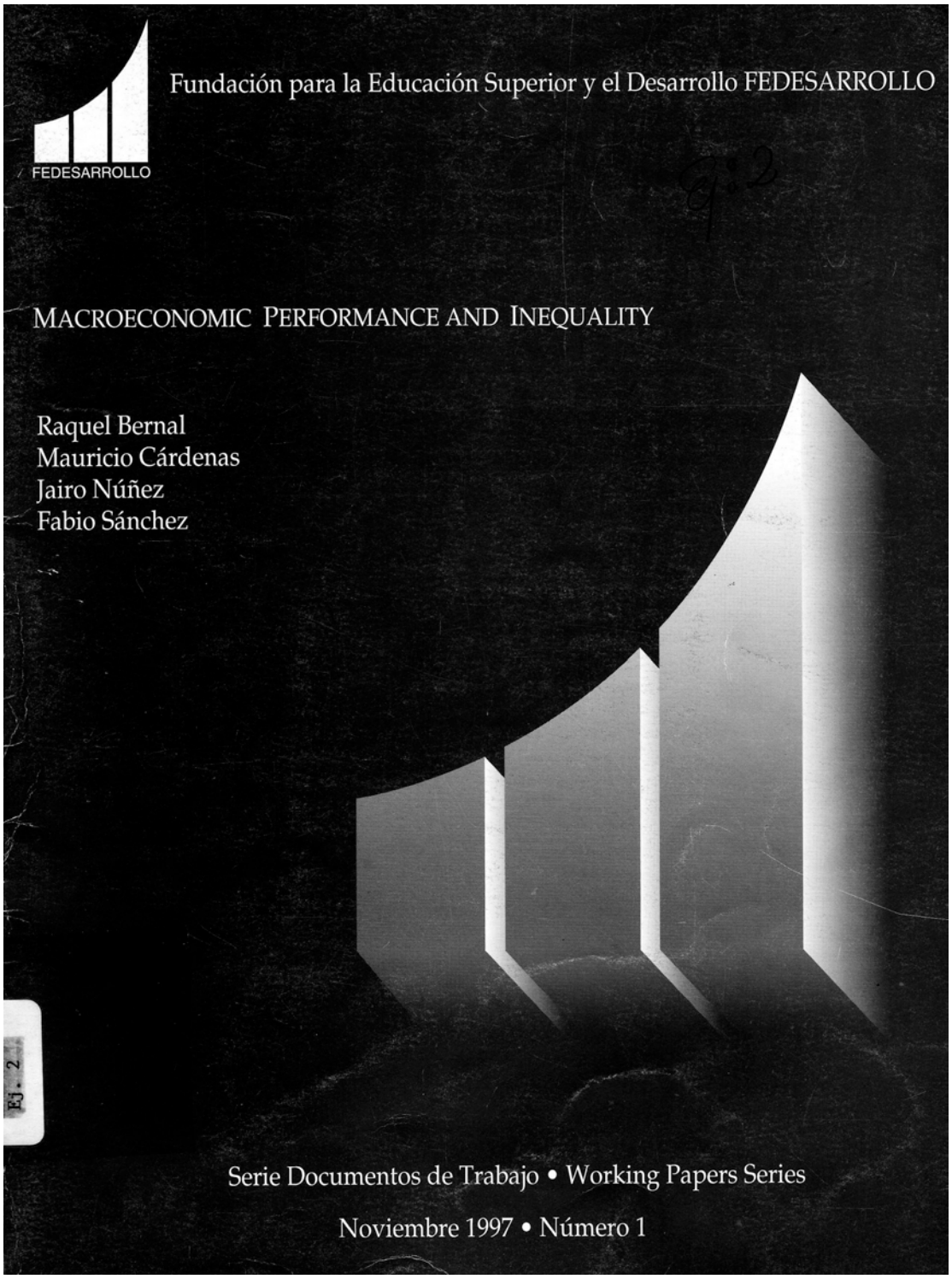

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MACROECONOMIC PERFORMANCE AND INEQUALITY

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Comments welcome

MACROECONOMIC PERFORMANCE AND INEQUALITY IN COLOMBIA: 1976-1996[1]

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ABSTRACT

This paper explores the relationship between macroeconomic conditions and urban income distribution in Colombia. The results show that unemployment and inflation have significant regressive effects. Manufacturing output growth is clearly progressive, as well as improved conditions in the rural areas. Currency overvaluation is also related to income concentration. In this sense, it is no surprise that the recent combination of high unemployment, an overvalued currency, and low overall economic growth have resulted in greater inequality. The paper also finds that unemployment and inflation have an adverse effect on education of the poor. Thus, macroeconomic instability is detrimental for the accumulation of human capital, which in turn has a long-term effect on the distribution of income.

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1. INTRODUCTION

This paper deals with the relationship between macroeconomic performance and equity. In line with a growing body of empirical literature, we analyze the impact of key macroeconomic variables on income distribution, as well as on the level and distribution of educational opportunities across the population. In particular, we explore the effects of economic growth, inflation, unemployment, and the degree of currency overvaluation, on several measures of income distribution. We perform similar exercises using enrollment rates (in primary, secondary, and tertiary education) as the dependent variables. The exercise is carried out both for the level of macroeconomic variables and their volatility.

The reasons why macroeconomic fluctuations are inefficient are well known. Economic theory has shown that it is optimal to smooth-out consumption across time when agents experience decreasing marginal utility. Also, macroeconomic instability results in greater uncertainty, which has a negative effect on investment. In fact, Fischer (1991) has pointed out that countries with greater macroeconomic stability experience, on average, higher economic growth. Thus, the allocation of resources is more efficient in less volatile economies.

Equity is also related to macroeconomic stability. It is often said that the poor are the chief sufferers of inflation, which is often characterized as the "cruelest tax" due to its regressive effects on income distribution. Also, the conventional wisdom views unemployment as having an inequality-augmenting effect. The argument here is that increases in unemployment have a larger impact on the earnings of the unskilled, who are the first ones to lose their jobs when aggregate employment falls. Although having intuitive appeal, the links between macroeconomic conditions and income distribution lack solid theoretical justification and have become the subject of a prolific empirical debate.

For example, using U.S. data, Blinder and Esaki (1978), and Blank and Blinder (1985) find that inflation *reduces* income concentration[3]. Nolan (1987) for the U.K. and Flückiger and Zarin-Nejadan (1994) for Switzerland also obtain the progressive impact of inflation. However, Blejer and Guerrero (1992) for the Philippines, and Björklund (1991) for Sweden, and Silber and Zilberfab (1994) for Israel have argued that the opposite is true. Moreover, the evidence presented by Cardoso, Paes de Barros and Urani (1995) for Brazil indicates that changes in inflation rates largely explain the sharp fluctuation of income distribution during the 1980s. In particular, they show that greater income concentration occurred during periods of higher inflation.

The effects of unemployment on income distribution are less controversial. Virtually every paper in this literature has pointed that higher rates of unemployment are associated with greater inequality. Indeed, building on previous work by Blinder and colleagues, Jäntti (1994) has argued that unemployment, not inflation, is the crueler tax in the U.S..[4] Evidence

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[3] Other references are Schultz (1969), Metcalf (1969), Beach (1977), Buse (1982), and Bishop, Formby and Sakano (1994).

[4] He estimates the same equations as in Blinder and Esaki (1978) using GLS rather than OLS and finds that inflation has progressive effects and that unemployment has diminishing regressive effects.

for developing countries also finds that increases in unemployment have a high social cost (see for example work by Bonelli and Ramos (1993) and Urani (1993) for Brazil.

Along a somewhat different vein, Urrutia and Cárdenas (1993) present some evidence of a strong correlation between economic fluctuations and the social cycle (i.e., deviations around trend for an array of social indicators) in four coffee producing nations (Colombia, Costa Rica, Cote d'Ivoire and Kenya). The overall, conclusion of this body of literature is that macroeconomic instability is not only inefficient, but also generates unpleasant effects on equity. This is especially true in developing countries, where inflation does seem to have an unambiguous regressive effect[5]. However, it is important to mention that the relationship between the effects of macroeconomic instability and income distribution goes the other way. In fact, it is likely that high-income concentration can cause macroeconomic instability (see Cuckierman, Edwards and Tabellini [1991]).

This paper explores these issues using a new database on income distribution available for Colombia. In particular, based on the Household Surveys[6] we constructed quarterly series on income distribution and educational attainment (by income quintiles) for the period 1976:1 to 1996:2. After processing and solving the top coding problems present in the data we obtained and array of income distribution indicators (e.g. Gini and Theil coefficients, top to bottom quintile ratio, etc.) for labor and non-labor income. These indicators were computed for labor earnings by individual and for the total household income in per capita terms, arguably a better measure of individual welfare.

Using cointegration analysis, this paper concludes that there is a long-run positive relation between inflation and income concentration. A similar result is obtained in the case of unemployment. In the terminology of Engle and Granger (1991) there is an attractor that holds these variables together in the long run. Trends in income inequality are related to trends in inflation and unemployment. Error correction models indicate that the same is true for the short run fluctuations in the variables.

Other macroeconomic variables are used in the paper. The results suggest that growth in the manufacturing sector is associated with a more egalitarian urban income distribution. Also, improved economic conditions in the rural sector (agriculture and mining) reduce inequality in the cities. The argument here hinges on the influence that rural sector conditions have on unskilled labor migration to the cities. Conversely, growth in nontradable sectors (e.g., construction and services) results in greater inequality. Lastly, a real depreciation of the currency is associated with improvements in income distribution.

The paper is divided in 5 sections. Section 2 describes the data and presents some stylized facts on income distribution and educational attainment in Colombia. Section 3 discusses some of the possible mechanisms that create a link between macroeconomic

[5] Recently, however, Ferreira and Litchfield (1997) using total household income per capita (rather than labor income) have found a negative correlation between unemployment an inequality for Brazil during the 1990s.

[6] These surveys collected data for the 4 largest metropolitan areas prior to 1982 and for 7 areas since then. The change in the sampling properties introduces some methodological problems that are dealt with later.

variables and social progress. Section 4 estimates a cointegrating vector that establishes a long-run relationship between income distribution and macroeconomic performance. Section 4 applies an identical procedure in order to capture the relationship between educational advancement and macroeconomic variables. Section 5 concludes.

2. DATA

2.1 INCOME DISTRIBUTION

This section presents the stylized facts on income distribution in Colombia, based on a new data set obtained from the Household Surveys. These surveys suffer from several methodological problems that had to be solved in order to construct our database. The main difficulties with the raw data are related to: i. Top-coding problems in reported incomes[7]; ii. Measurement errors on the part of the surveyors.

Top coding problems are present in most of the surveys. Until September 1993 the questionnaire allowed up to six digits for monthly incomes, so that higher end incomes were increasingly underestimated[8]. Since September 1993 seven digit incomes were allowed, but even then a fraction of the surveyed individuals reported the top coded income. This problem was finally solved in March 1996 (the surveys no longer have limits on the maximum income reported). In order to correct for truncated incomes in the survey we implemented a procedure, which is described in Appendix 1[9]. The procedure is relatively ad hoc, but has better statistical properties than alternative methodologies. In order to compare the results of available procedures we artificially impose top-codes on the incomes of an untruncated survey. If truncation problems are solved using a lognormal distribution the Gini coefficient is overestimated by 2.44%. In contrast, the degree of overestimation is only 0.07% when our procedure is used.

Measurement errors on the part of the surveyors refer to the fact that many workers report a weekly (or by-weekly) payment of their salary, but express their salary in monthly terms. We found that the monthly incomes of some workers had been overestimated due to the fact that a monthly salary had been (wrongly) multiplied by the frequency of payment. We dealt with this problem by identifying outliers in groups with similar socioeconomic characteristics.

Throughout the paper we use three definitions of income. All our income concepts are based on primary sources. Thus, we ignore the role of transfers and subsidies to households[10]. First, we use pre-tax labor earnings for the individual. Second, we use pre-

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[7] Cárdenas and Gutiérrez (1996) describe in detail the top-coding problems and survey the alternative solutions that have been proposed in the literature.

[8] At the 1993 exchange rate, the maximum allowed monthly income (Col$999.998) was equal to US$1,200.

[9] The procedure is based on the estimation of the maximum level of income for the individuals whose incomes are truncate. Once that level is estimated we then fit an exponential function to distribute the incomes of the truncated population.

[10] Cárdenas and Vélez (1996) show that these forms of secondary income have played a decisive role on income distribution in Colombia in recent years.

tax non-labor income (pensions, interest payments, dividends, and rents) where the receiver is also the individual. Third, we computed the gross monthly household income (from all sources). Our results are robust to the choice of income measure.

In order to describe the data we performed some static decompositions of inequality in Colombia. The goal is to separate total inequality into a component of inequality between some arbitrarily chosen groups, and the remaining within-group inequality. The individuals can be grouped according to age, gender, educational attainment, geographical location (e.g., urban vs. rural), ethnicity, etc. In the case of household income these partitions can be made according to the characteristics of the household head.

In order to perform these decompositions we use the Theil index, which is a particular case of the generalized entropy class of measures. The partition of the overall distribution by individual attribute was carried for level of education. In particular, we calculated:

$$T_T = \sum_{k=1}^{k} q_k \sum_{j=1}^{j} \frac{q_{j,k}}{q_k} \ln \frac{q_{j,k}/q_k}{p_{j,k}/p_k} + \sum_{k=1}^{k} q_k \ln \frac{q_k}{p_k} \qquad \textbf{(1)}$$

where q_k is group's k share in total income (groups were defined according to the years of schooling of the population)[11], $q_{j,k}$ is the share of individual j in group k, p_k is the share of group k in total population and $p_{j,k}$ is the share of individual j in group k. The first term on the right hand side is the Theil index within groups (T_W) and the second term is the Theil index between groups (T_B). The ratio $R_B = \frac{T_B}{T_T}$ measures the share of inequality that can be explained with the attribute that defines the groups' partition[12]. In our case, the within groups entropy index measures the part of inequality that cannot be explained with educational differences.

Figure 1 shows the total and within-groups Theil indexes for labor incomes. A cursory look at the graph suggests the presence of a rapid decline in inequality between 1976 and 1982, followed by stability during the 1980s. During the 1990s inequality has increased substantially. Interestingly enough, the partition by educational attainment of the population does not seem to explain much of total inequality. In fact, R_B lies between 28 and 34% for the period 1976-1996 so the between-group component is not substantial. This is of interest because it implies that a large share of inequality can be explained with macroeconomic variables[13].

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[11] The k groups correspond to: i. 0 years, ii. 1 to 5 years, iii. 6 to 10 years, iv. 11 years, v. 12 to 15 years and vi. 16 years.

[12] See Cowell and Jenkins (1995) for a formal derivation of all Generalized Entropy measures.

[13] This result is consistent with Núñez and Sánchez (1997) who find that approximately 28% of inequality can be explained by differences in educational attainment across the population.

Moreover, it is worth noticing that the reduction in inequality between 1976 and 1982 was mainly due to a reduction in inequality between groups, while the recent increase is the result of greater within-groups inequality. Thus, the role of macroeconomic factors is potentially larger in explaining changes in income distribution throughout the 1990s. This is of interest because it suggests that structural reforms cannot be held accountable for the higher skewness of the distributional curve. As we will argue, emphasis should rather be placed on greater macroeconomic instability in recent years.

To complete this description we use other measures of inequality, such as the Gini coefficient, and the share of income received by each quintile of the population. Figure 1 also shows the Gini coefficient for labor earnings by individual. According to the data, primary income is highly concentrated in Colombia. In fact, when comparing our measures with the evidence gathered in Deininger and Squire (1996) Colombia emerges as one of the countries with greater inequality in Latin America (already the region with greater inequality in the world). The trends are fairly close to those described before: The Gini coefficient experienced a drastic reduction from 0.49 in 1976 to 0.40 in 1982. Since 1991 it has increased to the levels observed in the late 1970s.

Figure 2 shows share of labor income by quintile, as well as the top-to-bottom quintile ratio[14]. These data confirm the mentioned trends: Until the early 1980s all the measures point towards a reduction in income concentration. This trend reversed during the late 1980s. According to the 1996 data, the top quintile received 54% of total income, while the bottom quintile received 6%. The 5:1 ratio indicates that the share of the top quintile is 9 times larger than that of the bottom quintile. In fact, the top quintile's share has increased steadily during the 1990s.

Figures 3 and 5 show the same variables calculated with non-labor income only. Clearly, in this case the concentration of income is much higher. In 1996, only 2.7% of non-labor income was received by the bottom decile, while 60% went to the top 20% of the population. Moreover, the Gini coefficient has increased from 0.56 in 1990 to 0.62 in 1996.

Lastly, Figures 4 and 5 depict income distribution variables based on the total household income in per capita terms[15]. Since the average size of low-income households is relatively larger, income distribution is more skewed according to these measures. The top to bottom quintile ratio was 14 in 1996 (10 in 1982), a figure that is likely one of the highest in the developing world. More worrisome is the trend observed since 1991. The top quintile's share rose from 54.7% in 1991 to 57.8% in 1996.

2.2 EDUCATION

As shown in the previous section, educational attainment is one of the attributes that can explain total inequality. But education itself is a variable attribute (such as

[14] This ratio has some advantages over the Gini coefficient. See Deininger and Squire (1996).

[15] The sum of total income (labor and non-labor) of the household divided by the number of individuals in the household.

income) that can respond to macroeconomic conditions. Hence, causation running from education to income distribution is misleading. It is probably more accurate to treat education and income distribution as endogenously and simultaneously determined by a common set of factors which include macroeconomic conditions.

This section describes the data on education gathered from the Household Surveys. Figure 6 shows gross enrollment rates in primary, secondary and tertiary education for the bottom and top quintiles of the population. A cursory look indicates that enrollment rates have increased significantly during the 1990s. This is true for primary and secondary education for the bottom quintile and for all levels of education for the top quintile. These trends are consistent with the rapid increase in public expenditure in education, which rose from 3.0% of GDP in 1990 to 3.7% in 1995[16].

Enrollment rates in secondary education show the fastest increase (48% in 1982 to 62% in 1996). This increase is more dramatic for the bottom quintile (from 35% in 1982 to 57% in 1996). Figure 7 shows the average years of schooling for the urban population calculated from the Household surveys. According to the data, the average educational attainment of the population rose from 7.5 to 9 years between 1982 and 1996. The lower part of Figure 7 displays the ratio in terms of years of schooling of the top and bottom quintiles. The data indicates that the educational gap has narrowed since 1982[17]. In the next section we deal with the relationship between these trends and macroeconomic performance.

3. Income Distribution and Macroeconomic Stability

As mentioned in the introduction, the time series regressions linking macroeconomic variables and income distribution data have a long tradition in the literature[18]. For example, in the case of the U.S., Schultz (1969), Metcalf (1972), Thurow (1970), Blinder and Esaki (1978) use income shares (by quintile), Gini coefficient and the Theil index as the dependent variable. Unemployment is always a significant explanatory variable, whereas the effects of inflation and the factorial distribution of income are less conclusive. Indeed, Blinder and Esaki (1978) find that increases in inflation rates are associated with a more egalitarian distribution. In contrast, Metcalf (1972) finds evidence suggesting the opposite effect. The difficulty with the time series approach is that other factors that affect income distribution are difficult to isolate.

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[16] According to the data in Londoño (1997).

[17] According to the 1993 National Census, 14% of the population over 5 years was illiterate. Nevertheless, when computing this rate again with population over 15 years, we obtain 3.5% of illiterate population. Based on the 1985 National Census the adult illiterate rate was approximately 11% while in countries with average income this rate was 25% and in Latin American countries it corresponded to 17%. In spite of this, we are yet far from developed countries' rates (approximately 5%). For a detailed analysis on illiteracy see World Bank (1991).

[18] There are other approaches, however. Budd and Whiteman (1978) and Minarik (1979) are examples of papers based on simulation exercises. In the latter case, higher inflation reduces the value of long-term assets and implies a form of redistribution from creditors to debtors.

This body of literature has identified several transmission mechanisms from macroeconomic stability to income distribution[19]. Economic activity can have different effects on income distribution depending on the impact on the composition of output and on the compensation of the different factors of production. The conventional wisdom argues that labor market deterioration (maybe due to its depressing effects on wages) affects low income groups more adversely than high income groups. This could also result from greater flexibility in the unskilled labor market (due, for instance, to differences in the labor legislation). Although imprecise about the specific mechanism, the literature agrees that unemployment adversely affects the lower end of the income distribution.

Although the evidence for developed countries is mixed, inflation does seem to be a regressive distributive device in developing countries. Neri (1995) discusses several channels though which inflation can result in greater inequality: (i) economies of scale in financial transactions; (ii) limited access (by the poor) to indexed financial assets; (iii) higher degree of wage indexation for skilled workers (in other words, the degree of indexation increases with the level of skill); (iv) lower share of durable goods in the consumption basket of the poor. Of course, these channels are less relevant in the case of high-income and low inflation countries. Thus, the fact that inflation has a statistically significant progressive effect on the distribution of income in the U.S. and the U.K. may be due to the fact that in those economies (unexpected) inflation proxies for an increase in aggregate demand. At any rate, it is hard to identify *a priori* the effects of inflation on equity. Dealing with this issue becomes an empirical question.

Lastly, Demery and Addison (1987) have analyzed the effect of the real exchange rate on income distribution. According to their results, the effect depends on price and wage flexibility, and the relative weight of traded and nontraded production for the different groups of the population.

Following that line of research, this paper estimates the following equation:

$$S_t = \alpha + \beta u_t + \gamma \pi_t + \delta e_t + \sum_i \rho_i g_{it} + \varepsilon_t \qquad (2)$$

where S_t is a measure of income distribution (e.g., top-to-bottom quintile ratio, Gini coefficient, and the within groups Theil index), u_t is the unemployment rate, π_t is the inflation rate, e_t is the real exchange rate y g_{it} is the growth rate in sector i. Alternative versions of the model included a quadratic term on unemployment, and lags on the dependent and explanatory variables. Also, the equation can be estimated with the volatility of unemployment and inflation (measured by a rolling standard deviation) and the business cycle (measured by the deviations in output around a Hodrick-Prescott trend), instead of the macroeconomic variables in levels. The source for all the explanatory variables is DANE, except the GDP quarterly series, which come from DNP and the multilateral real exchange rate, which is obtained from the Banco de la República.

[19] See Nolan (1989), Bjorklund (1991), Blejer and Guerrero (1992).

The results of estimating equation (2) are of interest. It is well known that the usual techniques of regression analysis can result in highly misleading conclusions when variables contain stochastic trends (Granger and Newbold [1974]). In particular, if the dependent variable and at least one independent variable contain stochastic trends, and if they are not cointegrated, the regression results are spurious. To identify the correct specification of the model depicted by equation (2) it is necessary to analyze the presence of stochastic trends in the variables. To this end, augmented Dickey-Fuller tests were performed on all the variables of the model (see Table A1 for the results). The statistic τ_β corresponds to the model with intercept and trend, the statistic τ_μ to the model that contains only an intercept and, finally, the statistic τ indicates the model was estimated without both intercept and trend. The values tabulated by McKinnon (1991) are used given that the estimated coefficients do not have the usual asymptotic distribution. As shown in Table A1, the null hypothesis of the existence of a unit root cannot be rejected for any of the variables[20].

Additionally we used the Hylleberg-Engle-Granger-Yoo (HEGY) test for quarterly data in order to test for seasonal unit roots. The results are reported in Table A2 and indicate that almost all the variables show a unit root at zero frequency (π_1), but not in the half yearly frequency (π_2) nor the annual frequency (π_3 y π_4). Only primary enrollment rates show a unit root in the half yearly frequency[21].

Given that all variables in equation (2) are I(1) we used the Johansen cointegration test[22]. In order to capture the long and short run relationships between the variables we also estimated the corresponding vector error correction model (VEC). These techniques diminish the risks of obtaining spurious results, which are likely to be pervasive in the previous literature.

Table A3 shows the results of the cointegration test using the income distribution variables[23]. They indicate that all groups of variables are cointegrated, which implies that a long run relationship between the variables holds. Three of the systems shown have two cointegrating vectors, while the last system has three vectors at the 5% confidence. Table 1 shows the cointegrating vector (normalized for the income distribution variable) that corresponds to the theoretically expected results.

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[20] Appendix 3 presents Perron's test for unit root in the presence of structural changes for some of the variables, nevertheless, as magnitudes of these changes are pretty small, only Dickey-Fuller and HEGY tests were used to decide about the stationarity of variables.

[21] For this reason, these variables were de-seasonalized using the X11 procedure.

[22] There are three main reasons for this choice: First, Gonzalo (1994) shows that the Johansen test performs better than other approaches under various specifications errors. Second, Johansen's approach is able to incorporate cointegration into the familiar VAR representation without restrictions on the exogeneity of the variables. Third, the procedure provides simultaneously test statistics to infer the number of cointegrating relationships and estimates of the cointegration vectors.

[23] All systems used in this exercise include a dummy variable that equals 1 in the second quarter of 1982, due to the fact that the sample was changed from 4 to 7 metropolitan areas, and in each city the number of interviewed individuals increased from 10.000 to approximately 30.000.

According to the results presented in Table 1, the unemployment rate has a regressive and significant effect on income distribution. Higher rates of unemployment are associated with increases in the top-to-bottom quintile ratio (as well as in the Gini coefficient) computed either with labor income or with the total household income in per capita terms. This result implies that unemployment causes a significant social cost, probably due to the fact that unskilled workers are more likely to loose their jobs once a drop in employment starts. The error correction model results (not shown) indicate that all income distribution variables used significantly respond to past deviations from the long run equilibrium of the variables in the system. Nevertheless, these temporary deviations take a long time to be corrected. The coefficient indicates that, on average for the entire sample, only 8% of the short run disequilibrium between the income distribution variable and the other variables included in the system is corrected within one quarter.

Figures 8 and 9 show the impulse-response exercise for the systems in Table 1 using total household income per capita. These graphs are based on the error correction model where the short run dynamics between the variables of the system are influenced by the long run deviation from equilibrium. We show the response of the top to bottom quintile ratio and Gini coefficient to a one standard deviation in each of the macroeconomic variables. As can be seen, a one standard deviation shock in the unemployment rate causes an increase in income concentration, indicating that unemployment has a regressive impact on the distribution of income. Moreover, the effect tends to be of permanent nature.

On the other hand, the results in Table 1 indicate that inflation has a regressive and significant effect on the distribution of income. Higher inflation rates lead to increasing levels of inequality, as measured by the top-to-bottom quintile ratio and the Gini coefficient (computed with labor earnings and total household income per capita). The impulse-response analysis indicates that a one standard deviation shock in the inflation rate increases the top-to-bottom quintile ratio (based on total household income per capita). In the case of the Gini coefficient based on total household income the effect is positive but practically zero after two years (see Figure 9)[24]. In sum, the evidence suggests that the inflation tax is regressive in Colombia, possibly due to the fact that the earnings of the poor are less indexed than for other income groups. Also, groups at the higher end of the income distribution scale can protect themselves against inflation acquiring real assets, a possibility that is less feasible for the poor.

From the results reported in Table 1 it can also be inferred that once we control by the unemployment rate, the growth in manufacturing has a significant progressive effect. This result can be attributed to the intensive use of unskilled labor in the manufacturing sector. In fact, according to the Annual Manufacturing Survey conducted by DANE, the share of unskilled labor in total manufacturing employment was 75% in 1976 and 65% in

[24] It is important to remember that an increase in the Gini coefficient is not relation exclusively to transfers from the bottom to top quintiles. In fact, this can also happen if transfers from the second to fourth quintile, or third to fourth quintile take place.

1994. Moreover, the manufacturing sector represented approximately 23 to 30% of the urban GDP between 1976 and 1996.

After analyzing the impulse-response exercise shown in Figures 8 and 9 we can see the a standard deviation shock in the growth in manufacturing causes a reduction in the measures of income concentration. The effect is progressive during the first 4 quarters after the shock but practically zero thereafter.

Additionally, the cointegration exercise allows us to infer that growth in agriculture and mining has a significantly progressive effect. Interestingly, this result suggests that favorable conditions in the rural sector reduce unskilled migration to the cities, thus reducing the possibility of significant urban income concentration. The short run analysis presented in the impulse-response exercises clearly shows that a standard deviation shock in the growth in agriculture and mining permanently reduces all measures of income concentration.

In contrast, after controlling for the effect of unemployment, growth in urban non-tradable activities raises income concentration. In fact, the estimated coefficient indicates that an increase in the growth in nontradables raises the top-to-bottom quintile ratio and the Gini coefficient. This result is difficult to interpret, but could be suggestive of a higher degree of capital and skilled labor intensity in those sectors. The impulse-response analysis shows that one standard deviation increase in the growth in nontradable sectors is associated with an increase of all income concentration measures.

Finally, the results presented in Table 1 indicate a clearly progressive effect of a real depreciation of the currency[25]. This result can be due to the fact that a considerable proportion of Colombian exports is intensive in unskilled labor. Thus, the loss induced by the increase in the price of tradable goods is less than the gain due to the increase in real earnings. The impulse-response analysis indicates a negative (progressive) impact of a standard deviation shock in the real exchange rate. Nevertheless, this effect is small in terms of magnitudes. In fact, for the case of the top to bottom quintile ratio and Gini coefficient computed with total household income, the effect of a shock in the real exchange rates is nearly zero after a year from the initial impact.

Table 2 estimates the same cointegrating equation using the income share by each quintil as a measure of income concentration. The results are of interest because they suggest that, in relation to macroeconomic performance, the behavior of the share of the top quintile is remarkable different than for the remaining quintiles. In fact, inflation and unemployment increase the income share of the top quintile, while the opposite happens to the share of the remaining 80% of the population.

Table A3 also shows a similar cointegration exercise that includes growth separated in two components: the part of growth due to the increase in employment and the part of growth due to changes in multifactorial productivity. For that purpose we

[25] This result coincides with Blejer and Guerrero (1992) for the Philippine case.

calculated the quarterly Solow residual[26] for urban output, based on GDP data from the National Planning Department (DNP), employment data from the National Household Survey and a quarterly capital stock based on the investment information estimated by the DNP. According to the calculation, total factor productivity has increased significantly since 1992.

The results shown in Table 3 indicate that growth in urban employment reduces the degree of income concentration. However, growth in multifactorial productivity has the opposite effect on income distribution. This is an uncomfortable result, suggesting that gains in efficiency are not immediately transferred to the poor. Increases in productivity in our basic calculation can be derived from improvements in education, technology or infrastructure. Thus, the result is not surprising if the individuals at the higher end of the distribution of income are also the ones with greater access to those assets.

4. Human Capital and Macroeconomic Stability

In this section, we estimate equation (2) but use measures of educational attainment rather (than income distribution) in the left-hand-side. Specifically we use enrollment rates in primary, secondary, and university education as the dependent variables. The main objective is to assess the impact of macroeconomic performance on education. We look at the effects of macroeconomic variables on the educational attainment of the different quintiles of the population. We argue that macro conditions have an effect on the distribution of human capital, which as we saw is significant determinant of income distribution. Thus, the effect of macroeconomic fluctuations on equity goes beyond their direct impact on income. Macroeconomic conditions also have an impact on the distribution of assets.

Table A4 shows the Johansen cointegration test for each of the systems that include enrollment rates and the above-mentioned macroeconomic variables. In all cases, the existence of two cointegrating vectors at 5% confidence is found, except for university coverage in the top quintile, which exhibits only one cointegrating vector. These results suggest the presence of a long run relationship between educational attainment and macroeconomic performance in Colombia. Although not reported, the same results are obtained when enrollment rates for the entire population in the Household surveys are used.

Table 4 presents the normalized cointegrating vectors. Unemployment has a negative (and in most cases significant) effect on the enrollment rates for all levels of education, except university in the top quintile. This can be linked to the fact that deteriorating conditions in the labor market motivate adult participants of the labor market to retire temporarily, finding in university an alternative activity.

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[26] Using a Cobb-Douglas technology. The parameters of the production function were estimated econometrically. The share of employment in total product is approximately 0.6 and the share of capital is 0.4.

The results also indicate that higher inflation is related to a reduction in enrollment rates for all levels of education. This is true both for the bottom and top quintiles of the population. However, when the exercise is carried out for the entire population the effect is only significant in the case of enrollment rates in university education. Manufacturing output growth (a proxi of urban economic conditions) raises enrollment rates in primary and secondary education, but diminishes enrollment at the university level. Improved economic conditions seem to attract individuals into the labor force and out of university.

The effects of the real exchange rate on education are somewhat puzzling. A more depreciated currency seems to have a negative impact on enrollment in primary and secondary education, and a positive effect on university enrollment rates.

Finally, and as expected, the average years of schooling in the corresponding quintile are positively (and significantly) related to the enrollment rates. This result clearly confirms the existence of a virtuous cycle between education of a group and the motivation to create more education within it[27]. The educational attainment of the household head is a good predictor of the enrollment rates in all educational categories.

Figure 10 depicts the results of the impulse-response exercise using enrollment rates for the entire population as the variable of interest[28]. A one-standard deviation increase in the unemployment rate has a negative effect on primary and secondary education enrollment rates. The graphs also show that positive shocks to inflation are detrimental from the point of view of enrollment in primary education. It is important to mention that according to the error correction model (not shown) all enrollment rates respond significantly to past deviations from the long run equilibrium between the variables of the system. In fact, any temporary deviation takes a short time in being corrected: between 80 and 90% of the short run discrepancy is corrected within a quarter.

5. CONCLUSIONS

Colombia stands out as one of the countries with greater inequality in Latin America. Moreover, throughout the 1990s the country has experienced a significant increase in income concentration. The standard explanation links these trends to the effects of structural reform, especially trade liberalization. This paper adopts an alternative approach and explores the relationship between macroeconomic conditions and urban income distribution in Colombia. This is of interest because variables that explain differences in income between groups, such as education, cannot account for recent changes in inequality. In fact, a standard decomposition exercise indicates that increased income concentration is largely due to grater within-group inequality.

The results show that unemployment and inflation have significant regressive effects on the distribution of income. After controlling for these variables, economic

[27] These results coincide with the conclusions in Sánchez and Núñez (1996).

[28] Impulse-response functions for secondary and university enrollment rates are available upon request.

growth seems to have disparate effect on equity. Manufacturing output growth is clearly progressive, possibly due to its effect on unskilled employment. Improved conditions in the rural areas (measured by growth in agriculture and mining) deter unskilled labor migration to urban areas, reducing income concentration in the cities. A more depreciated currency also seems to have a progressive effect, due to the intensive use of unskilled labor in Colombian exports. Growth in nontraded goods production has an adverse effect from the point of view of income distribution. In this sense, it is no surprise that the recent combination of high unemployment, a strong currency, and low growth in agriculture and manufacturing have resulted in greater inequality.

The paper also finds that unemployment and inflation have an adverse effect on education of the poor. Thus, macroeconomic instability is detrimental for the accumulation of human capital, which in turn has a long-term effect on the distribution of income.

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APPENDIX 1
HOUSEHOLD SURVEYS: METHODOLOGICAL ISSUES[29]

Top-coding problems were registered between September 1982 and December 1995 (stages 36 through 90), when limits on the maximum reported monthly income where imposed (6 digits until June 1993 and 7 digits between September 1993 and December 1995). We corrected this problem by estimating the maximum income for the truncated surveys for each occupational category (employee, employer, and self-employed). Figure A1 shows the employers' income (in logs) for the surveys of September 1983 (top, truncated) and September 1982 (bottom, untruncated). In the top curve, the incomes' of X individuals were truncated.

In order to estimate the maximum income for this group, we calculated the average annual growth rate in the incomes of a group of high-income individuals of identical size as X, but whose incomes had not been truncated. We applied this growth rate to the maximum income reported in the untruncated survey. This gives point P in the

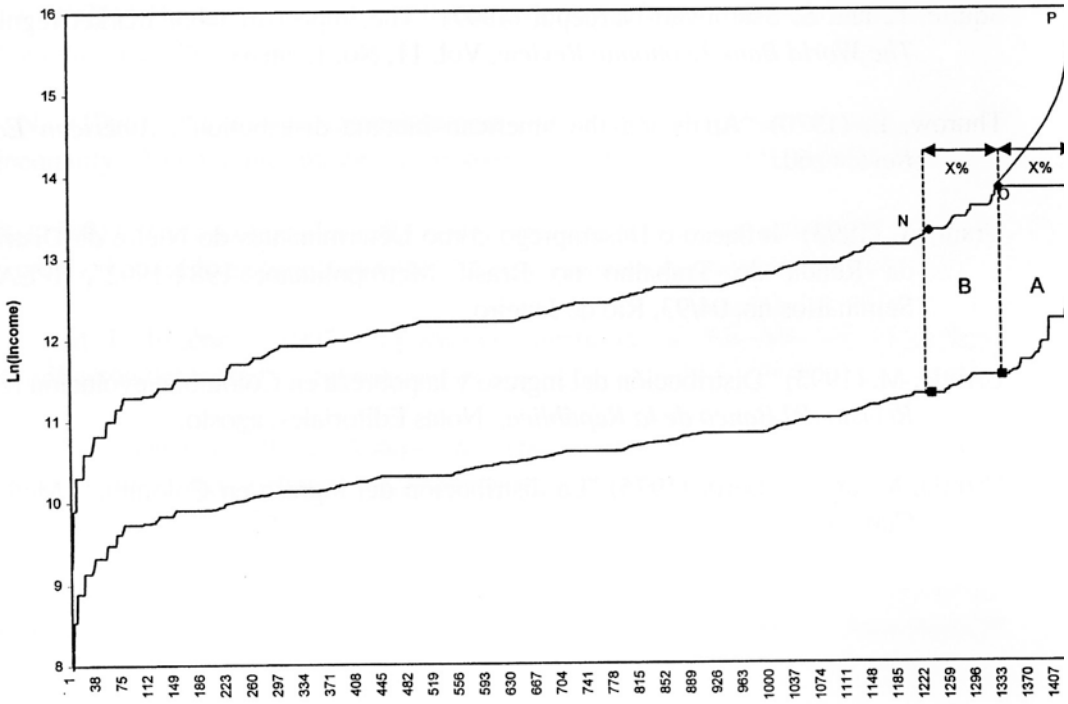


Figure.

Figure A1

Once that maximum income (P) was calculated we fitted an exponential function between points O and P. The estimated income of the X (truncated) individuals are given by:

[29] We would like Jaime Alberto Jiménez for his assistance in the elaboration of this Appendix.

$$Y_i = e^{\alpha n_i - \beta} + vc + \chi n_i \qquad (A1)$$

where $\beta = \alpha n - \ln(vm - vc - \chi n)$, α and χ are parameters of the exponential function, vc is the truncation value (Col$999,998 between stages 37 and 80, and Col$9'999,998 between stages 81 and 90), vm is the maximum (estimated) income in the truncated survey, and n is the number of individuals with truncated incomes. In order to obtain the parameters of the exponential function we estimated equation A1, with vc equal to income at point N, vm is income at point O (truncation value), and let α iterate between 0 and 4 and χ between 0 and 200,000. We chose the parameters that minimized the errors of the fit *vis à vis* the original data.

In Figure A1 we compare our results with those obtained with a lognormal distribution. For that purpose we artificially truncate an untruncated survey. The lognormal distribution overestimates the average income by 9.5% and the Gini coefficient by 2.44%. Our methodology overestimated income by 0.9% and the Gini coefficient by 0.07% only.

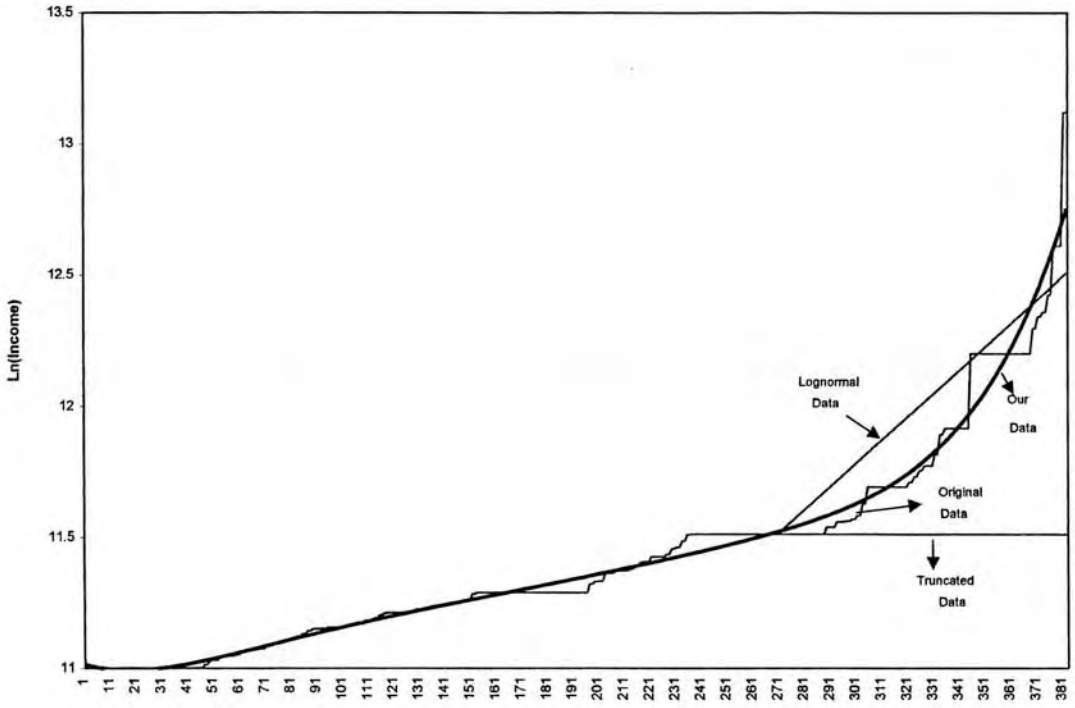


Figure A2

Table 1

COINTEGRATION VECTOR Income distribution measures				
	Labor income by individual		*Household income per capita*	
Cointegration Eq.	top to bottom quintile ratio	Gini	top to bottom quintile ratio	Gini
Unemployment rate	0.8845	1.2167	1.3657	0.8578
	(2.47)	(2.39)	(4.71)	(3.07)
Inflation rate	0.1804	0.2869	0.2211	0.2281
	(2.33)	(2.26)	(2.05)	(3.03)
Growth in manufacturing	-0.1277	-0.3129	-0.2351	-0.2227
	(-1.63)	(-2.50)	(-2.65)	(-2.87)
Growth in agriculture and mining	-0.3545	-0.4568	-0.6658	-0.3884
	(-2.92)	(-3.43)	(-4.74)	(-4.35)
Growth in non tradable sectors	0.9417	1.4999	1.3342	1.1495
	(3.65)	(4.85)	(6.48)	(6.47)
Real exchange rate	-0.0253	-0.0157	-0.0237	-0.0326
	(-2.80)	(-0.76)	(-1.86)	(-2.84)
Constant	0.0372	0.2112		0.3339

Table 2

COINTEGRATION VECTOR ***Income distribution measures***					
	Household income per capita				
Cointegration Eq.	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintil
Unemployment rate	-0.0787	-0.0857	-0.1010	-0.1373	0.3
	(-1.93)	(-1.71)	(-1.81)	(-2.17)	(1.
Inflation rate	-0.0452	-0.0640	-0.0749	-0.0878	0.2
	(-3.20)	(-3.61)	(-4.06)	(-4.06)	(3.
Growth in manufacturing	0.03173	0.0274	0.0045	0.0028	-0.0
	(2.27)	(1.69)	(0.31)	(0.17)	(-0.
Growth in non tradable sectors	-0.1111	-0.1658	-0.2011	-0.2432	0.7
	(-5.44)	(-6.10)	(-6.89)	(-7.37)	(7.
Real exchange rate	0.0822	0.0850	0.0979	0.0104	-0.0
	(3.74)	(3.42)	(3.46)	(3.38)	(-3.
Constant	0.0602	0.1062	0.1529	0.2293	0.4

Table 3

COINTEGRATION VECTOR		
Cointegration Eq.	Gini I.	Gini II.
Growth in urban employment	-0.3096	-0.3114
	(-1.66)	(-3.18)
Inflation rate	0.3087	0.1688
	(1.99)	(2.16)
Growth in multifactorial productivity	5.0914	2.2615
	(3.68)	(4.73)
Real exchange rate	-0.0930	-0.0730
	(-2.69)	(-4.21)
Constant	0.4558	0.5247

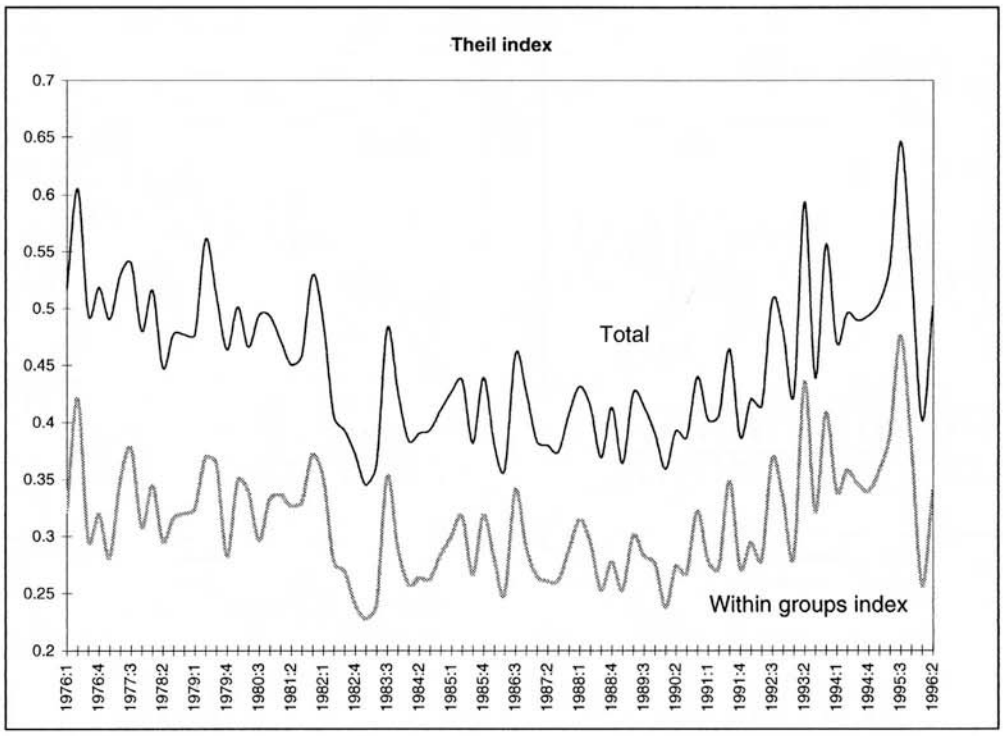
Table 4

COINTEGRATION VECTOR Education Measures						
	Bottom quintile			*Top quintile*		
Cointegration Eq.	Primary	Secondary	University	Primary	Secondary	University
Unemployment rate	-0.367	-0.922	-0.147	-0.117	-0.237	0.0170
	(-7.60)	(-4.41)	(-1.01)	(-0.93)	(-2.03)	(0.11)
Inflation rate	-0.073	0.0137	-0.175	-0.3780	-0.135	-0.21
	(-3.55)	(0.15)	(-2.28)	(-8.08)	(-2.32)	(-5.91)
Growth in manufacturing	0.0355	0.1272	-0.4189	-0.1088	0.1419	-0.142
	(1.42)	(1.10)	(-4.28)	(-1.66)	(2.33)	(-2.76)
Real exchange rate	-0.033	-0.012	0.1244	-0.045	-0.0328	-0.0493
	(-3.78)	(-0.32)	(4.02)	(-2.27)	(-1.76)	(-3.11)
Quintile's schooling rate	0.2519	0.5592	0.1319	0.4398	1.4900	0.5016
	(14.02)	(6.98)	(2.17)	(6.12)	(8.46)	(8.47)
Constant	0.6421	-0.358	0.1608	0.1737	-2.652	0.6052

	Total		
	primary	secondary	university
Unemployment rate	-0.5230	-1.9819	0.2990
	(-2.66)	(-6.91)	(2.54)
Inflation rate	-0.039	-0.1592	-0.158
	(-0.62)	(-1.24)	(-4.37)
Growth in manufacturing	0.2437	0.4028	-0.394
	(2.51)	(1.95)	(-5.71)
Real exchange rate	-0.113	0.0408	0.0433
	(-3.49)	(0.75)	(2.27)
Schooling rate	0.3321	0.2787	0.2002
	(4.42)	(2.58)	(3.88)
Constant	0.7766		0.4115

Figure 1

LABOR INCOME DISTRIBUTION MEASURES



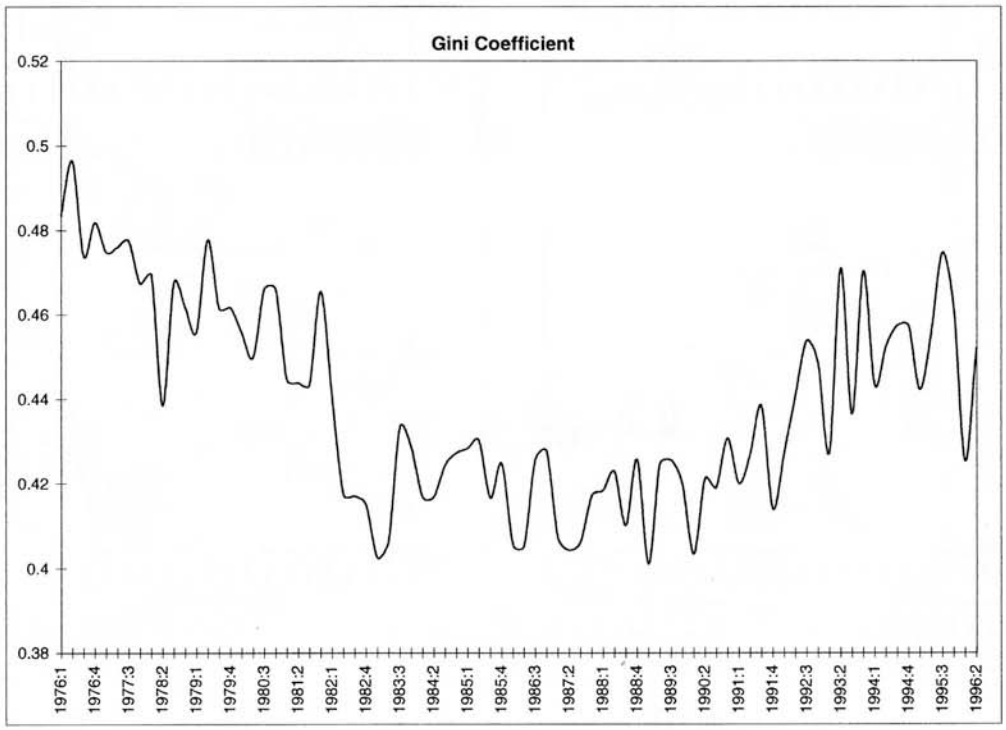


Figure 2

LABOR INCOME DISTRIBUTION
SHARES BY QUINTILE

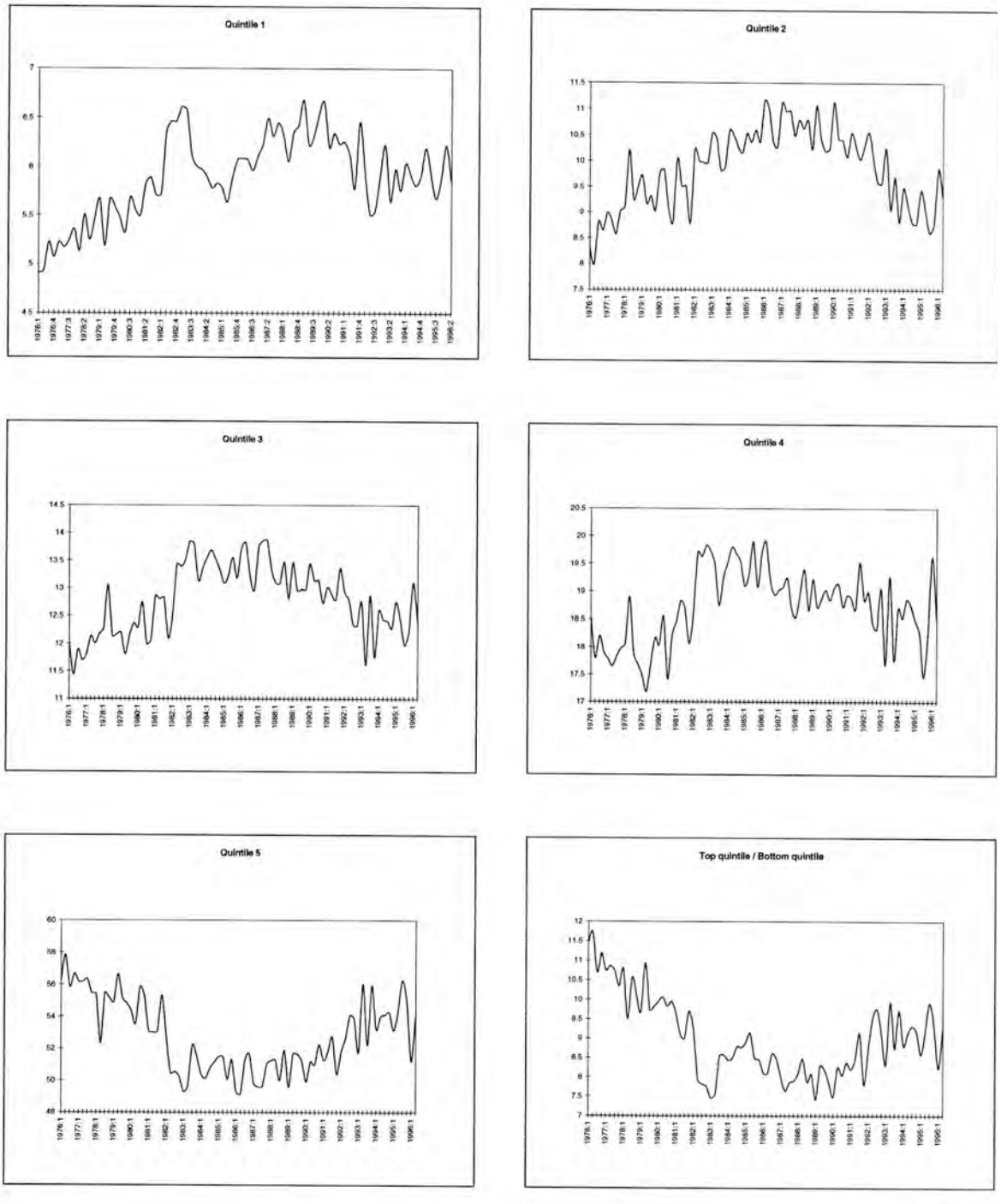


Figure 3

NON-LABOR INCOME DISTRIBUTION
SHARES BY QUINTILE

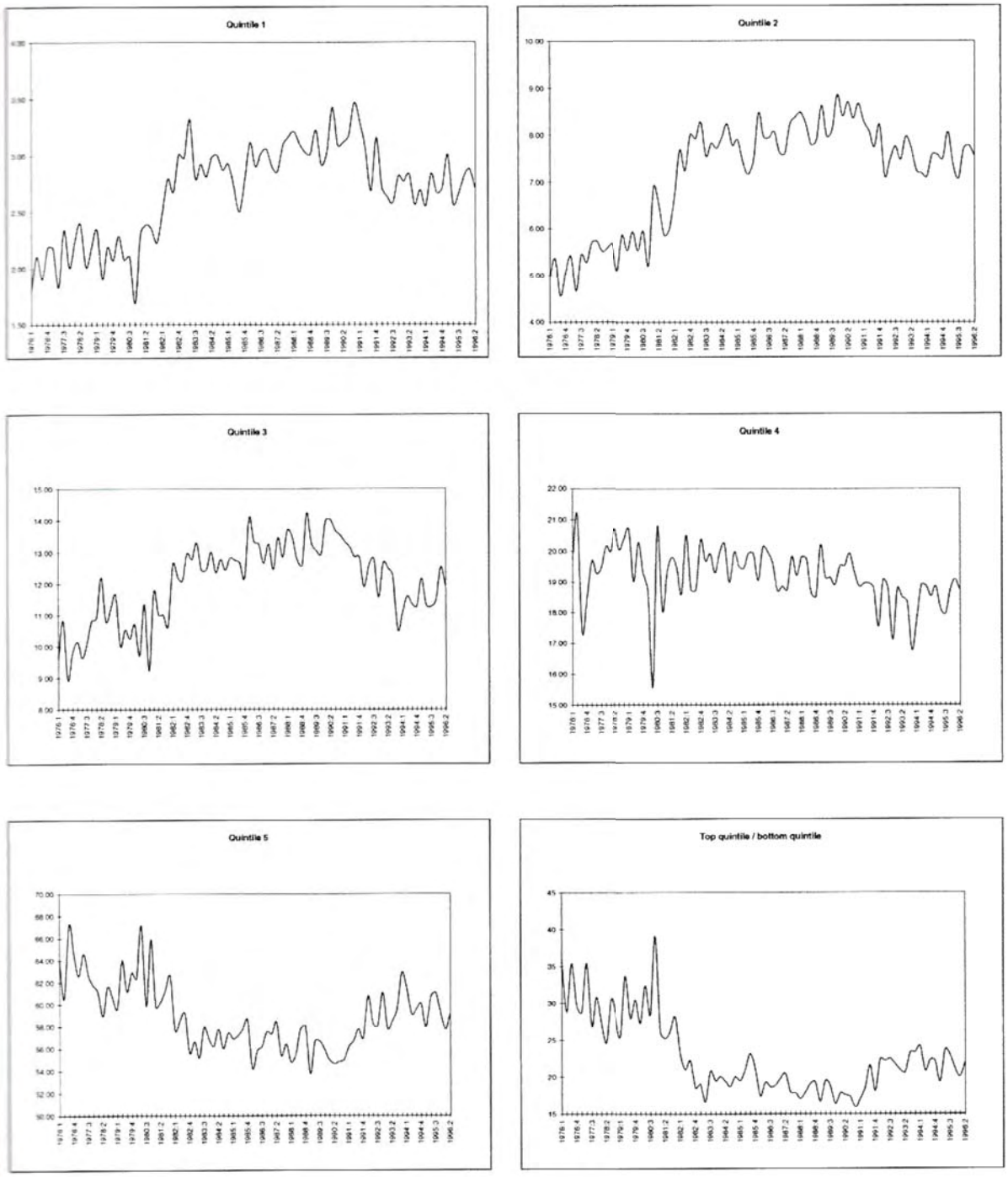
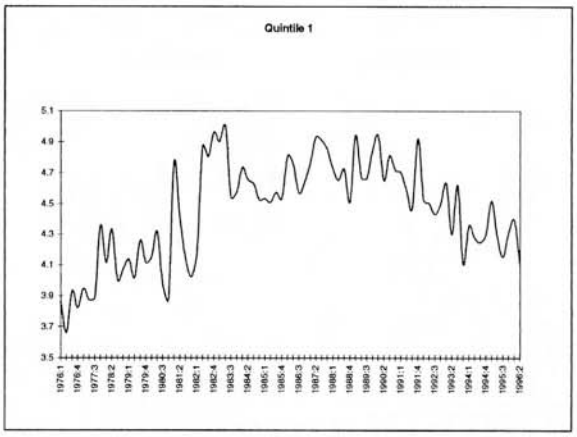
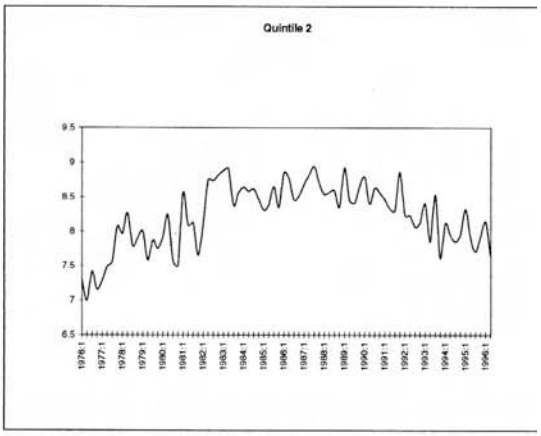
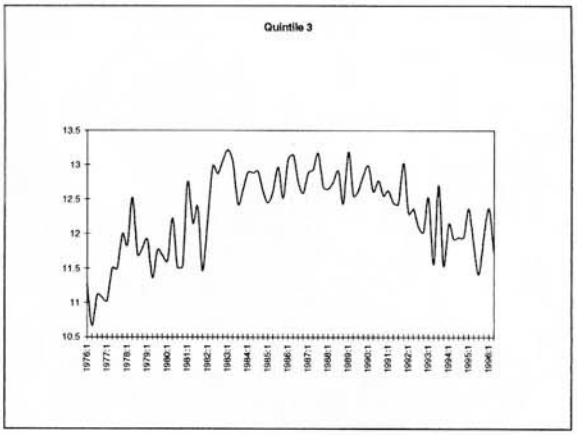


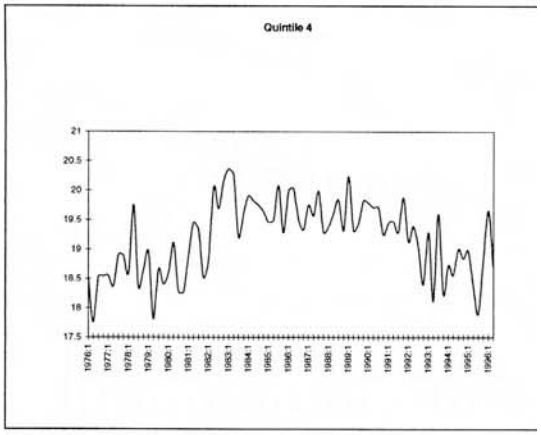
Figure 4

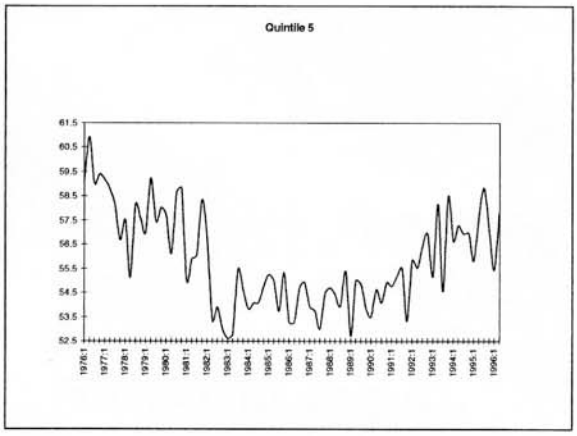
TOTAL HOUSEHOLD INCOME PER CAPITA











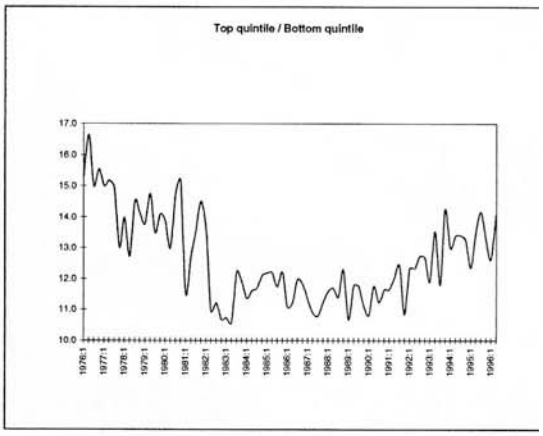
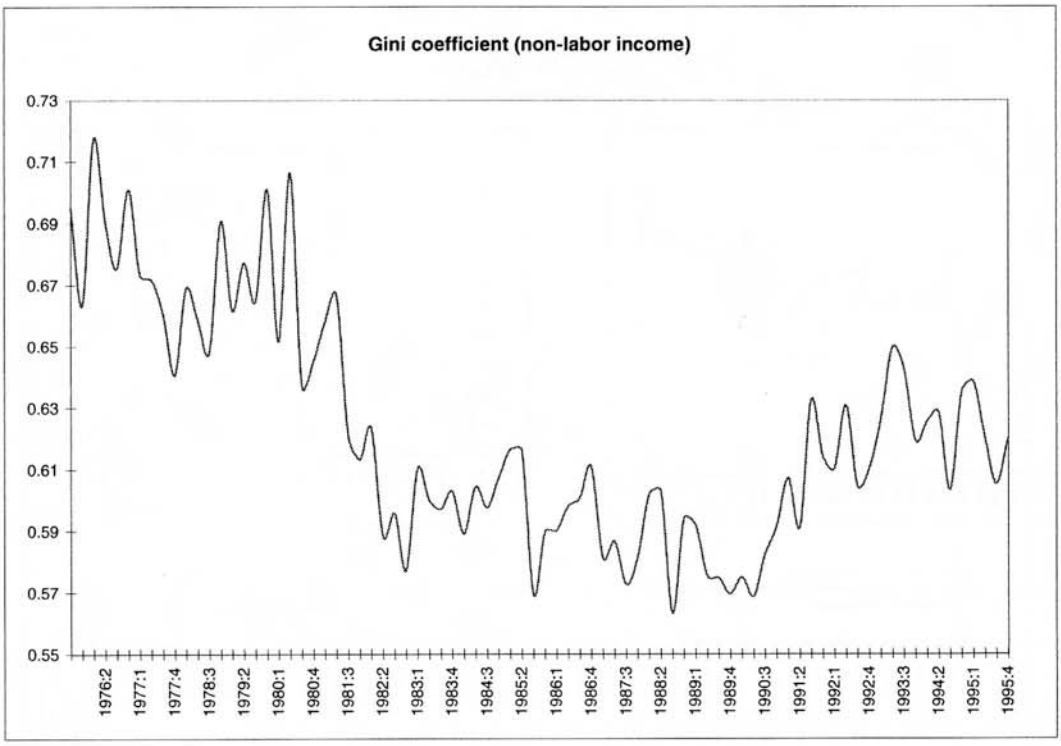


Figure 5

NON-LABOR INCOME DISTRIBUTION MEASURES



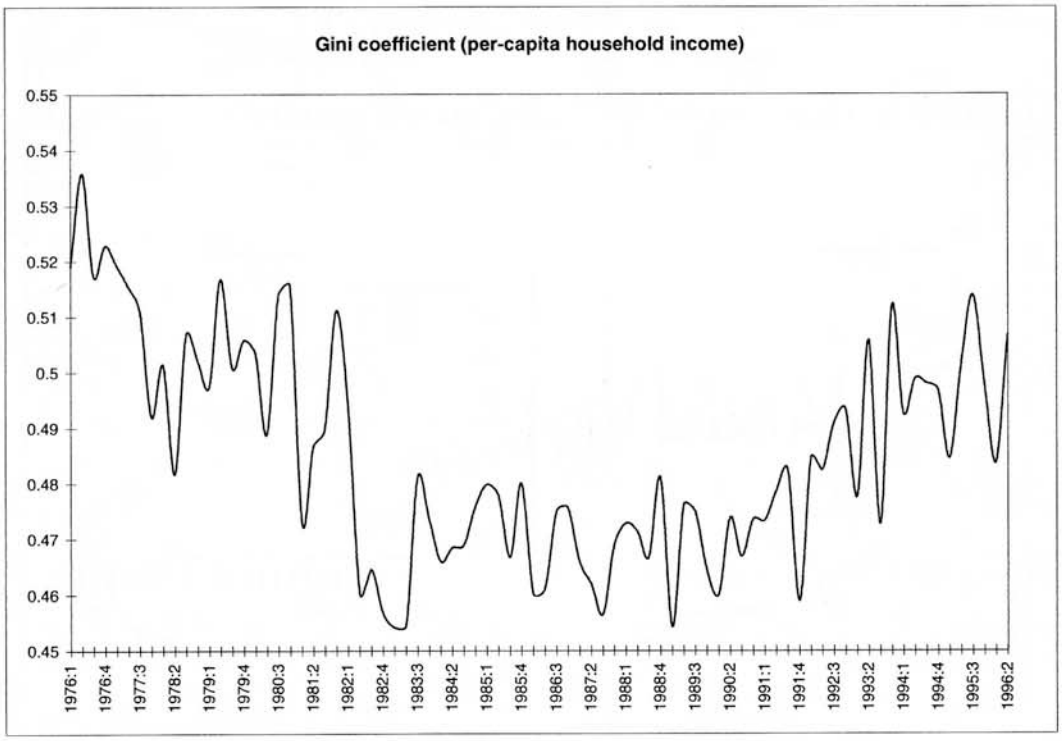
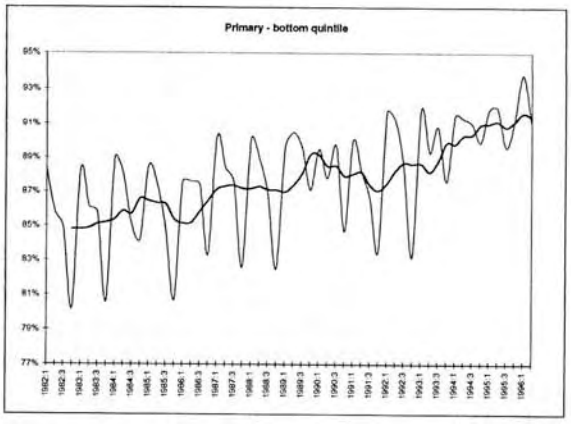
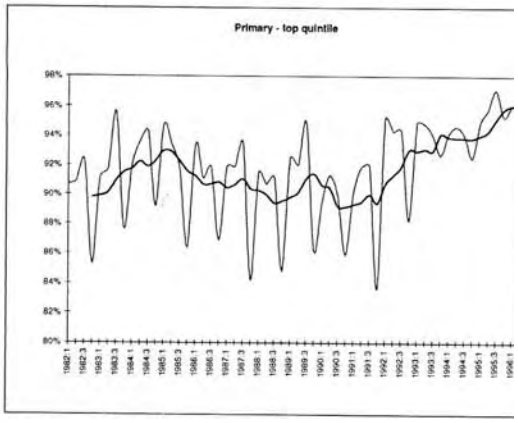
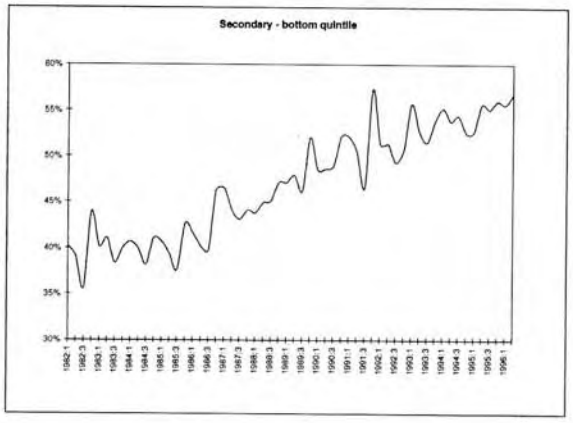


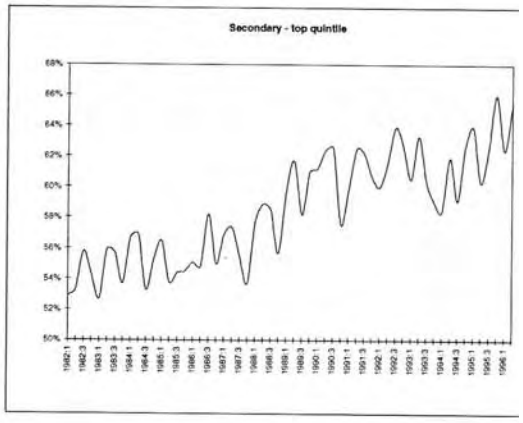
Figure 6

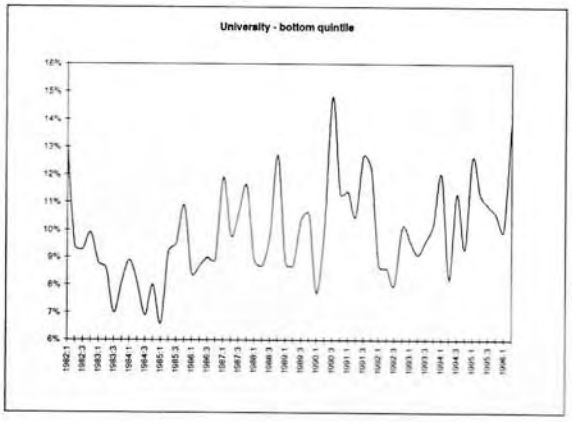
ENROLLMENT RATES BY INCOME QUINTILE











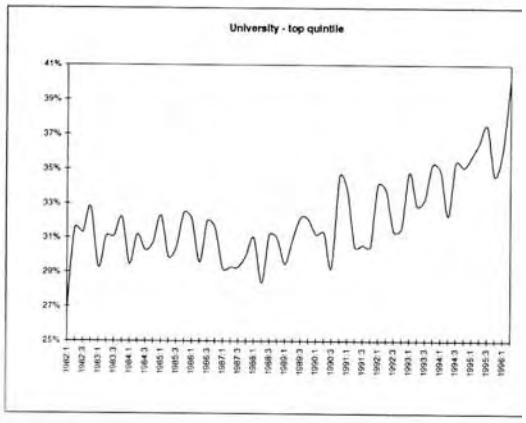
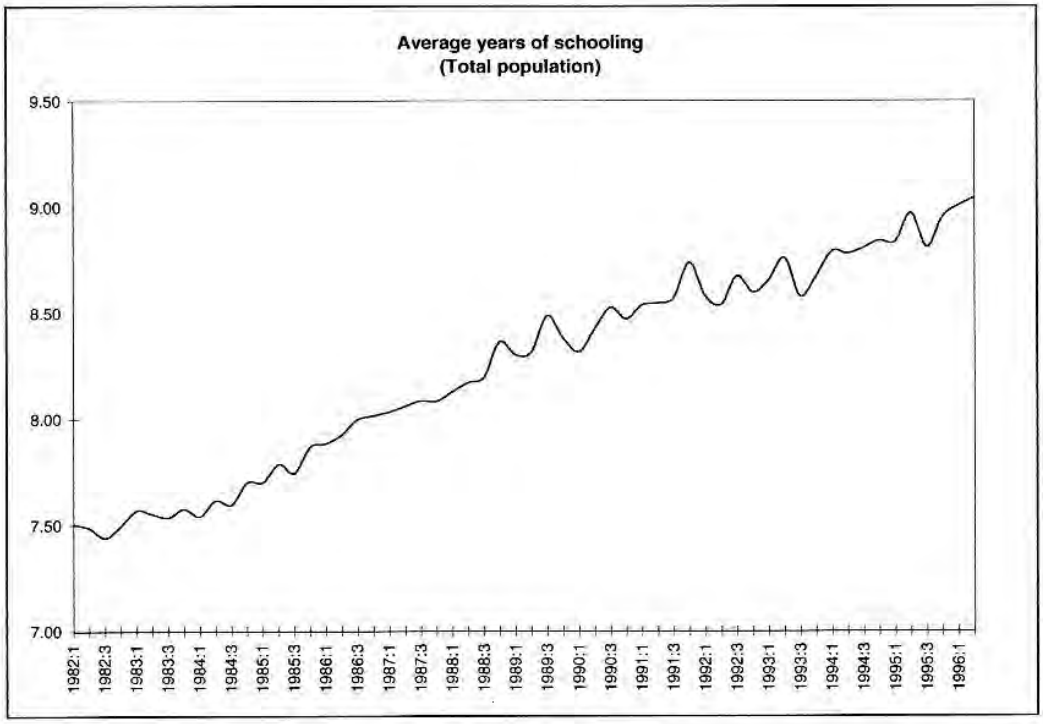


Figure 7


Average years of schooling
(Total population)
9.50
9.00
8.50
8.00
7.50
7.00
1982:1
1982:3
1983:1
1983:3
1984:1
1984:3
1985:1
1985:3
1986:1
1986:3
1987:1
1987:3
1988:1
1988:3
1989:1
1989:3
1990:1
1990:3
1991:1
1991:3
1992:1
1992:3
1993:1
1993:3
1994:1
1994:3
1995:1
1995:3
1996:1

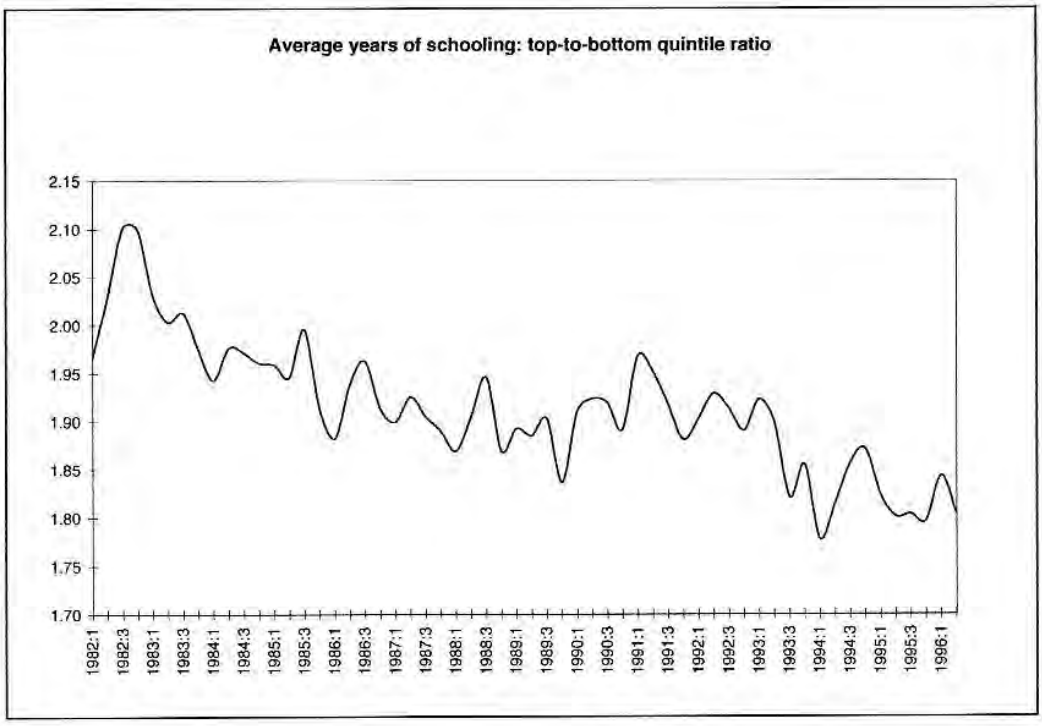
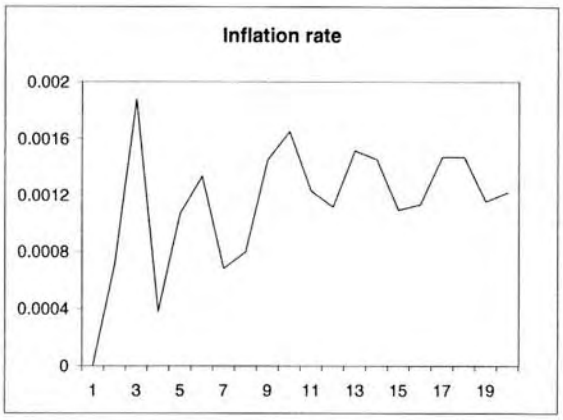
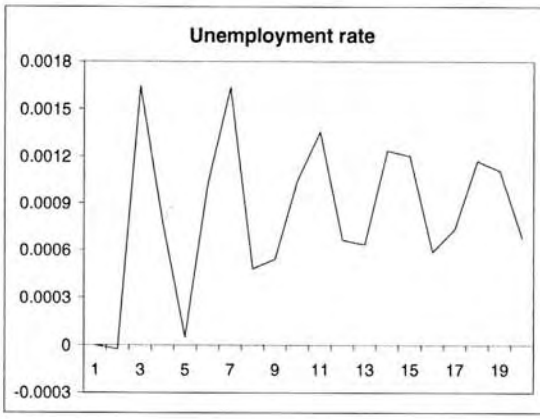
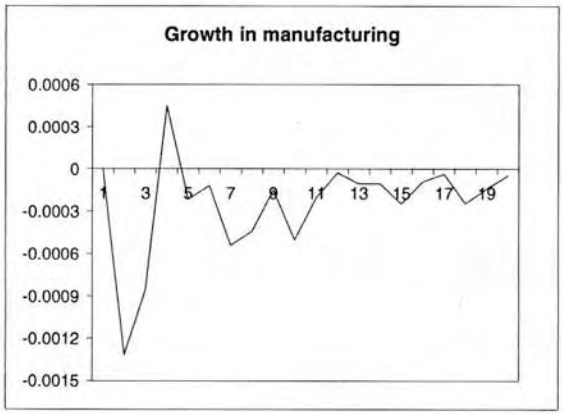

Average years of schooling: top-to-bottom quintile ratio
2.15
2.10
2.05
2.00
1.95
1.90
1.85
1.80
1.75
1.70
1982:1
1982:3
1983:1
1983:3
1984:1
1984:3
1985:1
1985:3
1986:1
1986:3
1987:1
1987:3
1988:1
1988:3
1989:1
1989:3
1990:1
1990:3
1991:1
1991:3
1992:1
1992:3
1993:1
1993:3
1994:1
1994:3
1995:1
1995:3
1996:1

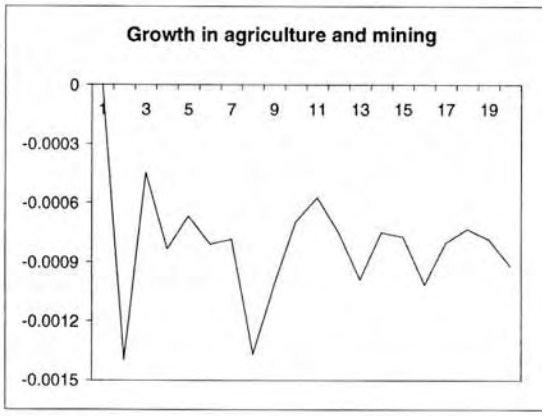
Figure 8

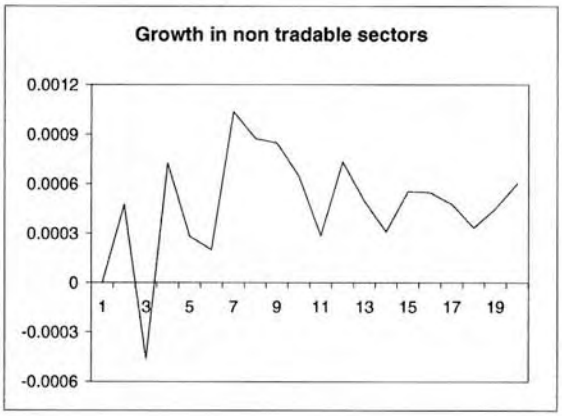
TOP-TO-BOTTOM QUINTILE RATIO FOR TOTAL HOUSEHOLD INCOME PER CAPITA
IMPULSE-RESPONSE TO MACROECONOMIC SHOCKS
One standard deviation increase in:











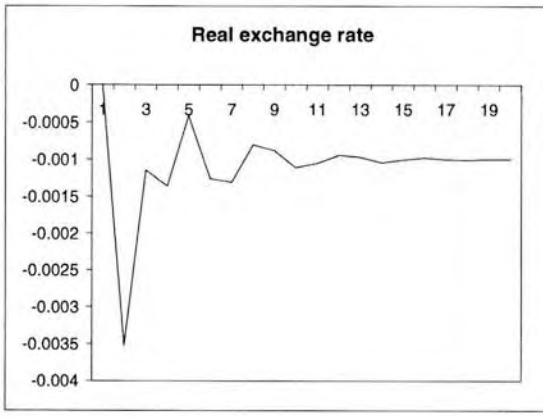
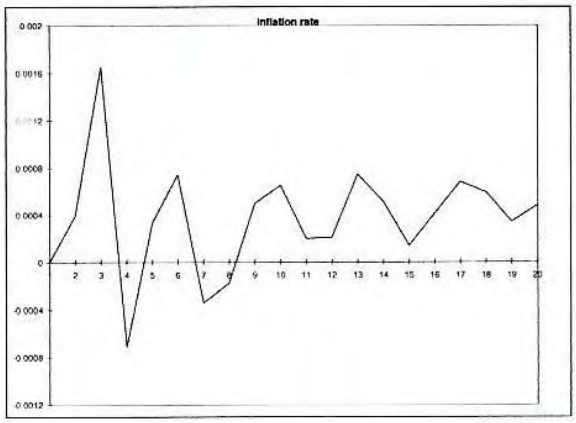
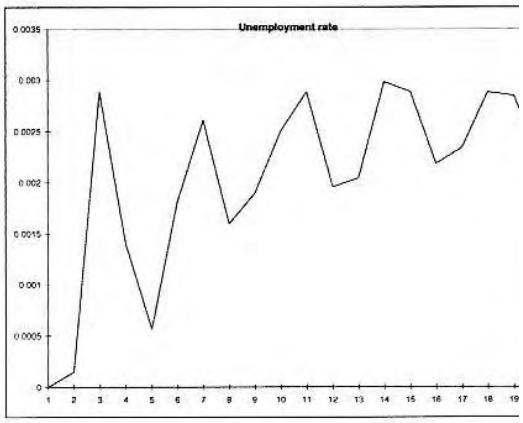
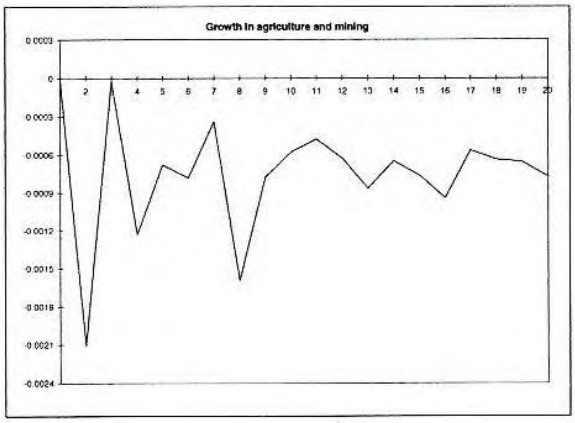


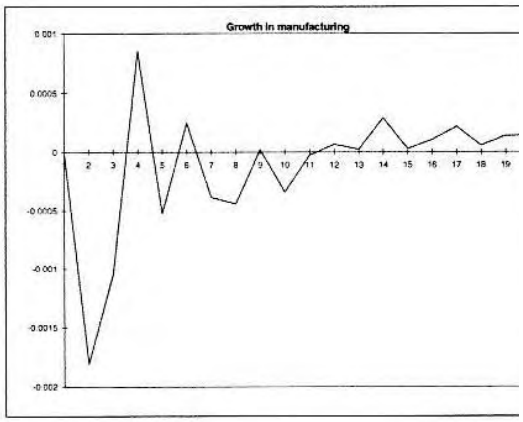
Figure 9

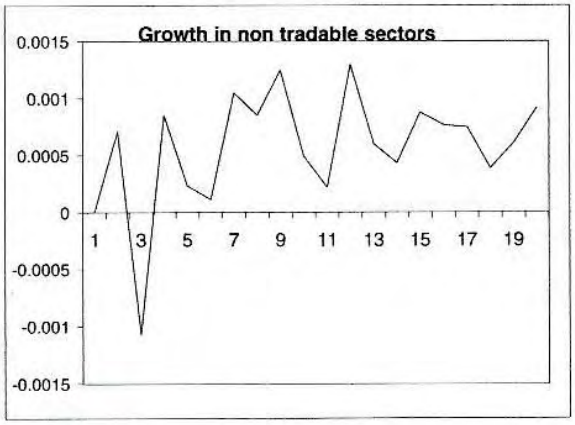
GINI COEFFICIENT FOR TOTAL HOUSEHOLD INCOME PER CAPITA
IMPULSE-RESPONSE TO MACROECONOMIC SHOCKS
One standard deviation increase in:











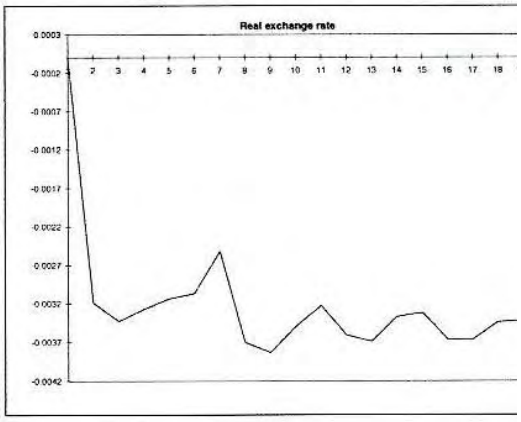
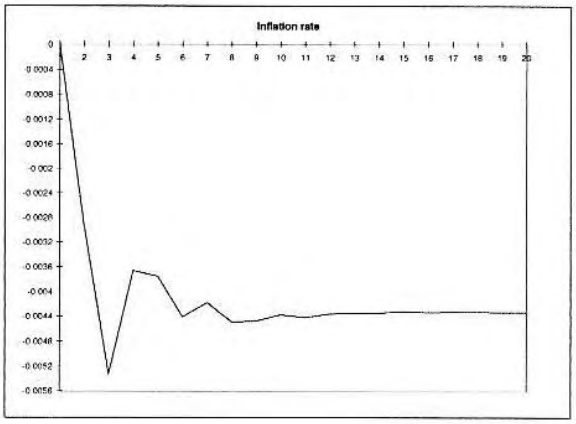
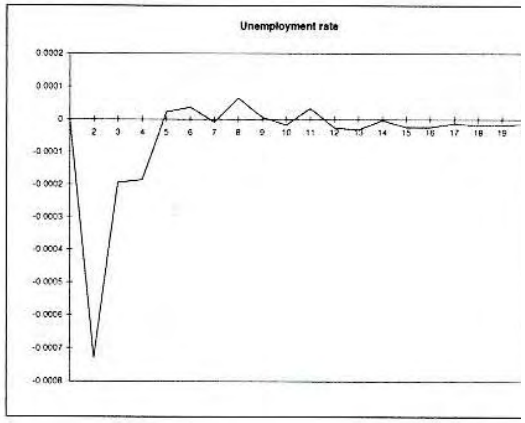
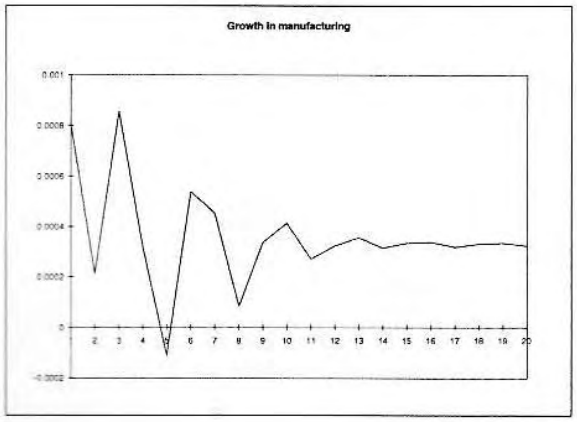


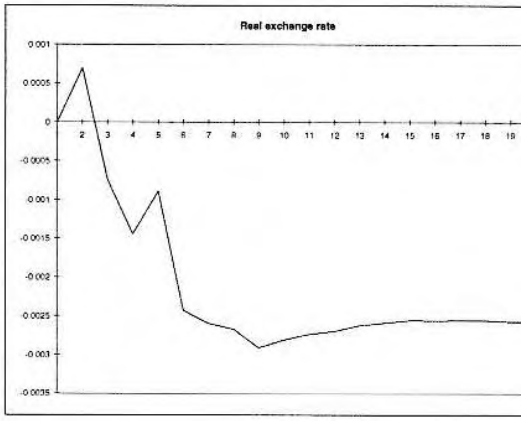
Figure 10

ENROLLMENT IN PRIMARY EDUCATION:
IMPULSE-RESPONSE TO MACROECONOMIC SHOCKS
One standard deviation increase in:









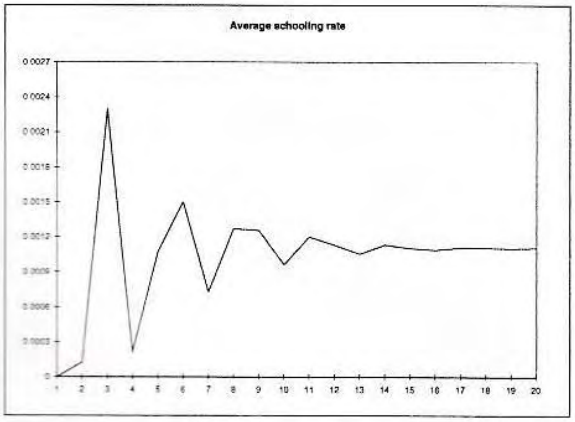


Table A1

UNIT ROOT TEST Quarterly Data					
VARIABLE	LAGS	OBSERVAT	ESTATISTIC	CRITICAL VALUE	DECISION
Inflation	8	73	τ = -0.3686	-1.9448	Does not reject Ho
Growth in manufacturing	5	68	τ_μ = -2.8425	-2.9042	Does not reject Ho
Growth in agriculture and mining	4	71	τ_μ = -2.7973	-2.9023	Does not reject Ho
Growth in non tradable sectors	4	69	τ_μ = -1.7639	-2.9035	Does not reject Ho
Unemployment rate	5	76	τ_μ = -2.4235	-2.8996	Does not reject Ho
Annual growth in urban employment	4	73	τ_μ = -3.3682	-3.4713	Does not reject Ho
Annual growth in productivity	4	69	τ_μ = -2.5787	-2.9035	Does not reject Ho
Real exchange rate	5	76	τ_μ = -1.1566	-2.8996	Does not reject Ho
Top to bottom quintile ratio (labor in	2	79	τ_μ = -2.3859	-2.8981	Does not reject Ho
Gini coefficient	3	78	τ_μ = -2.0773	-2.8986	Does not reject Ho
Theil index	3	78	τ_μ = -2.5054	-2.8986	Does not reject Ho
Top to bottom quintile ratio (total inc.	2	79	τ_μ = -2.5458	-2.8981	Does not reject Ho
Gini coefficient	2	79	τ_μ = -2.4724	-28981	Does not reject Ho
Primary coverage bottom quintile	4	53	τ_β = -3.0063	-3.4952	Does not reject Ho
Primary coverage top quintile	3	54	τ_μ = -0.0466	-2.9157	Does not reject Ho
Secondary coverage bottom quintile	3	54	τ_β = -2.7381	-3.4935	Does not reject Ho
Secondary coverage top quintile	2	55	τ_β = -2.6558	-3.4919	Does not reject Ho
University coverage bottom quintile	5	52	τ_μ = -2.0870	-2.9871	Does not reject Ho
University coverage top quintile	4	53	τ_β = -0.4269	-3.4952	Does not reject Ho
Bottom quintile's schooling rate	2	58	τ_β = -3.4610	-3.4875	Does not reject Ho
Top quintile's schooling rate	1	58	τ_β = -3.1165	-3.4875	Does not reject Ho
Primary coverage	4	53	τ_μ = -1.2536	-2.9167	Does not reject Ho
Secondary coverage	3	54	τ_β = -2.2595	-3.4935	Does not reject Ho
University coverage	3	54	τ_β = -1.9541	-3.4935	Does not reject Ho
Schooling rate	2	55	τ_β = -1.7137	-3.4919	Does not reject Ho

Ho: Existence of unit root
Critical values at 5% significance

Table A2

STATIONAL UNIT ROOT TEST: HEGY Quarterly Data										
VARIABLE	LAGS	OBS.	t' STAT Ho: π_1=0	Ho: π_2=0	Ho: π_3=0	Ho: π_4=0	'F' Ho: π_3 y π_4=0	INTERCEPT ' t '	TREND ' t '	STATIONAL DUMMIES
Inflation	4	74	-2.54 (-2.96)	-4.70 (-1.95)	-5.81 (-1.90)	-3.82 (-1.72)	31.24 (3.04)	2.47		
Growth in urban GDP	1	69	-2.42 (-2.88)	-6.49 (-1.95)	-8.42 (-1.90)	-2.75 (-1.72)	40.3 (3.08)	2.02		
Unemployment rate	2	76	-2.42 (-2.88)	-3.37 (-1.95)	-2.42 (-1.90)	-1.05 (-1.72)	3.59 (3.08)	2.44		
Real exchange rate	2	76	-1.15 (-2.88)	-1.50 (-1.95)	-2.85 (-1.90)	-2.28 (-1.72)	7.32 (3.08)	1.28		
Top to bottom quintile ratio (labor income)	0	78	-2.47 (-2.88)	-4.10 (-1.95)	-5.24 (-1.90)	-0.97 (-1.72)	14.79 (3.08)	2.36		
Gini coefficient	1	77	-2.01 (-2.95)	-4.16 (-2.94)	-6.09 (-3.44)	-2.05 (-1.96)	20.40 (6.57)	2.11		-3.1, -0.63, 0.19
Theil index	1	77	-1.63 (-2.88)	-4.85 (-1.95)	-5.24 (-1.90)	-1.77 (-1.72)	15.48 (3.08)	1.65		
Top to bottom quintile ratio (other income)	0	78	-1.90 (-2.95)	-4.67 (-2.94)	-7.17 (-3.44)	-0.21 (-1.96)	25.84 (6.57)	1.96		-2.2, 0.45, -0.01
Gini coefficient	0	78	-2.09 (-2.95)	-4.65 (-2.94)	-7.36 (-3.44)	-0.64 (-1.96)	27.76 (6.57)	2.20		-2.8, -0.78, -0.27
Theil index	0	78	-0.64 (-1.95)	-6.37 (-1.95)	-5.59 (-1.93)	-3.56 (-1.76)	29.32 (3.26)			
Top to bottom quintile ratio (per-capita household income)	1	77	-2.31 (-2.95)	-4.52 (-2.94)	-6.14 (-3.44)	-2.14 (-1.96)	21.10 (6.57)	2.35		-2.06, -0.2, 0.26
Gini coefficient	0	78	-2.23 (-2.95)	-4.18 (-2.94)	-6.05 (-3.44)	-0.74 (-1.96)	19.25 (6.57)	2.29		-2.06, -0.8, -0.3
Primary coverage bottom quintile	0	54	-3.12 (-3.53)	-2.44 (-2.94)	-3.38 (-3.48)	-1.83 (-1.94)	9.02 (6.60)	3.06	2.92	3.92, 1.66, 0.74
Primary coverage top quintile	0	54	-0.61 (-2.95)	-2.68 (-2.94)	-3.68 (-3.44)	-0.55 (-1.96)	6.98 (6.57)	0.37		3.27, 3.03, 2.88
Secondary coverage bottom quinti	1	53	-2.20 (-3.53)	-3.94 (-2.94)	-4.75 (-3.48)	-1.47 (-1.94)	12.62 (6.60)	2.51	2.29	-1.8, -2.28, -3.61
Secondary coverage top quintile	0	54	-2.34 (-3.53)	-4.41 (-2.94)	-4.87 (-3.48)	-0.93 (-1.94)	12.68 (6.60)	2.29	2.36	0.62, 1.86, 1.20
University coverage bottom quintil	0	54	-3.04 (-3.47)	-2.86 (-1.94)	-3.93 (-1.89)	-0.90 (-1.65)	8.44 (2.98)	2.83	2.53	
University coverage top quintile	1	53	-0.42 (-3.47)	-3.82 (-1.94)	-2.97 (-1.89)	-0.12 (-1.65)	4.44 (2.98)	0.33	1.76	
Primary coverage	0	54	-1.57 (-2.95)	-2.23 (-2.94)	-3.40 (-3.44)	-1.46 (-1.96)	7.83 (6.57)	1.41		3.86, 2.64, 1.57
Secondary coverage	0	54	-2.57 (-3.53)	-4.13 (-2.94)	-4.99 (-3.48)	-0.45 (-1.94)	12.78 (6.60)	2.72	2.64	-1.92, -1.08, -4.0
University coverage	0	54	-1.95 (-3.47)	-2.92 (-1.94)	-2.42 (-1.89)	-0.82 (-1.65)	3.42 (2.98)	1.87	2.7	
Bottom quintile's schooling rate	0	54	-1.91 (-3.47)	-2.83 (-1.94)	-3.49 (-1.89)	-0.26 (-1.65)	7.15 (2.98)	2.00	1.90	
Top quintile's schooling rate	0	56	-2.58 (-3.47)	-5.11 (-1.94)	-6.09 (-1.89)	-0.75 (-1.65)	26.09 (2.98)	2.61	2.52	
Schooling rate	0	54	-1.62 (-3.47)	-4.52 (-1.94)	-5.39 (-1.89)	-0.93 (-1.65)	15.81 (2.98)	1.69	1.56	

Critical values in Hyllberg, Engle, Granger y Yoo (1990).

Table A3

JOHANSEN COINTEGRATION TESTS

Income distribution measures

SYSTEM	LAGS	OBSERV	TEST LR	TEST CV 5%	TEST CV 1%	
I. LABOR INCOME BY INDIVIDUAL						
A. Top to bottom quintile ratio, unemployment, inflation, growth in manufacturing, growth in agriculture and mining, growth in non tradable sectors, real exchange rate, dummy 82	3	64	252.94	165.58	177.20	**
			172.19	131.70	143.09	**
			100.03	102.14	111.01	
			69.82	76.07	84.45	
			45.07	53.12	60.16	
			27.03	34.91	41.07	
			12.54	19.96	24.60	
			4.25	9.24	12.97	
B. Gini, unemployment, growth in manufacturing, growth in agriculture and mining, growth in non tradable sectors, real exchange rate, dummy 82	3	64	247.16	165.58	177.20	**
			167.86	131.70	143.09	**
			100.85	102.14	111.01	
			69.76	76.07	84.45	
			45.51	53.12	60.16	
			25.34	34.91	41.07	
			11.67	19.96	24.60	
			4.71	9.24	12.97	
C. Gini, growth in urban employment, inflation, growth in multifactorial productivity, real exchange rate, dummy 82	3	64	252.94	165.58	177.20	**
			172.19	131.70	143.09	**
			100.03	102.14	111.01	
			69.82	76.07	84.45	
			45.07	53.12	60.16	
			27.03	34.91	41.07	
			12.54	19.96	24.60	
			4.25	9.24	12.97	
II. TOTAL HOUSEHOLD INCOME PER CAPITA						
A. Top to bottom quintile ratio, unemployment, inflation, growth in manufacturing, growth in agriculture and mining, growth in non tradable sectors, real exchange rate, dummy 82	3	64	237.87	141.20	152.32	**
			156.25	109.99	119.8	**
			82.01	82.49	90.45	
			51.09	59.46	66.52	
			25.70	39.86	45.58	
			12.32	24.31	29.75	
			5.06	12.53	16.31	
			0.28	3.84	6.51	
B. Gini, unemployment, growth in manufacturing, growth in agriculture and mining, growth in non tradable sectors, real exchange rate, dummy 82	3	64	269.71	165.58	177.20	**
			183.71	131.70	143.09	**
			110.21	102.14	111.01	*
			76.01	76.07	84.45	
			48.96	53.12	60.16	
			25.24	34.91	41.07	
			11.81	19.96	24.60	
			5.10	9.24	12.97	
C. Gini, growth in urban employment, inflation, growth in multifactorial productivity, real exchange rate, dummy 82	3	64	247.16	165.58	177.20	**
			167.86	131.70	143.09	**
			100.85	102.14	111.01	
			69.76	76.07	84.45	
			45.51	53.12	60.16	
			25.34	34.91	41.07	
			11.67	19.96	24.60	
			4.71	9.24	12.97	

Table A4

JOHANSEN COINTEGRATION TESTS

Enrollment Rates by Quintile

SYSTEM	LAGS	OBSERV	TEST LR	CV 5%	CV 1%	
Enrollment in primary education (bottom quintile), inflation, unemployment, growth in manufacturing, real exchange rate, average years of schooling in bottom quintile	2	55	134.79	94.15	103.18	**
			76.31	68.52	76.07	**
			47.02	47.21	54.46	
			24.22	29.68	35.65	
			9.36	15.41	20.04	
			0.07	3.76	6.65	
Enrollment in secondary education (bottom quintile) inflation, unemployment, growth in manufacturing, real exchange rate, average years of schooling in bottom quintile	1	56	100.51	94.15	103.18	*
			69.33	68.52	76.07	*
			43.72	47.21	54.46	
			22.48	29.68	35.65	
			7.89	15.41	20.04	
			0.17	3.76	6.65	
Enrollment in university education (bottom quintile), inflation, unemployment, growth in manufacturing, real exchange rate, average years of schooling in bottom quintile	1	56	111.45	102.14	110.01	**
			76.69	76.07	84.45	*
			50.89	53.12	60.16	
			32.00	34.91	41.07	
			15.67	19.96	24.60	
			5.97	9.24	12.97	
Enrollment in primary education (top quintile), inflation, unemployment, growth in manufacturing, real exchange rate, average years of schooling in top quintile	1	56	101.71	94.15	103.18	*
			69.32	68.52	76.07	*
			46.40	47.21	54.46	
			24.81	29.68	35.65	
			9.26	15.41	20.04	
			1.76	3.76	6.65	
Enrollment in secondary education (top quintile), inflation, unemployment, growth in manufacturing, real exchange rate, average years of schooling in top quintile	1	56	141.35	114.90	124.75	**
			88.53	87.31	96.58	*
			62.15	62.99	70.05	
			41.34	42.44	48.45	
			21.31	25.32	30.45	
			6.21	12.25	16.26	
Enrollment in university education (top quintile), inflation, unemployment, growth in manufacturing, real exchange rate, average years of schooling in top quintile	1	56	107.90	94.15	103.18	**
			65.67	68.52	76.07	
			43.09	47.21	54.46	
			22.91	29.68	35.65	
			7.94	15.41	20.04	
			0.64	3.76	6.65	

STATISTICAL APPENDIX

DATE	TOTAL HOUSEHOLD INCOME PER CAPITA DISTRIBUTION						LABOR INCOME DISTRIBUTION BY INDIVIDUAL							
	quintile 1	quintile 2	quintile 3	quintile 4	quintile 5	gini	quintile 1	quintile 2	quintile 3	quintile 4	quintile 5	gini	theil index	within groups
1976:1	3.861	7.294	11.248	18.495	59.102	0.519	4.910	8.290	12.011	18.508	56.282	0.484	0.5181	0.3224
1976:2	3.663	6.996	10.666	17.756	60.916	0.536	4.934	7.982	11.437	17.798	57.850	0.496	0.6046	0.4205
1976:3	3.930	7.411	11.110	18.532	59.016	0.517	5.223	8.807	11.897	18.204	55.870	0.474	0.4941	0.2966
1976:4	3.822	7.154	11.077	18.547	59.400	0.523	5.069	8.645	11.701	17.903	56.682	0.482	0.5183	0.3191
1977:1	3.946	7.284	11.028	18.559	59.181	0.519	5.224	8.983	11.811	17.795	56.187	0.475	0.4905	0.2815
1977:2	3.872	7.483	11.504	18.370	58.771	0.515	5.171	8.838	12.141	17.654	56.179	0.476	0.5294	0.3487
1977:3	3.889	7.564	11.501	18.908	58.136	0.511	5.243	8.578	12.005	17.824	56.335	0.477	0.5396	0.3767
1977:4	4.357	8.066	11.994	18.900	56.682	0.492	5.361	9.019	12.176	17.979	55.465	0.467	0.4796	0.3083
1978:1	4.114	7.965	11.832	18.595	57.494	0.501	5.136	9.119	12.284	18.063	55.393	0.469	0.5155	0.3441
1978:2	4.334	8.270	12.520	19.747	55.129	0.482	5.509	10.208	13.049	18.897	52.333	0.439	0.4477	0.2959
1978:3	4.004	7.794	11.697	18.365	58.140	0.507	5.249	9.255	12.139	17.900	55.456	0.467	0.4772	0.3155
1978:4	4.070	7.897	11.803	18.663	57.566	0.502	5.460	9.484	12.171	17.696	55.187	0.462	0.4770	0.3200
1979:1	4.136	8.001	11.910	18.961	56.992	0.498	5.670	9.713	12.204	17.491	54.918	0.456	0.4767	0.3245
1979:2	4.015	7.581	11.362	17.819	59.221	0.517	5.183	9.165	11.802	17.191	56.651	0.478	0.5608	0.3690
1979:3	4.259	7.867	11.764	18.663	57.443	0.501	5.667	9.317	12.154	17.693	55.169	0.462	0.5117	0.3641
1979:4	4.117	7.754	11.692	18.410	58.026	0.506	5.588	9.029	12.377	18.163	54.840	0.462	0.4633	0.2826
1980:1	4.154	7.920	11.604	18.604	57.718	0.503	5.471	9.776	12.296	18.038	54.420	0.456	0.5012	0.3484
1980:2	4.319	8.236	12.222	19.104	56.119	0.489	5.324	9.830	12.741	18.548	53.558	0.450	0.4657	0.3388
1980:3	3.977	7.567	11.515	18.286	58.653	0.514	5.684	9.058	12.003	17.414	55.841	0.466	0.4940	0.2962
1980:4	3.876	7.502	11.531	18.275	58.816	0.516	5.560	8.807	12.077	18.228	55.324	0.466	0.4933	0.3324
1981:1	4.768	8.564	12.748	18.909	55.011	0.473	5.501	10.049	12.853	18.460	53.135	0.445	0.4719	0.3363
1981:2	4.407	8.088	12.149	19.449	55.907	0.487	5.831	9.510	12.800	18.826	53.025	0.444	0.4503	0.3269
1981:3	4.148	8.118	12.379	19.307	56.047	0.490	5.891	9.508	12.825	18.695	53.081	0.443	0.4583	0.3303
1981:4	4.024	7.649	11.468	18.519	58.341	0.511	5.709	8.792	12.099	18.065	55.327	0.465	0.5292	0.3714
1982:1	4.165	8.118	12.226	18.796	56.696	0.495	5.720	10.229	12.544	18.628	52.879	0.441	0.4869	0.3511
1982:2	4.873	8.749	12.977	20.048	53.354	0.460	6.364	10.011	13.436	19.709	50.481	0.417	0.4048	0.2781
1982:3	4.803	8.736	12.869	19.687	53.905	0.465	6.463	9.976	13.389	19.628	50.544	0.417	0.3930	0.2695
1982:4	4.962	8.819	13.073	20.149	52.995	0.457	6.467	9.966	13.508	19.829	50.225	0.415	0.3719	0.2404
1983:1	4.903	8.887	13.221	20.365	52.624	0.454	6.612	10.541	13.842	19.722	49.280	0.402	0.3448	0.2278
1983:2	5.001	8.908	13.043	20.255	52.794	0.455	6.578	10.431	13.796	19.496	49.700	0.406	0.3628	0.2396
1983:3	4.541	8.376	12.429	19.206	55.449	0.481	6.111	9.813	13.131	18.745	52.195	0.433	0.4820	0.3519
1983:4	4.575	8.558	12.635	19.619	54.612	0.474	6.007	9.896	13.363	19.236	51.494	0.429	0.4268	0.2895
1984:1	4.736	8.642	12.890	19.906	53.827	0.466	5.971	10.596	13.547	19.514	50.369	0.417	0.3839	0.2581
1984:2	4.655	8.586	12.882	19.821	54.057	0.468	5.899	10.485	13.689	19.796	50.132	0.417	0.3900	0.2631
1984:3	4.631	8.616	12.903	19.745	54.105	0.469	5.781	10.261	13.519	19.677	50.760	0.424	0.3931	0.2623
1984:4	4.527	8.468	12.605	19.633	54.765	0.476	5.832	10.163	13.319	19.555	51.130	0.427	0.4107	0.2836
1985:1	4.534	8.310	12.454	19.459	55.242	0.480	5.783	10.534	13.090	19.099	51.494	0.428	0.4266	0.2994
1985:2	4.509	8.381	12.611	19.496	55.002	0.478	5.637	10.362	13.229	19.308	51.464	0.430	0.4366	0.3172
1985:3	4.575	8.652	12.964	20.076	53.730	0.467	5.894	10.593	13.555	19.892	50.067	0.417	0.3814	0.2664
1985:4	4.531	8.351	12.514	19.279	55.326	0.480	6.075	10.376	13.179	19.071	51.300	0.425	0.4389	0.3180
1986:1	4.808	8.851	13.073	19.992	53.276	0.460	6.084	11.163	13.722	19.712	49.320	0.405	0.3799	0.2792
1986:2	4.754	8.773	13.146	20.030	53.297	0.461	6.072	11.022	13.816	19.905	49.183	0.405	0.3584	0.2493
1986:3	4.571	8.460	12.756	19.495	54.717	0.475	5.963	10.374	13.208	19.198	51.257	0.426	0.4594	0.3400
1986:4	4.641	8.515	12.587	19.333	54.926	0.476	6.113	10.277	12.960	18.940	51.711	0.428	0.4264	0.2902
1987:1	4.766	8.685	12.884	19.746	53.919	0.466	6.237	11.120	13.749	19.022	49.873	0.407	0.3830	0.2650

STATISTICAL APPENDIX

DATE	TOTAL HOUSEHOLD INCOME PER CAPITA DISTRIBUTION						LABOR INCOME DISTRIBUTION BY INDIVIDUAL							
	quintile 1	quintile 2	quintile 3	quintile 4	quintile 5	gini	quintile 1	quintile 2	quintile 3	quintile 4	quintile 5	gini	theil index	within groups
1987:2	4.932	8.813	12.931	19.572	53.752	0.462	6.497	10.950	13.859	19.075	49.620	0.404	0.3796	0.2605
1987:3	4.910	8.940	13.164	19.985	53.001	0.457	6.313	10.959	13.861	19.234	49.634	0.406	0.3739	0.2609
1987:4	4.853	8.700	12.680	19.291	54.477	0.469	6.447	10.488	13.346	18.687	51.029	0.417	0.4068	0.2877
1988:1	4.722	8.538	12.649	19.384	54.707	0.473	6.326	10.794	13.099	18.533	51.246	0.418	0.4311	0.3137
1988:2	4.652	8.571	12.755	19.612	54.409	0.471	6.057	10.624	13.088	18.959	51.272	0.423	0.4132	0.2944
1988:3	4.723	8.595	12.908	19.835	53.939	0.467	6.354	10.793	13.466	19.393	49.994	0.410	0.3689	0.2531
1988:4	4.509	8.356	12.436	19.314	55.384	0.481	6.425	10.223	12.805	18.656	51.889	0.426	0.4127	0.2771
1989:1	4.943	8.917	13.181	20.235	52.723	0.454	6.681	11.074	13.456	19.214	49.575	0.401	0.3640	0.2527
1989:2	4.671	8.458	12.555	19.319	54.997	0.476	6.228	10.445	12.956	18.719	51.650	0.425	0.4257	0.2997
1989:3	4.664	8.412	12.623	19.441	54.859	0.475	6.313	10.194	12.979	18.854	51.658	0.426	0.4133	0.2822
1989:4	4.848	8.651	12.855	19.820	53.825	0.464	6.533	10.247	12.979	19.027	51.214	0.420	0.3897	0.2762
1990:1	4.941	8.787	12.981	19.788	53.503	0.460	6.667	11.132	13.439	18.836	49.925	0.403	0.3590	0.2377
1990:2	4.650	8.400	12.614	19.705	54.631	0.474	6.204	10.433	13.137	19.067	51.159	0.421	0.3925	0.2729
1990:3	4.812	8.630	12.768	19.707	54.082	0.467	6.345	10.398	13.129	19.128	50.999	0.419	0.3865	0.2673
1990:4	4.718	8.565	12.554	19.247	54.916	0.474	6.236	10.077	12.728	18.719	52.240	0.431	0.4395	0.3214
1991:1	4.704	8.463	12.626	19.445	54.761	0.473	6.254	10.543	13.016	18.926	51.261	0.420	0.4018	0.2782
1991:2	4.585	8.333	12.449	19.465	55.167	0.479	6.121	10.292	12.887	18.874	51.824	0.427	0.4054	0.2714
1991:3	4.470	8.302	12.434	19.289	55.506	0.483	5.779	10.034	12.790	18.680	52.716	0.438	0.4634	0.3476
1991:4	4.922	8.860	13.021	19.875	53.322	0.459	6.459	10.277	13.355	19.515	50.393	0.414	0.3866	0.2719
1992:1	4.524	8.233	12.290	19.130	55.823	0.485	5.947	10.554	12.923	18.844	51.732	0.427	0.4204	0.2938
1992:2	4.502	8.228	12.359	19.389	55.522	0.482	5.514	10.046	12.790	18.979	52.671	0.441	0.4139	0.2791
1992:3	4.431	8.066	12.091	19.025	56.386	0.491	5.541	9.595	12.359	18.429	54.075	0.454	0.5074	0.3675
1992:4	4.492	8.123	12.027	18.404	56.954	0.493	5.906	9.573	12.337	18.334	53.851	0.449	0.4794	0.3332
1993:1	4.632	8.402	12.518	19.279	55.170	0.478	6.224	10.243	12.745	19.036	51.752	0.427	0.4237	0.2815
1993:2	4.300	7.851	11.566	18.113	58.170	0.506	5.644	9.056	11.614	17.664	56.019	0.471	0.5931	0.4349
1993:3	4.618	8.526	12.704	19.591	54.562	0.473	5.980	9.684	12.865	19.261	52.209	0.436	0.4388	0.3217
1993:4	4.107	7.615	11.545	18.236	58.497	0.512	5.756	8.811	11.752	17.750	55.930	0.470	0.5558	0.4075
1994:1	4.356	8.117	12.134	18.733	56.660	0.493	6.037	9.480	12.588	18.688	53.207	0.443	0.4693	0.3394
1994:2	4.278	7.947	11.927	18.565	57.283	0.499	5.917	9.141	12.441	18.520	53.980	0.452	0.4954	0.3572
1994:3	4.248	7.849	11.949	19.006	56.946	0.498	5.811	8.796	12.415	18.853	54.124	0.457	0.4891	0.3456
1994:4	4.298	7.940	11.953	18.846	56.963	0.497	5.908	8.796	12.290	18.734	54.273	0.457	0.4936	0.3394
1995:1	4.518	8.322	12.361	18.978	55.820	0.485	6.197	9.436	12.749	18.471	53.148	0.442	0.5051	0.3574
1995:2	4.286	7.911	11.819	18.374	57.609	0.502	5.918	9.061	12.435	18.245	54.341	0.456	0.5381	0.3890
1995:3	4.152	7.706	11.419	17.894	58.826	0.514	5.676	8.604	11.984	17.455	56.282	0.475	0.6457	0.4745
1995:4	4.305	7.919	11.939	18.776	57.061	0.498	5.878	8.774	12.217	18.238	54.893	0.462	0.5351	0.3796
1996:1	4.392	8.138	12.363	19.655	55.451	0.484	6.224	9.845	13.098	19.618	51.214	0.425	0.4010	0.2569
1996:2	4.109	7.643	11.742	18.705	57.801	0.507	5.852	9.299	12.395	18.510	53.945	0.452	0.5013	0.3388

STATISTICAL APPENDIX

DATE	NON-LABOR INCOME DISTRIBUTION BY INDIVIDUAL						ENROLLMENT RATES BY INCOME QUINTILE								
							Quintile 1			Quintile 5			Overall		
	quintile 1	quintile 2	quintile 3	quintile 4	quintile 5	gini	primary	secondary	universitary	primary	secondary	universitary	primary	secondary	universitary
1976:1	1.787	4.982	9.595	19.708	63.929	0.695									
1976:2	2.107	5.361	10.828	21.159	60.527	0.663									
1976:3	1.901	4.556	8.927	17.376	67.199	0.717									
1976:4	2.184	5.059	9.803	18.397	64.557	0.690									
1977:1	2.177	5.409	10.146	19.686	62.582	0.675									
1977:2	1.827	4.660	9.629	19.273	64.612	0.701									
1977:3	2.338	5.439	10.100	19.470	62.654	0.673									
1977:4	2.004	5.274	10.821	20.166	61.737	0.672									
1978:1	2.244	5.699	10.914	20.000	61.118	0.660									
1978:2	2.394	5.731	12.208	20.718	58.936	0.640									
1978:3	2.014	5.513	10.800	20.033	61.619	0.669									
1978:4	2.178	5.591	11.220	20.368	60.633	0.659									
1979:1	2.342	5.668	11.641	20.702	59.647	0.648									
1979:2	1.902	5.086	10.006	18.997	63.989	0.691									
1979:3	2.190	5.849	10.539	20.272	61.152	0.662									
1979:4	2.069	5.521	10.233	19.266	62.902	0.677									
1980:1	2.289	5.931	10.706	18.704	62.376	0.665									
1980:2	2.075	5.514	9.704	15.574	67.133	0.701									
1980:3	2.107	5.945	11.335	20.757	59.857	0.652									
1980:4	1.685	5.192	9.221	18.017	65.886	0.706									
1981:1	2.304	6.878	11.738	19.297	59.783	0.637									
1981:2	2.389	6.525	11.015	19.788	60.223	0.645									
1981:3	2.350	5.858	11.004	19.451	61.328	0.658									
1981:4	2.225	5.978	10.626	18.588	62.583	0.667									
1982:1	2.493	6.705	12.627	20.505	57.671	0.621	0.883	0.402	0.130	0.907	0.529	0.269	0.915	0.482	0.175
1982:2	2.794	7.669	12.220	18.738	58.545	0.613	0.858	0.391	0.094	0.909	0.533	0.316	0.899	0.478	0.175
1982:3	2.675	7.239	12.091	18.733	59.247	0.623	0.849	0.356	0.093	0.923	0.558	0.313	0.900	0.474	0.173
1982:4	3.009	8.005	12.967	20.357	55.654	0.588	0.802	0.439	0.099	0.853	0.543	0.328	0.845	0.504	0.185
1983:1	2.980	7.910	12.778	19.650	56.668	0.596	0.883	0.402	0.088	0.911	0.527	0.293	0.920	0.490	0.166
1983:2	3.320	8.265	13.303	19.904	55.208	0.577	0.861	0.411	0.086	0.917	0.559	0.311	0.908	0.486	0.165
1983:3	2.797	7.544	12.437	19.272	57.950	0.610	0.858	0.384	0.070	0.956	0.557	0.311	0.921	0.475	0.169
1983:4	2.925	7.818	12.452	19.949	56.835	0.600	0.806	0.400	0.081	0.877	0.537	0.322	0.865	0.497	0.186
1984:1	2.809	7.706	13.013	20.215	56.248	0.597	0.890	0.407	0.089	0.920	0.567	0.295	0.919	0.495	0.166
1984:2	2.986	7.939	12.353	18.961	57.761	0.603	0.881	0.400	0.081	0.936	0.569	0.312	0.925	0.493	0.168
1984:3	3.002	8.228	12.780	19.952	56.039	0.589	0.851	0.382	0.069	0.943	0.533	0.303	0.914	0.478	0.167
1984:4	2.872	7.769	12.440	19.476	57.444	0.604	0.842	0.411	0.080	0.892	0.553	0.307	0.878	0.493	0.174
1985:1	2.927	7.891	12.826	19.439	56.911	0.598	0.885	0.407	0.066	0.947	0.565	0.323	0.928	0.503	0.167
1985:2	2.732	7.410	12.759	19.917	57.177	0.607	0.875	0.394	0.092	0.934	0.538	0.299	0.916	0.495	0.170
1985:3	2.499	7.163	12.673	19.894	57.771	0.616	0.848	0.376	0.095	0.918	0.544	0.304	0.908	0.480	0.170
1985:4	2.774	7.425	12.177	19.021	58.585	0.616	0.807	0.426	0.109	0.864	0.545	0.325	0.839	0.504	0.187
1986:1	3.114	8.466	14.084	20.110	54.226	0.569	0.876	0.417	0.084	0.934	0.551	0.321	0.921	0.504	0.177
1986:2	2.901	7.955	13.350	19.930	55.857	0.590	0.876	0.402	0.087	0.911	0.548	0.296	0.913	0.496	0.170
1986:3	3.017	7.935	13.269	19.577	56.203	0.590	0.874	0.397	0.090	0.919	0.582	0.320	0.915	0.501	0.186
1986:4	3.056	8.058	12.654	18.696	57.536	0.598	0.833	0.463	0.089	0.869	0.550	0.316	0.874	0.530	0.191
1987:1	2.905	7.621	13.264	18.841	57.363	0.601	0.902	0.465	0.119	0.919	0.569	0.292	0.929	0.521	0.173
1987:2	2.858	7.588	12.456	18.715	58.383	0.611	0.884	0.441	0.098	0.919	0.574	0.293	0.919	0.518	0.166
1987:3	3.088	8.228	13.473	19.806	55.406	0.581	0.876	0.431	0.106	0.935	0.555	0.293	0.926	0.503	0.174

STATISTICAL APPENDIX

DATE	NON-LABOR INCOME DISTRIBUTION BY INDIVIDUAL						ENROLLMENT RATES BY INCOME QUINTILE								
							Quintile 1			Quintile 5			Overall		
	quintile 1	quintile 2	quintile 3	quintile 4	quintile 5	gini	primary	secondary	universitary	primary	secondary	universitary	primary	secondary	universitary
1987:4	3.167	8.373	12.852	19.178	56.430	0.587	0.826	0.441	0.116	0.842	0.537	0.300	0.857	0.508	0.181
1988:1	3.213	8.468	13.720	19.795	54.795	0.573	0.901	0.438	0.089	0.915	0.577	0.310	0.929	0.517	0.182
1988:2	3.106	8.229	13.485	19.724	55.457	0.581	0.889	0.449	0.087	0.907	0.589	0.284	0.917	0.524	0.170
1988:3	3.031	7.782	12.768	18.624	57.796	0.602	0.869	0.451	0.098	0.912	0.585	0.312	0.916	0.521	0.184
1988:4	3.013	7.874	12.594	18.510	58.006	0.603	0.825	0.471	0.127	0.848	0.557	0.310	0.859	0.538	0.188
1989:1	3.225	8.611	14.226	20.180	53.748	0.563	0.896	0.471	0.088	0.925	0.597	0.295	0.928	0.547	0.171
1989:2	2.914	7.954	13.284	19.114	56.732	0.594	0.905	0.479	0.087	0.920	0.617	0.309	0.924	0.547	0.172
1989:3	3.022	8.094	13.057	19.131	56.697	0.592	0.896	0.462	0.104	0.949	0.582	0.322	0.927	0.550	0.192
1989:4	3.422	8.842	12.927	18.891	55.909	0.575	0.871	0.520	0.106	0.862	0.610	0.321	0.875	0.561	0.189
1990:1	3.089	8.389	14.012	19.511	54.996	0.575	0.895	0.485	0.077	0.894	0.612	0.312	0.911	0.548	0.170
1990:2	3.117	8.696	14.021	19.497	54.669	0.570	0.878	0.486	0.101	0.913	0.624	0.313	0.911	0.566	0.172
1990:3	3.179	8.343	13.693	19.910	54.870	0.575	0.897	0.489	0.148	0.900	0.626	0.293	0.908	0.574	0.193
1990:4	3.466	8.658	13.552	19.317	55.007	0.569	0.847	0.522	0.113	0.859	0.576	0.346	0.868	0.569	0.195
1991:1	3.298	8.277	13.338	18.843	56.238	0.582	0.900	0.521	0.114	0.901	0.598	0.338	0.908	0.563	0.195
1991:2	3.059	8.078	13.172	18.935	56.755	0.591	0.882	0.504	0.105	0.919	0.625	0.305	0.905	0.577	0.178
1991:3	2.684	7.729	12.857	18.950	57.780	0.607	0.866	0.466	0.127	0.920	0.622	0.306	0.902	0.552	0.198
1991:4	3.159	8.207	12.871	18.793	56.971	0.591	0.835	0.573	0.122	0.836	0.607	0.305	0.844	0.594	0.210
1992:1	2.714	7.115	11.900	17.516	60.745	0.632	0.917	0.513	0.087	0.952	0.600	0.341	0.937	0.572	0.191
1992:2	2.630	7.462	12.613	19.045	58.250	0.614	0.912	0.513	0.086	0.943	0.615	0.338	0.929	0.565	0.183
1992:3	2.581	7.744	12.801	18.798	58.057	0.610	0.884	0.493	0.080	0.944	0.639	0.314	0.915	0.566	0.187
1992:4	2.817	7.459	11.560	17.089	61.065	0.631	0.832	0.507	0.101	0.882	0.627	0.316	0.864	0.575	0.180
1993:1	2.767	7.954	12.685	18.763	57.831	0.605	0.918	0.557	0.096	0.949	0.605	0.348	0.927	0.581	0.197
1993:2	2.836	7.719	12.500	18.484	58.451	0.610	0.893	0.527	0.091	0.948	0.633	0.329	0.917	0.591	0.189
1993:3	2.562	7.240	12.263	18.333	59.603	0.626	0.908	0.515	0.096	0.940	0.604	0.333	0.928	0.569	0.204
1993:4	2.695	7.183	10.509	16.743	62.869	0.650	0.876	0.538	0.102	0.927	0.590	0.353	0.898	0.582	0.201
1994:1	2.546	7.102	11.079	17.761	61.500	0.643	0.915	0.552	0.120	0.941	0.584	0.349	0.929	0.591	0.207
1994:2	2.841	7.566	11.609	18.885	59.100	0.619	0.913	0.538	0.082	0.946	0.619	0.323	0.930	0.586	0.193
1994:3	2.666	7.566	11.350	18.858	59.559	0.625	0.910	0.544	0.113	0.940	0.591	0.354	0.932	0.584	0.209
1994:4	2.707	7.480	11.270	18.519	60.012	0.628	0.899	0.525	0.093	0.925	0.626	0.351	0.907	0.595	0.210
1995:1	3.006	8.053	12.163	18.843	57.929	0.603	0.918	0.527	0.126	0.949	0.639	0.357	0.935	0.595	0.212
1995:2	2.567	7.334	11.303	18.105	60.682	0.635	0.919	0.556	0.113	0.958	0.603	0.365	0.941	0.602	0.216
1995:3	2.659	7.062	11.270	17.938	61.067	0.639	0.896	0.551	0.109	0.971	0.625	0.375	0.931	0.590	0.222
1995:4	2.815	7.693	11.477	18.728	59.282	0.620	0.912	0.560	0.106	0.953	0.660	0.346	0.927	0.612	0.207
1996:1	2.881	7.765	12.536	19.068	57.737	0.605	0.938	0.556	0.100	0.960	0.624	0.360	0.944	0.592	0.213
1996:2	2.707	7.550	11.909	18.723	59.108	0.620	0.911	0.567	0.138	0.958	0.652	0.401	0.931	0.614	0.231