^*}) = -5.54^{**}$
INT	$T_\mu = -1.46$	$T_\mu = -4.65^{**}$	$Z(\alpha^*) = -1.50$	$Z(\alpha^*) = -6.26^{**}$
	$T_\tau = -2.22$	$T_\tau = -4.61^{**}$	$Z(t_{\alpha^*}) = -2.47$	$Z(t_{\alpha^*}) = -6.18^{**}$
PTRADE	$T_\mu = -0.81$	$T_\mu = -4.25^{**}$	$Z(\alpha^*) = -0.58$	$Z(\alpha^*) = -4.89^{**}$
	$T_\tau = -2.44$	$T_\tau = -4.17^{**}$	$Z(t_{\alpha^*}) = -2.19$	$Z(t_{\alpha^*}) = -4.80^{**}$
UNEMP	$T_\mu = -2.50$	$T_\mu = -4.69^{**}$	$Z(\alpha^*) = -2.11$	$Z(\alpha^*) = -4.82^{**}$
	$T_\tau = -2.41$	$T_\tau = -4.66^{**}$	$Z(t_{\alpha^*}) = -2.13$	$Z(t_{\alpha^*}) = -4.79^{**}$
SHARE1	$T_\mu = 1.14$	$T_\mu = -4.31^{**}$	$Z(\alpha^*) = 0.76$	$Z(\alpha^*) = -9.06^{**}$
	$T_\tau = -0.82$	$T_\tau = -4.86^{**}$	$Z(t_{\alpha^*}) = -1.54$	$Z(t_{\alpha^*}) = -9.81^{**}$
SHARE2	$T_\mu = 1.12$	$T_\mu = -4.24^{**}$	$Z(\alpha^*) = 0.71$	$Z(\alpha^*) = -9.26^{**}$
	$T_\tau = -0.86$	$T_\tau = -4.76^{**}$	$Z(t_{\alpha^*}) = -1.65$	$Z(t_{\alpha^*}) = -9.99^{**}$
SHARE3	$T_\mu = 1.02$	$T_\mu = -4.15^{**}$	$Z(\alpha^*) = 0.61$	$Z(\alpha^*) = -9.28^{**}$
	$T_\tau = -0.89$	$T_\tau = -4.57^{**}$	$Z(t_{\alpha^*}) = -1.78$	$Z(t_{\alpha^*}) = -9.89^{**}$
SHARE4	$T_\mu = 0.41$	$T_\mu = -4.95^{**}$	$Z(\alpha^*) = 0.39$	$Z(\alpha^*) = -6.47^{**}$
	$T_\tau = -0.91$	$T_\tau = -4.57^{**}$	$Z(t_{\alpha^*}) = -1.27$	$Z(t_{\alpha^*}) = -6.80^{**}$
SHARE5	$T_\mu = 1.07$	$T_\mu = -4.28^{**}$	$Z(\alpha^*) = 0.73$	$Z(\alpha^*) = -8.71^{**}$
	$T_\tau = -0.92$	$T_\tau = -4.94^{**}$	$Z(t_{\alpha^*}) = -1.44$	$Z(t_{\alpha^*}) = -9.55^{**}$
SHARE6	$T_\mu = 1.58$	$T_\mu = -4.14^{**}$	$Z(\alpha^*) = 0.78$	$Z(\alpha^*) = -9.09^{**}$
	$T_\tau = -0.96$	$T_\tau = -4.63^{**}$	$Z(t_{\alpha^*}) = -1.74$	$Z(t_{\alpha^*}) = -9.81^{**}$
SHARE7	$T_\mu = 0.80$	$T_\mu = -4.20^{**}$	$Z(\alpha^*) = 0.33$	$Z(\alpha^*) = -9.47^{**}$
	$T_\tau = -0.90$	$T_\tau = -4.56^{**}$	$Z(t_{\alpha^*}) = -1.92$	$Z(t_{\alpha^*}) = -9.95^{**}$

[**] indicates 5 percent significance level. T_μ and $Z(\alpha^*)$= without trend. T_τ and $Z(t_{\alpha^*})$ = with trend. The critical values at the 5% significance level are -2.89 and -3.45, for without trend and with trend, respectively.   The lag length (1) is determined by AIC.   INF = inflation rate, INT = real interest rate, PTRADE = trade variable [(Exports + Imports)/GDP], UNEMP = unemployment rate. SHARE1= 99-100% income share, SHARE2 = 99.5-100% income share, SHARE3 = 99.9-100% income share, SHARE4 = 99-99.5% income share, SHARE5 = 99.5-99.9% income share, SHARE6 = 99.9 - 99.99% income share, SHARE7 = 99.99-100% income share.

TABLE 2
MULTIVARIATE COINTEGRATION TEST RESULTS

Maximum Eigenvalue Test			Trace Test		
Null Hypothesis	Test Statistic	Critical Value	Null Hypothesis	Test Statistic	Critical Value
Panel A: Johansen Cointegration Test Results (SHARE1)					
r =0	60.84**	37.07	r=0	122.57**	
					82.23
r ≥1	33.35**	31.00	r≥1	61.73**	58.93
r ≥2	15.98	24.35	r≥2	28.38	39.33
r ≥3	7.11	18.33	r≥3	12.40	23.83
r ≥4	5.29	11.54	r≥4	5.29	11.54
Panel B: Johansen Cointegration Test Results (SHARE2)					
r =0	60.96**	37.07	r=0	121.60**	
					82.23
r ≥1	31.90**	31.00	r≥1	60.64**	58.93
r ≥2	16.10	24.35	r≥2	28.74	39.33
r ≥3	7.34	18.33	r≥3	12.63	23.83
r ≥4	5.30	11.54	r≥4	5.30	11.54
Panel C: Johansen Cointegration Test Results (SHARE3)					
r =0	48.60**	37.07	r=0	122.98**	
					82.23
r ≥1	33.44**	31.00	r≥1	74.38**	58.93
r ≥2	22.70	24.35	r≥2	40.94	39.33
r ≥3	14.55	18.33	r≥3	18.24	23.83
r ≥4	3.69	11.54	r≥4	3.69	11.54
Panel D: Johansen Cointegration Test Results (SHARE4)					
r =0	65.49**	37.07	r=0	144.98**	
					82.23
r ≥1	47.77**	31.00	r≥1	79.49**	58.93
r ≥2	17.36	24.35	r≥2	31.72	39.33
r ≥3	9.60	18.33	r≥3	14.36	23.83
r ≥4	4.76	11.54	r≥4	4.76	11.54
Panel E: Johansen Cointegration Test Results (SHARE5)					
r =0	58.06**	37.07	r=0	120.03**	
					82.23
r ≥1	34.34**	31.00	r≥1	61.97**	58.93
r ≥2	15.88	24.35	r≥2	27.63	39.33
r ≥3	6.54	18.33	r≥3	11.75	23.83
r ≥4	5.21	11.54	r≥4	5.21	11.54
Panel F: Johansen Cointegration Test Results (SHARE6)					
r =0	61.76**	37.07	r=0	121.49**	
					82.23
r ≥1	32.05**	31.00	r≥1	59.74**	58.93
r ≥2	16.10	24.35	r≥2	28.75	39.33
r ≥3	7.41	18.33	r≥3	12.64	23.83
r ≥4	5.23	11.54	r≥4	5.23	11.54
Panel G: Johansen Cointegration Test Results (SHARE7)					
r =0	40.15**	37.07	r=0	114.34**	
					82.23
r ≥1	35.30**	31.00	r≥1	74.89**	58.93
r ≥2	23.11	24.35	r≥2	38.88	39.33

	12.31	18.33	r≥3	15.78	23.83
r ≥3					
r ≥4	3.46	11.54	r≥4	3.46	11.54

** Indicates rejection of the null hypothesis at the 5% level of statistical significance. The critical values are obtained from the Microfit 4.0 program. SHARE1= 99-100% income share, SHARE2 = 99.5-100% income share, SHARE3 = 99.9-100% income share, SHARE4 = 99-99.5% income share, SHARE5 = 99.5-99.9% income share, SHARE6 = 99.9 - 99.99% income share, SHARE7 = 99.99-100% income share.

TABLE 3
LONG RUN PARAMETER ESTIMATES OF THE HIGHEST INCOME SHARES BASED ON THE PHILLIPS-HANSEN FULLY MODIFIED OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	SHARE1	SHARE2	SHARE3	SHARE4	SHARE5	SHARE6	SHARE7
C	9.390*** (16.49)	6.407*** (11.90)	2.735*** (6.55)	2.978*** (45.90)	3.673*** (23.07)	1.663*** (8.73)	1.072*** (4.58)
PTRADE	.448*** (13.11)	.390*** (12.07)	.256*** (10.16)	.058*** (14.96)	135*** (14.08)	.145*** (12.64)	.111*** (7.89)
INFL	-.506*** (-11.94)	-.439*** (-10.97)	-.284*** (-9.15)	-.067*** (-13.88)	-.155*** (-13.06)	-.154*** (-10.87)	-.130*** (-7.48)
UNEMP	-.566*** (-6.43)	-.484*** (-5.81)	-.319*** (-4.94)	-.081*** (-8.12)	-.165*** (-6.72)	-.164*** (-5.56)	-.155*** (-4.29)
INT	.253*** (4.01)	.254*** (4.25)	.215*** (4.65)	-.0035*** (-.48)	.038** (2.17)	.096*** (4.54)	.119*** (4.59)

*** and ** indicate 1 and 5 percent significance level, respectively. PTRADE = extent of trade [(exports + imports/GDP)], INFL = inflation rate, INT = real interest rate and UNEMP = unemployment rate. SHARE1= 99-100% income share, SHARE2 = 99.5-100% income share, SHARE3 = 99.9-100% income share, SHARE4 = 99-99.5% income share, SHARE5 = 99.5-99.9% income share, SHARE6 = 99.9 - 99.99% income share, SHARE7 = 99.99-100% income share. One lag for the non-parametric correction and Tukey weights window were used..