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MONETARY POLICY AND THE WELL-BEING OF THE POOR

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ABSTRACT

This paper investigates monetary policy's influence on poverty and inequality in both the short run and the long run. We find that the short-run and long-run relationships go in opposite directions. The time-series evidence from the United States shows that a cyclical boom created by expansionary monetary policy is associated with improved conditions for the poor in the short run. The cross-section evidence from a large sample of countries, however, shows that low inflation and stable aggregate demand growth are associated with improved well-being of the poor in the long run. Both the short-run and long-run relationships are quantitatively large, statistically significant, and robust. But because the cyclical effects of monetary policy are inherently temporary, we conclude that monetary policy that aims at low inflation and stable aggregate demand is the most likely to permanently improve conditions for the poor.

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Poverty is arguably the most pressing economic problem of our time. And because rising inequality, for a given level of income, leads to greater poverty, the distribution of income is also a central concern. At the same time, monetary policy is one of the modern age's most potent tools for managing the economy. Given the importance of poverty and the influence of monetary policy, it is natural to ask if monetary policy can be used as a tool to help the poor.

It is this possibility that we pursue in this paper. We examine the influence of monetary policy on poverty and inequality both over the business cycle in the United States and over the longer run in a large sample of countries. Our analysis suggests that there are indeed important links between monetary policy and the well-being of the poor in both the short run and the long run, but that the short-run and long-run relationships go in opposite directions. Expansionary monetary policy aimed at rapid output growth is associated with improved conditions for the poor in the short run, but prudent monetary policy aimed at low inflation and steady output growth is associated with enhanced well-being of the poor in the long run.

The existing literature on monetary policy and the poor focuses almost exclusively on the short run. Monetary policy can affect output, unemployment, and inflation in the short run. As a result, if poverty and inequality respond to these variables, monetary policy can affect the well-being of the poor. Furthermore,

because unanticipated inflation can redistribute wealth from creditors to debtors, monetary policy can also affect distribution through this channel.

In the first section of the paper, we provide some up-to-date estimates of the cyclical behavior of poverty and inequality. We confirm the common finding that poverty falls when unemployment falls. In contrast to earlier authors, however, we find no evidence of important effects of cyclical movements in unemployment on the distribution of income. We find some evidence that unanticipated inflation narrows the income distribution, though we can detect no noticeable impact on poverty. Finally, using the Federal Reserve's Survey of Consumer Finances, we find that the potential redistributive effects of unanticipated inflation on the poor through capital gains and losses are very small.

Because of the short-run cyclicality of poverty, some authors have concluded that compassionate monetary policy is loose or expansionary policy. We, however, argue that this view misses the crucial fact that the cyclical effects of monetary policy on unemployment are inherently temporary. Monetary policy can generate a temporary boom, and hence a temporary reduction in poverty. But, as unemployment returns to the natural rate, poverty rises again. Furthermore, the expansionary policy generates inflation. If a monetary contraction is used to reduce inflation, the negative effects on poverty offset even the temporary reduction in poverty during the earlier boom.

In the long run, monetary policy most directly affects average inflation and the variability of aggregate demand. Therefore, the important question from the

perspective of monetary policymakers concerned with the condition of the poor is whether there is a link between these variables and poverty and inequality. We investigate such long-run relationships in the second section of the paper.

We use data for a large sample of countries from the 1970s and 1980s to see if there is a systematic relationship between poverty and the variables directly affected by monetary policy in the long run. We find that there are indeed important negative relationships between the income of the poor and both average inflation and macroeconomic instability. These relationships are quantitatively large and robust to permutations in samples and control variables.

Looking at the components behind the reduced-form correlations provides insight into the source of these relationships. Our own estimates and those in the literature suggest that high inflation and macroeconomic instability are correlated both with less rapid growth of average income and with lower equality. We also find that it is primarily the long-run link between monetary policy and the behavior of average income that is driving the negative correlations of both inflation and variability with poverty.

Researchers and policymakers should obviously interpret correlations such as the ones we report with caution. They could, for example, result from some third factor, such as education or government effectiveness, that affects both poverty and monetary policy. Nevertheless, they are certainly consistent with the notion that controlling inflation and output variability through sound monetary policy is likely to result in higher income for those at the bottom of the distribution in the long run. For

this reason, we conclude that compassionate monetary policy is, most likely, simply sound monetary policy. Monetary policy that aims to restrain inflation and minimize output fluctuations is the most likely to permanently improve conditions for the poor.

I. EFFECTS OF MONETARY POLICY ON THE POOR IN THE SHORT RUN

A. The Channels through Which Monetary Policy Affects the Poor

Expansionary monetary policy raises both output and inflation in the short run. These short-run effects of monetary policy can influence the well-being of the poor through three channels.

First, and most importantly, the rise in average income in a cyclical expansion directly reduces poverty. For a given distribution of income around its mean, an increase in the mean reduces the number of people below a fixed cutoff. That is, a rise in all incomes together increases the incomes of the poor, and raises some of their incomes above the poverty level. Since expansionary monetary policy raises average income in the short run, this is a powerful mechanism through which monetary policy can immediately benefit the poor.

Second, there may be cyclical changes in the distribution of income. The declines in unemployment and increases in labor force participation and in real wages in an expansion are likely to be concentrated disproportionately among low-skilled workers. Thus the income distribution may narrow. In this case, there are short-run

benefits of expansionary policy to the poor beyond its effect on average income. On the other hand, transfers are less cyclical than labor income, and the poor receive a larger fraction of their income from transfers than do the remainder of the population. If this effect predominates, the income distribution could widen in a boom. In this case, the benefits of expansionary policy to the poor are smaller than what one would expect given the impact on mean income.

Third, the inflation created by expansionary monetary policy has distributional effects. Inflation can harm the poor by reducing the real value of wages and transfers. For example, the fact that real welfare benefits fell in the 1970s may have been partly due to inflation. The pension income of the poor, on the other hand, is insulated from inflation: well over ninety percent of the pension income of the elderly poor comes from social security, which is indexed (U.S. House of Representatives, 1996, Table A-10). Finally, unanticipated inflation benefits nominal debtors at the expense of nominal creditors. If the poor are net nominal debtors, inflation can help them through this channel.

With these general considerations in mind, we turn to the empirical evidence to examine the impact of cyclical fluctuations and inflation on poverty. We also examine these variables' impact on the distribution of income. Our approach follows such authors as Blinder and Esaki (1978), Blank and Blinder (1986), Cutler and Katz (1991), Blank (1993), and Blank and Card (1993). We differ from these authors in focusing on the absolute rather than the relative well-being of the poor, in emphasizing the distinction between unanticipated and anticipated inflation, and in considering more

recent data.

Because the income measures that we examine do not include capital gains and losses, these data may miss some of the short-run effects of monetary policy on the poor. Therefore, after examining the impact of unemployment and inflation on poverty and income distribution, we examine the financial balance sheets of the poor to see if unanticipated inflation is likely to have any substantial effect on them through this channel.

B. Poverty and the Macroeconomy

We examine the relationship of poverty with unemployment and inflation in the postwar United States. Because data on poverty and income distribution are only available annually, we use annual data throughout. Our basic sample period is 1969-1994; this is the longest period for which all of the series we use are available. Our dependent variable is the poverty rate -- that is, the fraction of the population living in households with incomes below the poverty level. We use the unemployment rate for men aged 20 and over as our cyclical indicator; for simplicity, we refer to this as "unemployment" in what follows. Our measure of inflation in year t is the change in the logarithm of the GNP deflator from the fourth quarter of year t-1 to the fourth quarter of year t. To separate inflation into its anticipated and unanticipated components, we use the inflation forecasts from the Survey of Professional Forecasters (formerly the ASA/NBER survey). Specifically, our measure of expected inflation in year t is the median forecast in November of year t-1 of inflation over the next four

quarters.

Charts 1 through 3 show the basic relationships. Chart 1 is a scatter plot of the change in the poverty rate against the change in unemployment. There is a strong positive relationship. That is, increases in unemployment are associated with increases in poverty. Charts 2 and 3 are scatter plots of the change in poverty against the unanticipated change and the anticipated change in inflation, respectively. Chart 2 shows no clear relationship between changes in poverty and unanticipated inflation. Chart 3, on the other hand, shows a moderate tendency for poverty to fall when there are anticipated increases in inflation.

The corresponding regressions are reported in the first three columns of Table 1. The regression of the change in the poverty rate on the change in unemployment yields a t-statistic of almost seven. The point estimate implies that a rise in unemployment of one percentage point is associated with a rise in the poverty rate of 0.4 percentage points. The regression of the change in poverty on the unanticipated change in inflation produces a coefficient that is small and insignificant. Finally, the relationship between the change in poverty and the anticipated change in inflation is close to significant. The point estimate implies that an anticipated increase in inflation of one percentage point is associated with a decline in poverty of 0.2 percentage points.

Column 4 considers all three variables together. In addition, because poverty fell on average less rapidly in the 1980s and 1990s than in earlier decades, this specification includes a trend. As before, there is a quantitatively large and

overwhelmingly statistically significant relationship between unemployment and poverty. The point estimate on the change unemployment is similar to that in the univariate regression. The estimated coefficient on the unanticipated change in inflation continues to be small and statistically insignificant. The one important change is that the coefficient on the anticipated change in inflation is now close to zero and not at all significant. That is, the multivariate regression suggests a strong relationship between unemployment and poverty, and essentially no relationship between inflation and poverty.

The reason the univariate and multivariate specifications yield different results for anticipated inflation is that anticipated increases in inflation are correlated with falls in unemployment. When the change in unemployment is omitted from the regression, the anticipated change in inflation serves as a noisy proxy for this variable. The result is a modest negative coefficient. But when the change in unemployment is included, the negative coefficient on the anticipated change in inflation disappears. That is, there is no evidence of a direct impact of anticipated inflation on poverty.

Poverty has fallen relatively little since 1985 despite the large fall in unemployment. Blank (1993) therefore suggests that cyclical expansions may have a smaller impact on poverty today than in the past. To explore this possibility, we reestimate the regression in Column 4 allowing the constant term and the coefficient on the change in unemployment to take on different values beginning in 1983 (the date suggested by Blank). This exercise provides no support for Blank's suggestion. The point estimates of unemployment's impact on poverty for the two periods are

essentially identical (0.479 versus 0.475), and the t-statistic for the null hypothesis that the effect has not changed is virtually zero (0.04). That is, the reason that poverty has not fallen greatly in the past fifteen years is not that cyclical expansions are much less effective in reducing poverty than before, but that other forces -- most obviously the rise in inequality -- have roughly offset the effects of the large fall in unemployment.[1]

C. Income Distribution and the Macroeconomy

Cyclical fluctuations clearly affect poverty through their impact on average income. But they may also affect poverty by changing the distribution of income around its mean. To investigate this possibility, we consider the relationship between income distribution and macroeconomic performance.

We consider three measures of income distribution: the Gini coefficient for family incomes, the fraction of income going to the poorest fifth of families, and the fraction of income going to the poorest fifth of households. The last two measures

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[1] We have investigated the robustness of our findings along a large number of dimensions: omitting the trend; including lagged as well as contemporaneous changes in unemployment and inflation; considering longer sample periods (which requires us to not distinguish between anticipated and unanticipated inflation); allowing the effects of inflation as well as unemployment to change in 1983; and estimating the regressions in levels rather than changes (and including the lagged dependent variable on the right-hand side). In all cases, the qualitative picture is the same: there is a strong relationship between unemployment and poverty, and no clear relationship between inflation and poverty. In two of the variants (omitting the trend and including lags), there is a modest tendency for increases in inflation to be associated with increases in poverty. But the coefficients on inflation are never significantly different from zero.

differ only in the population they consider: the family-based measure is based on groups of two or more individuals living together related by blood or marriage, while the household-based measure is based on all individuals.

For simplicity, we focus on the specification like that in our multivariate regression in Table 1. That is, we regress the change in the relevant measure of income distribution on a constant, the change in unemployment, the unanticipated and anticipated changes in inflation, and a trend.

Table 2 reports the results. The point estimates suggest that unemployment has little impact on income distribution. The estimated impact of unemployment on the Gini coefficient is close to zero and highly insignificant. For the share of income going to the poorest fifth of families, a one-percentage-point rise in the unemployment rate is associated with a fall in the poor's income share of 0.05 percentage points. This estimate is marginally significant, but quantitatively small. For example, this group's income share fell by 1.4 percentage points from its peak in 1969 to 1994. And when we consider the income share of the poorest fifth of households rather than the poorest fifth of families, the estimates imply that an increase in unemployment is associated with a slight rise in the poor's income share.

While unemployment appears to have no noticeable effect on distribution, the results do suggest that inflation may narrow the income distribution slightly. The estimates imply that unanticipated inflation is associated with a higher income share of the poor (by either measure) and with a lower Gini coefficient. However, only the correlation between inflation and the income share of the poorest fifth of households is

statistically significant. And even in that case, the omission of a single year (1974) reduces the t-statistic to 1.5. More importantly, the estimated coefficients are small. For example, the point estimate implies that one percentage point of unanticipated inflation is associated with a fall in the Gini coefficient (measured on a scale of 0 to 100) of just 0.10. For comparison, the rise in the Gini coefficient from 1969 to 1994 was 7.70. Finally, the point estimates for changes in anticipated inflation are similar to those for unanticipated inflation. The coefficients are estimated less precisely, however.[2]

D. Previous Studies

Various other authors have examined the impact of macroeconomic performance on poverty and income distribution using U.S. time-series data. Essentially everyone who has examined the issue has found, as we do, that economic expansions reduce poverty (see, for example, Anderson, 1964; Perl and Solnick, 1971; and Blank, 1993). And the results of Blinder and Esaki (1978), Blank and Blinder (1986), and Cutler and Katz (1991) are consistent with our finding that inflation leaves the income distribution essentially unchanged or causes it to narrow slightly.

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[2] We have investigated the robustness of the results for the distribution of income along the same dimensions that we examined the results for poverty. These results support our findings that unemployment has no systematic impact on the distribution of income, and that inflation may narrow it slightly. We also find no evidence of a change in the effects of unemployment or inflation in 1983.

Previous work has found a stronger impact of unemployment on income distribution than our results suggest (Metcalf, 1969; Blinder and Esaki, 1978; Blank and Blinder, 1986; Cutler and Katz, 1991; and Castañeda, Díaz-Giménez, and Ríos-Rull, 1998). For example, Blank and Blinder find that a one-percentage-point rise in unemployment is associated with a fall in the income share of the poorest fifth of families of 0.19 percentage points. For comparison, our point estimate is a fall of 0.05 percentage points (and a rise of 0.02 percentage points for the poorest fifth of households). The key to the difference is the sample periods: increases in unemployment are associated with widening of the income distribution in the 1950s and 1960s, but with essentially no change in the 1970s and 1980s. Previous work examines earlier sample periods. Blank and Blinder, for example, consider 1948-1983, and Castañeda, Díaz-Giménez, and Ríos-Rull consider 1948-1986. As a result, these papers find a relationship between unemployment and the distribution of income. But that relationship is largely absent when more recent data are analyzed.

There are two other important types of evidence concerning economic aggregates and the welfare of the poor in addition to the U.S. time-series evidence. The first is the U.S. regional evidence examined by Blank and Card (1993). Blank and Card investigate the relationship between regional poverty rates and measures of overall economic activity. They focus on time-series cross-section regressions that include both year and region dummies; thus they do not use either the aggregate time-series variation or the overall cross-region variation in their estimation. Their findings provide further support for the proposition that increases in overall economic activity

reduce poverty. For example, they estimate that a one-percentage-point fall in a region's unemployment rate is associated with a reduction in the poverty rate of 0.28 percentage points. And they find, as we do, no discernable change over time on the impact of economic activity on poverty.

Blank and Card also find little impact of overall activity on income distribution. For their baseline specification, they find that a change in a region's unemployment rate has virtually no impact on the poor's income share. When they include control variables or use the growth of median income rather than unemployment as their cyclical indicator, they find that economic expansions cause a slight rise in the poor's share. These weak effects arise from a combination of two offsetting forces: the poor's labor earnings are much more responsive than other groups' to overall activity, but labor earnings are a considerably smaller fraction of their income.

The second kind of additional evidence is that from other countries. Guitián (1998) reports time-series estimates of inflation's impact on the poor's income share for ten countries. The estimated effect is positive in four cases and negative in six, and in most cases it is not clearly significantly different from zero. Thus again there is no evidence of an important systematic short-run effect of inflation on income distribution.

E. Inflation and the Balance Sheets of the Poor

One of the most commonly cited effects of inflation is that it causes redistributions from creditors to debtors. Unanticipated inflation reduces the real

value of nominal assets and liabilities. It therefore causes real capital losses for nominal creditors, and real capital gains for nominal debtors. If the poor are net nominal debtors, these effects on net benefit them.

The income measures we consider above do not include any capital gains and losses. To investigate inflation's impact on the poor's balance sheets, we therefore examine the balance sheet data from the Federal Reserve's 1995 Survey of Consumer Finances. (These data are available on-line from the Board of Governors of the Federal Reserve System.) Specifically, we examine the financial assets and liabilities of the poor to see if they are likely to be affected substantially by unanticipated inflation.

We focus on the quintile reporting the lowest total income. Some households in this group, however, cannot reasonably be considered poor. For example, some have very high wealth but low or negative income for the survey year because of large losses from their businesses. Since some of these households have extremely high assets and liabilities, classifying them as poor would distort the averages severely. We therefore exclude households with net worth over $100,000. These are households whose net worth puts them in the top 36% of the population as a whole. This criterion eliminates about 12% of the low income households from our sample.

Table 3 summarizes the financial balance sheets of this group. We divide financial assets into three categories: transactions accounts, whole life insurance, and

other financial assets.[3] We divide financial liabilities into four categories: real estate debt, credit card balances, installment debt, and other liabilities.

The data confirm the conventional view that the poor are nominal debtors. The average poor household has $3385 of financial assets and $5201 of debts, and thus has negative financial net worth. And most of the poor's debts are medium and long term: the two most important categories of debt are real estate and installment debt.

But the more important message of Table 3 is that the potential redistributive effects of unanticipated inflation on the poor through capital gains and losses are small. This is true in two senses. First, the mean levels of financial assets and liabilities among the poor are too small to be greatly affected by inflation. A back of the envelope calculation demonstrates this. Shiller (1997) reports that the standard deviation of the 10-year inflation rate for the postwar United States is 32 percentage points. Suppose then that inflation over a ten-year period is 32 percentage points higher than anticipated. In addition, suppose that the real value of the poor's financial assets is fully insulated from this inflation, while the real value of their debts falls by half the amount of the unexpected inflation; that is, suppose that the real value of their debts falls by 16 percent. These assumptions surely understate the impact of inflation on the poor's assets, and almost surely overstate the impact on their debts. With these assumptions, the inflation causes a real capital gain to the average poor household of

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[3] The two most important components of our other financial assets category are certificates of deposit and the survey's residual category (which includes loans, future proceeds, royalties, futures, non-public stock, deferred compensation, oil/gas/mineral investment, cash not elsewhere classified).

about $800 over the ten-year period, or about $80 per year. For comparison, average annual income in this group is $6882. Thus, even this generous calculation of the redistributive benefits of inflation to the poor does not yield a large estimate.

Second, the vast majority of the poor have very few financial assets and liabilities at all. For example, 56% have less than $500 of all financial assets, and 76% have less than $500 of financial assets other than transactions accounts. Similarly, 61% have liabilities of less than $500, and 89% have no real estate debt (which is the only category that includes any substantial long-term debt). More generally, the average levels of assets and liabilities cited above are driven by a small number of households. Average debts excluding the 10% of the poor with the highest debts are just $1372, and average financial assets excluding the 10% with the highest financial assets are just $1070. Thus for the vast majority of the poor, the potential redistributive effects of inflation are much smaller than the already low figure computed above.. We conclude that the traditional redistributive effects of unanticipated inflation are of little importance for the poor.

F. Implications

Although the cyclical behavior of poverty and income distribution is interesting, it is in fact of little relevance to monetary policy. The reason is simple and well known: monetary policy cannot cause a permanent boom.

To see the difficulty facing monetary policymakers who are concerned about the poor, suppose that output and unemployment are at their normal or natural levels,

and that policymakers undertake expansionary policy. The result is a period of below-normal unemployment and above-normal output. This cyclical expansion raises the incomes of the poor and lowers the poverty rate.

To gauge the possible size of this effect on poverty, consider an expansionary monetary policy that reduces the unemployment rate from the natural rate to two points below and keeps it low for two years. Based on the estimates in Table 1 (column 4), such a reduction would lower the poverty rate by almost exactly one percentage point the first year and keep it at that level the second year. Since a reduction in the poverty rate of one percentage point is substantial, such a policy would clearly benefit the poor in the short run.

But the boom cannot last. Monetary policy can push unemployment below normal and output above normal only temporarily. The low unemployment and high output cause inflation to rise. For example, using the usual rule of thumb that unemployment one percentage point below the natural rate for a year raises the inflation rate by one-half of a percentage point, the two-year, two-percentage-point reduction in unemployment described above would lead to inflation that is two percentage points higher than before. Output and unemployment, however, inevitably return to their normal levels. When this happens, poverty returns to its initial level. Even if policymakers are willing to tolerate the higher inflation, all the expansionary policy has achieved is a temporary period of below-normal poverty at the cost of permanently higher inflation.

A more likely outcome is that policymakers will choose not to accept the higher

inflation. In this case, they will adopt contractionary policies to bring inflation back to its initial level. The result is a period of below-normal output and above-normal unemployment and poverty. In this case, policy has had no impact on the average level of poverty; it has only rearranged its timing.

In addition, some recent evidence suggests that the output-inflation tradeoff is asymmetric: above-normal output causes inflation to rise more rapidly than the same amount of below-normal output causes it to fall (Clark, Laxton, and Rose, 1996, and Debelle and Laxton, 1997). In this case, the contraction needed to decrease inflation is larger than the expansion that increased it, and so the boom-bust cycle raises average poverty.

We have described the dilemma facing compassionate policymakers in terms of the decision of whether to undertake expansionary policy in an economy operating at normal capacity. But the problem is general. Suppose, for example, that concern about the poor causes monetary policymakers to err on the side of preventing recessions. Such a policy results in output being above normal more often than it is below normal. Since above-normal output raises inflation and below-normal output lowers it, the result is that inflation is on average rising. But then policymakers are in the same position as before. At some point they must switch to a policy of keeping output on average equal to normal. Thus a policy of erring against contraction can produce at most a temporary period of below-normal poverty. And in the more likely case where policymakers eventually decide to reverse the rise in inflation, the policy does not succeed in lowering average poverty at all.

In summary, the cyclical aspects of poverty are not central to the question of how concern about poverty and income distribution should affect monetary policy. Monetary policy cannot permanently reduce poverty and inequality by creating booms or preventing recessions.

II. EFFECTS OF MONETARY POLICY ON THE POOR IN THE LONG RUN

A. The Channels through Which Monetary Policy Affects the Poor

What monetary policy can control in the long run is average inflation and the variability of aggregate demand. These can affect the well-being of the poor both by influencing long-run growth and by influencing the distribution of income.

High inflation creates uncertainty, generates expectations of future macroeconomic instability and distortionary policies, disrupts financial markets, and creates high effective tax rates on capital. It thereby discourages investment of all types: physical capital accumulation, human capital accumulation, innovation and research and development, and foreign direct investment and technology transfer. As a result, it can retard growth. Because macroeconomic instability is also likely to discourage investment, it can have similar effects. Furthermore, to the extent that high inflation and high variability generate uncertainty about the return to productive activities and increase the scope for activities that are privately but not socially beneficial, they may lower work effort and lead to rent-seeking. This can also erode a

country's average standard of living.

High inflation and macroeconomic volatility can also affect the poor through the distribution of income around its average. There are at least five channels through which monetary policy can affect long-run income distribution. First, the redistributions caused by swings in unanticipated inflation directly raise inequality. Second, the reductions in physical capital investment caused by uncertainty and financial-market disruptions raise the average return on capital and depress wages; thus they widen the income distribution. Third, offsetting this, inflation may shift the burden of taxation away from labor and toward capital. Fourth, the uncertainty and reduced effectiveness of financial markets caused by inflation and macroeconomic instability reduce not just physical capital investment, but human capital investment. This thwarts an important mechanism by which inequality can be mitigated. And finally, inflation and macroeconomic volatility may harm some sectors of the economy disproportionately. For example, they may be particularly harmful to simple manufacturing or export-oriented industries. Depending on the relative position of the workers in these industries, this can either increase or decrease inequality.

To investigate how inflation and macroeconomic instability affect the poor, we examine the cross-country relationship between these variables and the poor's standards of living. Because the effects of inflation and volatility are likely to be gradual and cumulative, little can be learned from looking at variation over time within a country. Across countries, in contrast, there is a great deal of variation in the long-term performance of monetary policy. Thus the cross-country evidence has

the greatest potential to be instructive.

We begin by examining the relationship between the long-run performance of monetary policy and the overall well-being of the poor. We then turn to monetary policy's relationship with the two determinants of that overall well-being, the average income of the population as a whole and the distribution of income.

As is well-known, cross-country regressions must be interpreted with caution. There are inevitably a host of important omitted factors, and the search for useful instruments for macroeconomic variables has had little success. Thus such regressions can show only correlations, not causation. Nonetheless, we think it is useful to ask how the poorest segment of society fares in countries where monetary policy has kept inflation low and demand stable relative to countries where policy has produced high inflation and unstable demand.

B. Data

The key variable in our analysis is the average income of the poorest quintile of a country's population. We derive this measure by multiplying the average real income in each country times the share of income going to the poorest fifth of the population, times five.

The data on the income share of the poorest fifth of the population come from the comprehensive data base on inequality assembled by Deininger and Squire (1996). This data base is the result of a careful and exhaustive search of country-level inequality data. We restrict our attention to data that meet Deininger and Squire's

criteria for high quality: the data must be based on household surveys and have comprehensive coverage of the population and of income sources. Deininger and Squire are also the source of the data on the Gini coefficient that we analyze later.[4]

Our empirical work focuses on data for 1988. We choose this date on the basis of data availability: using more recent data requires large reductions in the sample. Inequality and poverty evolve sufficiently slowly, however, that it is unlikely that the specific year we consider is crucial to the results. Thus our share data are for 1988 whenever possible. If no data are available for a country for that year, we use as close a year as possible, but in any event not before 1983 or after 1993.

The data on average real income per person are from Summers and Heston's well-known data set. These data are described by Summers and Heston (1991). Updated versions are available on-line from the National Bureau of Economic Research; we use Mark 5.6 of the data. All of the real income data are for 1988.

As described above, we focus on two indicators of the long-run performance of monetary policy: average inflation and the variability of aggregate demand. We measure inflation as the average change in the logarithm of the GDP deflator over the period 1970-1990, and demand variability as the standard deviation of the change in the logarithm of nominal GDP over the same period. These data are from the World

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[4] As Deininger and Squire describe, the inequality measures for some countries are based on spending rather than income. We adjust these observations as suggested by Deininger and Squire to make them comparable to the income-based measures. Specifically, we add 6.6 points to the spending-based Gini coefficients, and we subtract 1.2 percentage points from the spending-based figures for the share of the poorest fifth of the population.

Bank's World Data CD-ROM (1995 edition).

We consider two basic samples. The first consists of all countries for which we can obtain data. This sample consists of 66 countries when we analyze the average income of the poor. The second sample consists of industrialized countries. Specifically, we consider the countries that were in the OECD as of 1973. This is a simple way of excluding the less industrialized countries that have joined the OECD in the past few years (the Czech Republic, Hungary, Korea, Mexico, and Poland). This sample has 19 countries when we analyze the average income of the poor.

C. Monetary Policy and the Well-Being of the Poor

Chart 4 is a scatter plot of the logarithm of the average income of the poorest fifth of the population against average inflation. Chart 5 replaces average inflation with demand variability. Both plots suggest a negative relationship: the average income of the poor tends to be lower in countries where monetary policy has produced higher average inflation and greater macroeconomic volatility. Both charts also show that there are a handful of outliers that are likely to be important to any estimated relationship. Charts 6 and 7 therefore repeat Charts 4 and 5 without the outliers. Specifically, we omit countries with average inflation above 25% from Chart 6, and countries with a standard deviation of nominal GDP growth above 30% from Chart 7. Again, both plots suggest negative relationships.

Table 4 reports regression results. Column 1 is a regression of the logarithm of the average income of the poor on a constant and average inflation; thus it is the

regression corresponding to Chart 4. The point estimate implies that a one-percentage-point rise in average inflation is associated with a reduction in the poor's average income of about one and a half percent. Thus, a country with inflation that is one standard deviation (18.5 percentage points) above the mean is predicted to have average income of the poorest quintile that is 25.6 percent below the mean. That is, it suggests a quantitatively important relationship. The relationship is not estimated very precisely, however. For example, the null hypothesis of no association is only moderately rejected.

Column 2 considers demand variability rather than average inflation; thus it corresponds to Chart 5. Again the point estimate implies a large relationship. A one-percentage-point rise in the standard deviation of nominal GDP growth is associated with a one-percentage-point fall in the poor's average income. This implies that country with demand variability one standard deviation (26.7 percentage points) above the mean is predicted to have average income of the poorest quintile 28.6 percent below the mean. But again the estimate is imprecise.

Columns 3 and 4 exclude the outliers; thus they correspond to Charts 6 and 7. The point estimates rise sharply. They now imply that a one-percentage-point rise in average inflation is associated with a fall in the poor's income of nine percent, and that a one-percentage-point rise in the standard deviation of nominal GDP growth is associated with a fall of eleven percent. That is, the results suggest that the relationship between the long-run performance of monetary policy and the poor's well-being is greater at low levels of average inflation and demand variability. As a result,

even though the standard deviations of both inflation and variability are much smaller in the reduced samples, a country with inflation one standard deviation (4.0 percentage points) above the mean is predicted to have average income of the poorest quintile 34.4 percent below the mean, and a country with demand variability one standard deviation (5.0 percentage points) above the mean is predicted to have average income of the poor 55.4 percent below the mean. Excluding the outliers greatly increases the estimated coefficients' standard errors, however. As a result, the coefficient on average inflation is still only marginally significant. But despite the rise in the standard errors, the coefficient on demand variability is now highly significant.

Average inflation and the standard deviation of nominal GDP growth are highly correlated. In the full sample of 66 countries for which we have average income for the poorest quintile, for example, their correlation is 0.94. As a result, the data are not able to distinguish the relationship of the poor's average income with average inflation from its relationship with demand variability. Column 5 shows the results of including both variables in the regression. The standard errors of both coefficients are large, and neither is close to statistically significant.

As described above, these simple cross-country regressions leave out many other factors that influence the incomes of the poor, and these omitted factors may be correlated with the long-run performance of monetary policy. One way to address this problem is to add dummy variables for different regions to the regressions. There may be important differences across parts of the world in such factors as the quality of institutions and cultural attitudes toward thrift and entrepreneurship. By including

regional dummies, we can eliminate the possibility that such differences are the source of our results. At the same time, including the dummies has the disadvantage that we no longer use the large cross-region variation in the long-run performance of monetary policy to estimate the coefficients of interest.

Table 5 reports the results of reestimating the regressions in Table 4 with a dummy variable for each continent.[5] The addition of the continent dummies does not change the basic character of the results. For the full-sample regressions (Columns 1 and 2), the main effect of including the dummies is to reduce the standard errors of the coefficients on the monetary-policy variables slightly. For the regressions excluding the outliers (Columns 3 and 4), including the dummies reduces the point estimates considerably. They are, nevertheless, still quite large: for both average inflation and variability, a country that has a value for the independent variable one standard deviation above the mean is still predicted to have average income of the lowest quintile roughly 20 percent below the mean. The coefficient on demand variability, however, is no longer clearly significant. And when we include both average inflation and demand variability (Column 5), we again find that neither coefficient can be estimated with any precision.

Table 6 reports the results for the traditional OECD. Again outliers are an important concern: Turkey is by far the poorest country in this sample, and has by far the highest inflation and the most volatile demand. Thus we report the results both

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[5] We use Summers and Heston's definitions of the continents.

with and without Turkey.

The regressions show that among industrialized countries, there is a powerful relationship between average inflation and the well-being of the poor. For the full sample, the point estimate is that a one-percentage-point rise in average inflation is associated with a fall in the poor's average income of seven percent. Thus, a country with inflation one standard deviation (6.3 percentage points) above the mean for industrialized countries is predicted to have average income for the poorest quintile 42.6 percent below the mean. The null hypothesis of no relationship is overwhelmingly rejected. When Turkey is excluded, the point estimate is even larger. It is not as precisely estimated as before, but is still highly significant.

The relationship between demand variability and the income of the poor in industrialized countries, on the other hand, is not clear. When Turkey is included, there is a large and highly significant negative association. When Turkey is omitted, however, the relationship is estimated so imprecisely that a two-standard-deviation confidence interval includes both very large negative and very large positive coefficient values.

For the industrialized countries, in contrast to the full sample, attempting to distinguish the relationship of the poor's incomes with average inflation from its relationship with demand variability produces a clear result: it is average inflation that is associated with the poor's incomes. As Column 5 shows, the point estimate on average inflation is large and highly significant, while the coefficient on demand variability is not estimated with any precision. And excluding Turkey has no

important effect on the estimates or their standard errors.

Charts 8 and 9 show the source of the estimates. Chart 8 shows that there is a strong negative relationship between the poor's average income and average inflation in the industrialized countries either with or without Turkey. Chart 9, on the other hand, shows that there is no clear relationship between the poor's incomes and demand variability in these countries beyond the fact that Turkey has highly volatile demand and particularly low incomes among its poor.

We conclude that the data point to an important relationship between the long-run performance of monetary policy and the well-being of the poor. On average, the poor are much better off in countries where monetary policy has kept inflation low and aggregate demand growth stable.

There are two important caveats to this conclusion, both of which are common to this type of cross-country exercise. First, the estimates are imprecise. For example, although the point estimates imply a large relationship, the data do not provide compelling evidence against the view that there is no systematic relationship between the long-run performance of monetary policy and the poor's incomes. Second, the regressions do not establish causation. There may be omitted variables that are correlated with the performance of monetary policy that are in fact the key determinants of the poor's incomes.

For the conduct of monetary policy, the issue of causation is in fact less important than it appears. High inflation cannot be eliminated in isolation. If there is high inflation because a lack of fiscal discipline or of an effective tax system is leading

the government to rely on money finance, for example, reducing inflation requires eliminating the underlying fiscal problem. More generally, inflation reduction is often part of a comprehensive package of policies involving fiscal discipline, macroeconomic stabilization, and microeconomic liberalization. If the package raises the standards of living of the poor in the long run, the question of whether it was the reduction in inflation or the other policy changes that was key is of secondary importance.

D. Monetary Policy and Average Income

As a matter of definition, the average income of the poor is determined by the average income of the full population and how the poor's incomes compare with that average. Thus, to investigate the relationship between the poor's incomes and monetary policy further, we examine the relationships of average income and of income distribution with monetary policy.

Of these two determinants of the poor's average income, the average income of the full population is by far more important. As described above, the average income of the poorest fifth of the population equals the product of overall average income and the poorest fifth's income share, times 5:

$$\bar{Y}_{POOR} = \bar{Y} * Q * 5, \qquad (1)$$

where $\bar{Y}_{POOR}$ is the poor's average income, $\bar{Y}$ is overall average income, and Q is the

lowest quintile's income share. Thus:

$$\ln \bar{Y}_{POOR} = \ln \bar{Y} + \ln Q + \ln 5. \quad (2)$$

The variance of the logarithm of the poor's average income therefore equals the sum of the variance of the logarithm of overall average income, the variance of the logarithm of the lowest quintile's share, and a covariance term:

$$\text{Var}(\ln \bar{Y}_{POOR}) = \text{Var}(\ln \bar{Y}) + \text{Var}(\ln Q) + 2\text{Cov}(\ln \bar{Y}, \ln Q). \quad (3)$$

Computing the three terms on the right-hand side of equation (3) shows that the large majority of the variation across countries in the poor's average income arises from variation in overall average income. For our full sample of 66 countries, for example, over two-thirds of the variance in $\ln \bar{Y}_{POOR}$ is due to variance in $\bar{Y}$. Less than one-eighth comes from variance in ln Q. The remaining one-fifth comes from the fact that the overall average and the lowest quintile's share are moderately correlated.

Considering the possibilities for changing the poor's average income within a country rather than examining the variation across countries reinforces the view that average income is the prime determinant of the poor's well-being. The cross-country record provides many examples of countries where misguided policies have severely lowered average incomes and of countries where sound policies appear to have

significantly raised average incomes. As Li, Squire, and Zou (1998) show, however, large changes in income distribution within a country are rare. The variation in inequality within countries over time is vastly smaller than the variation across countries, and statistically or quantitatively significant trends in inequality within a country are uncommon.

Thus, for monetary policy to have an important impact on the well-being of the poor in the long run, it must have an important effect on the long-run behavior of average income. This relationship between inflation and average income has been the subject of considerable research (see, for example, Fischer, 1993; Cukierman et al., 1993; Barro, 1996; and Bruno and Easterly, 1998). An examination of these findings provides an important check on our previous findings concerning inflation and poverty. This is especially true because studies of the general inflation-income link can typically analyze much larger samples: many countries that do not keep statistics on poverty or distribution do have income and inflation data.

The basic facts about the relation between inflation and the long-run behavior of average income are similar to those concerning inflation and the incomes of the poor. Lower inflation is on average associated with higher growth, but the data do not allow the relationship to be pinned down with much confidence. Consider, for example, a simple cross-country regression of average annual growth in income per person over the period 1970-1988 on a constant and average inflation over 1970-1990 for the 104 countries for which we can obtain data on both variables. This regression produces a coefficient on average inflation of -0.022, with a t-statistic of 2.2. Thus a country

with average inflation one standard deviation (19.0 percentage points) above average is predicted to have an annual growth rate 0.41 percentage points below average. The findings are robust to the inclusion of continent dummies. Excluding countries with high average inflation raises the point estimate considerably; as in our other regressions, however, it also raises the standard error sharply.

Barro (1996) conducts a more detailed examination of the relationship between the long-run performance of monetary policy and long-run growth. He creates a panel data set of 251 observations by constructing separate observations for the periods 1965-1975, 1975-1985, and 1985-1990 for as many countries as possible. He regresses growth in a country in a given period on its average inflation in the period and a large number of control variables, including measures of physical and human capital accumulation. The inclusion of the controls means that the estimates may understate the effects of inflation. If inflation reduces growth by lowering investment, for example, the estimated coefficient on inflation will not capture this.

Barro's point estimates are very similar to those in our simple cross-section. In his baseline specification, for example, the coefficient on inflation is -0.024. Because of the larger sample and the control variables, however, the standard error is much smaller than in the cross-section. In his basic specification, the t-statistic for the null hypothesis of no relationship is almost five.

Barro reports three other results of interest. First, in his sample it is average inflation and not variability (which he measures as the standard deviation of inflation) that is related to growth. Second, excluding the high-inflation observations has little

impact on the estimates. In that sense, the results do not depend on these observations. But excluding these observations again raises the standard errors greatly. As a result, the null hypothesis of no relationship can no longer be rejected.

Barro's final result concerns causation. He proposes using dummy variables for countries' prior colonial status as instruments for inflation. Former French and British colonies inherited anti-inflationary norms and institutions, including the fixed-exchange rate regimes of France's African colonies and the currency boards of many of Britain's colonies. The former Spanish and Portuguese colonies had no such legacies, and their inflation rates have on average been much higher. Thus, prior colonial status is correlated with inflation. Unfortunately, it may also be correlated with factors other than inflation that influence growth: the different colonizers may have affected future growth in ways other than through their impact on inflation. But Barro argues that it is nonetheless interesting to see how using the measures of prior colonial status as instruments affects the estimated relationship between inflation and growth. The answer is that it increases the relationship slightly. Moreover, these variables are not just proxying for Latin American countries: adding a dummy for these countries to the regression has no great effect.

Cukierman et al. (1993) also propose instruments for inflation. Specifically, they construct two measures of non-independence of the central bank: the fraction of political transitions that are accompanied or quickly followed by replacement of the central bank governor, and the frequency of replacement of the central bank governor in times of political stability. Both measures, like Barro's, are correlated with

inflation. But there are again reasons that they may be correlated with other determinants of growth. For example, they may be higher in countries where political changes are more disruptive or the rule of law is weaker. Nonetheless, the results are instructive: as with Barro's study, moving from ordinary least squares to instrumental variables increases the magnitude of the estimated relationship between inflation and growth.

Thus, the data suggest that higher inflation is associated with lower growth in overall incomes. More importantly, two attempts to tackle the issue of causation find no evidence that this correlation is the result of omitted variables that are correlated with inflation. That is, they find no evidence that the correlation does not reflect an effect of inflation on long-run growth. Since the growth of overall income is the key determinant of the poor's well-being in the long-run, these results corroborate our earlier finding that inflation appears to be detrimental to the average income of the poor.

E. Monetary Policy and Income Distribution

The second determinant of the poor's average income is the distribution of income. As our final step, we therefore examine the relationship between the long-run performance of monetary policy and income distribution. We use the Gini coefficient as our measure of income distribution. Because Gini coefficients are available for slightly more countries than are data on average income of the poor, our primary sample in this analysis includes 76 (rather than 66) countries.

Charts 10-13 show the basic relationships. The first two are scatter plots of the Gini coefficient against average inflation and the standard deviation of nominal GDP growth for all countries for which we have data. The next two exclude the outliers. All four charts suggest positive relationships. That is, the distribution of income is less equal in countries with higher average inflation and greater macroeconomic volatility.

Table 7 reports the basic regressions. Column 1 shows that a one-percentage-point rise in average inflation is associated with a rise in the Gini coefficient of 0.2 points, and that the null hypothesis of no relationship is rejected. This relationship is substantial. For example, a country with average inflation one standard deviation (17 percentage points) above average is predicted to have a Gini coefficient 3.3 points above average. For comparison, the standard deviation of the Gini across our sample of countries is 10.6 points.

Column 2 shows a similar result for volatility. A one-standard-deviation difference between countries in demand variability (2.5 percentage points) is associated with a 2.9-point difference in Gini coefficients, and the null hypothesis of no relationship is rejected.

Omitting the outliers greatly increases both the point estimates and their standard errors. But with the outliers excluded, the variation in the performance of monetary policy across countries is much smaller: the standard deviation across countries of average inflation is now 3.9 percentage points, and that of the standard deviation of nominal GDP growth is now 4.7 percentage points. As a result, the

predicted differences in inequality associated with differences of one standard deviation in average inflation and volatility are roughly the same as before. The estimates imply that a country with average inflation one standard deviation above average has a Gini coefficient 2.5 points above average, and that a country with demand variability one standard deviation above average has a Gini 2.9 points above average. Both estimates are only marginally significant, however. Finally, Column 5 shows that it is again not possible to distinguish separate relationships with average inflation and with demand variability.

The results for inequality, in contrast to those for the poor's average income, are sensitive to the inclusion of continent dummies. This is shown in Table 8. The only statistically significant result is that for the full sample, either excluding or including variability, higher average inflation is associated with greater inequality. All the other estimates are sufficiently imprecise that it is not possible to reject either the hypothesis of no relationship or the hypothesis of a quantitatively important one.

Finally, Table 9 reports the results for the traditional OECD. There is a quantitatively large and statistically significant positive association between inequality and average inflation. This is true regardless of whether Turkey is included in the sample, and regardless of whether the regression also includes variability. For variability, in contrast, only the simple regression for the full sample shows a significant relationship. In the other cases, the estimates are too imprecise to be informative.

We conclude that there is some evidence of an important positive relationship

of inequality with average inflation and demand variability. This finding is consistent with the results of Al-Marhubi (1997). Al-Marhubi finds a positive correlation between inequality and average inflation similar to the one we report in Column 1 of Table 7. He also finds that this result is robust to controlling for political stability, central bank independence, and openness.

Once again, the finding of a correlation does not establish causation. Sachs (1989) argues that inequality arising from sources other than monetary policy leads to distributional conflicts, which in turn lead to fiscal stalemates, macroeconomic instability, and reliance on money finance. Thus our correlations may reflect causation from inequality to monetary policy rather than the reverse. Indeed, Al-Marhubi's regressions have inflation on the left-hand side and inequality on the right.

Even with this important caveat in mind, we believe this analysis of the correlation between inequality and monetary policy provides further corroboration of our key finding. Our analysis shows that low inflation and macroeconomic stability are associated with higher income for the poor. While this correlation is due primarily to the correlation between prudent monetary policy and growth, the link is augmented by the correlation between prudent policy and greater equality.

III. CONCLUSIONS

Deriving implications about the impact of alternative policies from admittedly imperfect regressions is always risky. Nevertheless, we believe two conclusions about

the interaction between monetary policy and the well-being of the poor are warranted.

First, our analysis suggests that the usual emphasis on the short-run effects of monetary policy on poverty is fundamentally misguided. It is certainly true that expansionary policy can generate a boom and reduce poverty temporarily. But the effect is unquestionably just that -- temporary. Monetary policy cannot generate a permanent boom. When output returns to the natural rate, so will the poverty rate. Moreover, the cost of such a boom is that inflation is permanently higher. If the higher inflation creates a consensus for tight policy to reduce inflation, the resultant rise in unemployment leads to a rise in poverty that offsets even the temporary reduction generated by the boom.

Second, the cross-country relationship between monetary policy and poverty suggests that monetary policy that aims at low inflation and stable aggregate demand is the most likely to result in genuinely improved conditions for the poor in the long run. It is, of course, completely possible that the relationship between prudent monetary policy and higher incomes for the poorest quintile that we find is not causal. Nevertheless, we strongly suspect that the typical package of reforms that brings about low inflation and macroeconomic stability will also generate improved conditions for the poor and more rapid growth for all.

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Table 1

Poverty and the Macroeconomy

	(1)	(2)	(3)	(4)
Constant	0.01 (0.15)	0.08 (0.60)	-0.02 (0.16)	-0.79 (1.39)
Change in unemployment	0.44 (6.91)			0.49 (5.71)
Unanticipated change in inflation		-0.04 (0.44)		0.03 (0.52)
Anticipated change in inflation			-0.21 (1.64)	0.05 (0.36)
Trend				0.02 (1.54)
R^2	0.67	0.01	0.10	0.75
S.e.e.	0.37	0.64	0.61	0.35

The dependent variable is the change in the poverty rate. The sample period is 1969-1994. Absolute values of t-statistics are in parentheses.

Table 2

Income Distribution and the Macroeconomy

	(1)	(2)	(3)
	Change in Gini Coefficient	Change in Lowest Quintile's Share (Families)	Change in Lowest Quintile's Share (Households)
Constant	-0.40 (0.43)	-0.09 (0.58)	0.00 (0.04)
Change in unemployment	-0.02 (0.15)	-0.05 (1.99)	0.02 (0.95)
Unanticipated change in inflation	-0.10 (1.12)	0.02 (1.08)	0.03 (2.77)
Anticipated change in inflation	-0.15 (0.62)	-0.01 (0.37)	0.03 (0.81)
Trend	0.02 (0.79)	0.00 (0.21)	-0.00 (0.26)
R^2	0.13	0.29	0.32
S.e.e.	0.57	0.09	0.08

The sample period is 1969-1994. Absolute values of t-statistics are in parentheses.

Table 3

The Financial Balance Sheet of the Poor

	Mean	Fraction with positive amount	Mean excluding top 10%
Assets			
Transactions accounts	$1237	58%	$342
Whole life insurance	729	13	13
Other financial assets	1418	21	89
All financial assets	3385	66	1070
Liabilities			
Real estate debt	2660	11	9
Credit card balances	440	25	67
Installment debt	1590	29	317
Other debt	511	8	0
All debt	5201	50	1372
Financial net worth	-1816		

Table 4

Monetary Policy and the Income of the Poor

	(1)	(2)	(3)	(4)	(5)
Constant	6.93 (34.68)	6.87 (39.97)	7.64 (16.99)	7.62 (27.59)	6.83 (29.73)
Average inflation	-1.38 (1.68)		-8.58 (2.05)		0.57 (0.24)
Standard deviation of nominal GDP growth		-1.07 (1.89)		-11.18 (3.70)	-1.44 (0.87)
Outliers excluded?	No	No	Yes	Yes	No
Sample size	66	66	58	61	66
R^2	0.04	0.05	0.07	0.19	0.05
S.e.e.	1.23	1.22	1.26	1.16	1.23

The dependent variable is the logarithm of the average income of the poorest fifth of the population. Absolute values of t-statistics are in parentheses.

Table 5

Monetary Policy and the Income of the Poor with Continent Dummies

	(1)	(2)	(3)	(4)	(5)
Average inflation	-1.47 (2.23)		-5.71 (1.95)		-1.65 (1.03)
Standard deviation of nominal GDP growth		-0.85 (1.96)		-3.80 (1.64)	0.13 (0.13)
Outliers excluded?	No	No	Yes	Yes	No
Sample size	66	66	58	61	66
R^2	0.67	0.66	0.68	0.66	0.67
S.e.e.	0.75	0.76	0.77	0.78	0.76

The dependent variable is the logarithm of the average income of the poorest fifth of the population. All equations include continent dummies. Absolute values of t-statistics are in parentheses.

Table 6

Monetary Policy and the Income of the Poor in Industrialized Countries

	(1)	(2)	(3)	(4)	(5)
Constant	8.87 (64.51)	8.71 (48.90)	9.12 (39.23)	8.49 (22.94)	8.84 (65.24)
Average inflation	-6.74 (5.79)		-9.69 (3.85)		-9.87 (3.90)
Standard deviation of nominal GDP growth		-11.79 (3.46)		-5.98 (0.64)	7.76 (1.38)
Outliers excluded?	No	No	Yes	Yes	No
Sample size	19	19	18	18	19
R^2	0.66	0.41	0.48	0.02	0.70
S.e.e.	0.31	0.41	0.31	0.42	0.30

The dependent variable is the logarithm of the average income of the poorest fifth of the population. Absolute values of t-statistics are in parentheses.

Table 7

Monetary Policy and Inequality

	(1)	(2)	(3)	(4)	(5)
Constant	0.41 (27.07)	0.43 (31.70)	0.37 (10.85)	0.39 (16.64)	0.41 (23.57)
Average inflation	0.19 (2.79)		0.64 (1.94)		0.24 (1.22)
Standard deviation of nominal GDP growth		0.12 (2.49)		0.61 (2.35)	-0.04 (0.27)
Outliers excluded?	No	No	Yes	Yes	No
Sample size	76	76	68	71	76
R^2	0.09	0.08	0.05	0.07	0.10
S.e.e.	0.10	0.10	0.10	0.10	0.10

The dependent variable is the Gini coefficient. Absolute values of t-statistics are in parentheses.

Table 8

Monetary Policy and Inequality with Continent Dummies

	(1)	(2)	(3)	(4)	(5)
Average inflation	0.12 (2.00)		0.24 (0.93)		0.34 (2.29)
Standard deviation of nominal GDP growth		0.05 (1.15)		-0.10 (0.48)	-0.15 (1.59)
Outliers excluded?	No	No	Yes	Yes	No
Sample size	76	76	68	71	76
R^2	0.57	0.55	0.57	0.54	0.59
S.e.e.	0.07	0.07	0.07	0.07	0.07

The dependent variable is the Gini coefficient. All equations include continent dummies. Absolute values of t-statistics are in parentheses.

Table 9

Monetary Policy and Inequality in Industrialized Countries

	(1)	(2)	(3)	(4)	(5)
Constant	0.29 (19.07)	0.30 (16.65)	0.29 (11.11)	0.35 (9.46)	0.30 (18.60)
Average inflation	0.46 (3.41)		0.55 (1.89)		0.72 (2.66)
Standard deviation of nominal GDP growth		0.75 (2.12)		-0.45 (0.48)	-0.69 (1.10)
Outliers excluded?	No	No	Yes	Yes	No
Sample size	21	21	20	20	21
R^2	0.38	0.19	0.17	0.01	0.42
S.e.e.	0.04	0.04	0.04	0.04	0.04

The dependent variable is the Gini coefficient. Absolute values of t-statistics are in parentheses.

Chart 1

Poverty and Unemployment

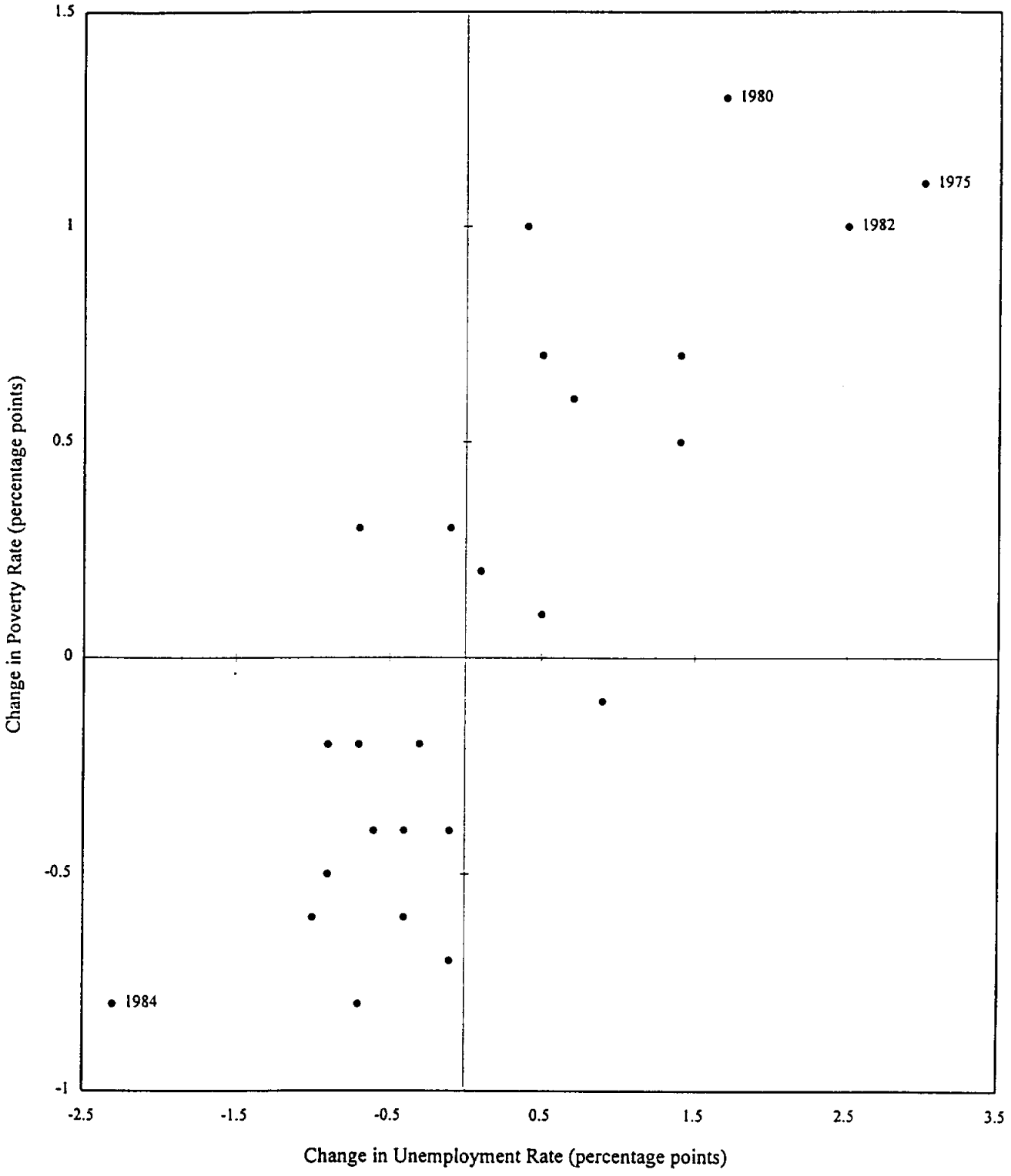

Chart 2

Poverty and Unanticipated Inflation

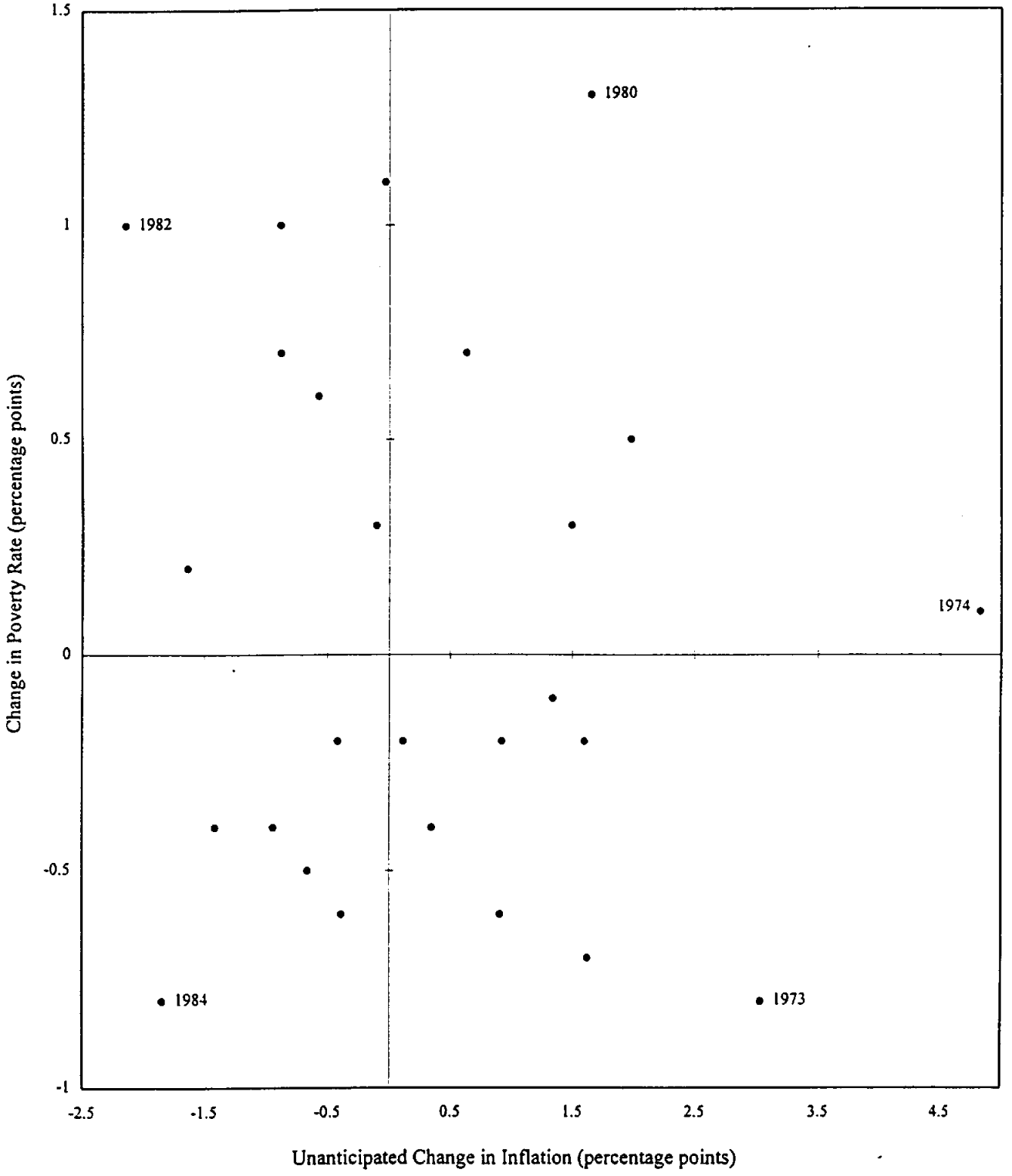

Chart 3

Poverty and Anticipated Inflation

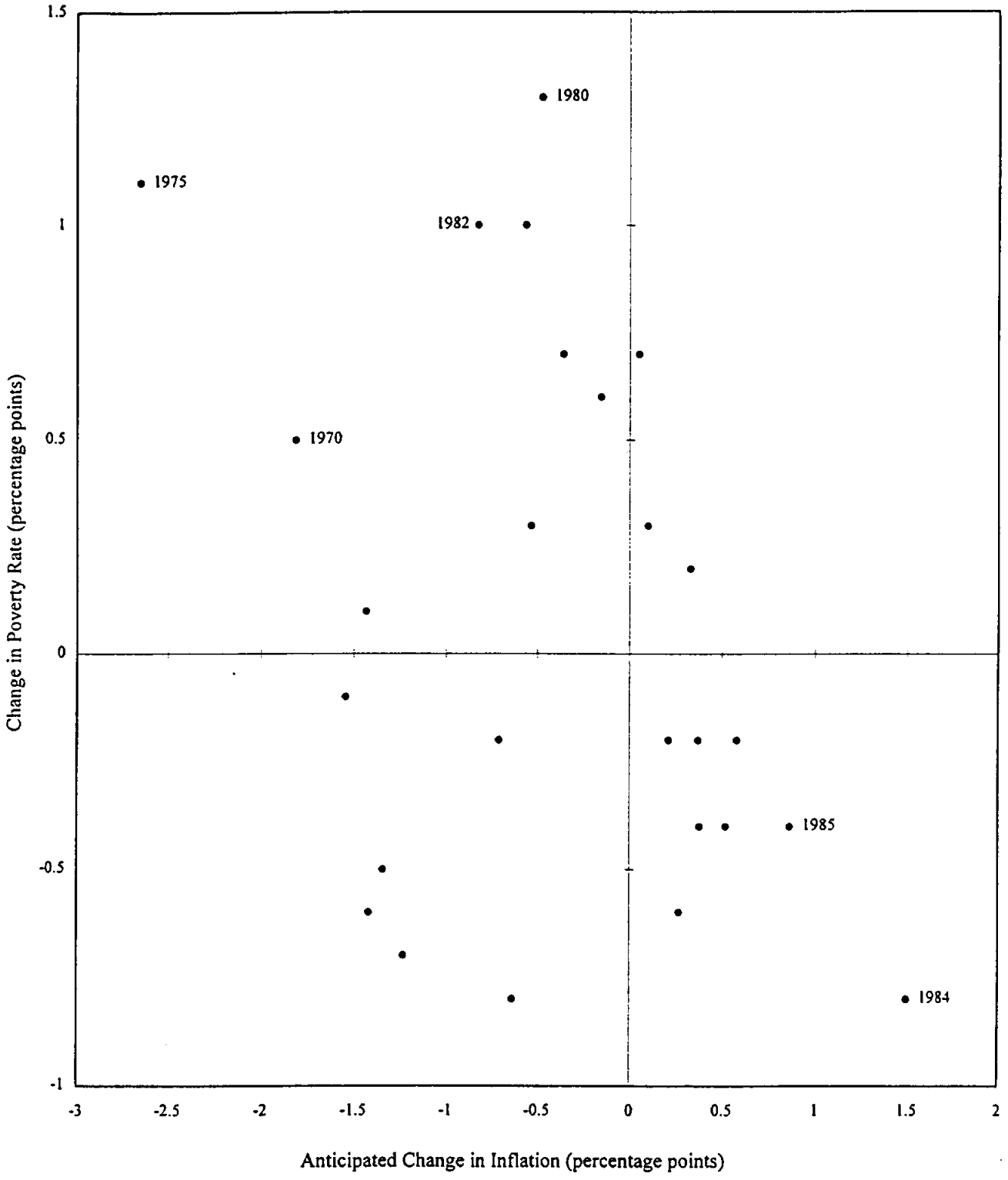

Chart 4

The Income of the Poor and Average Inflation

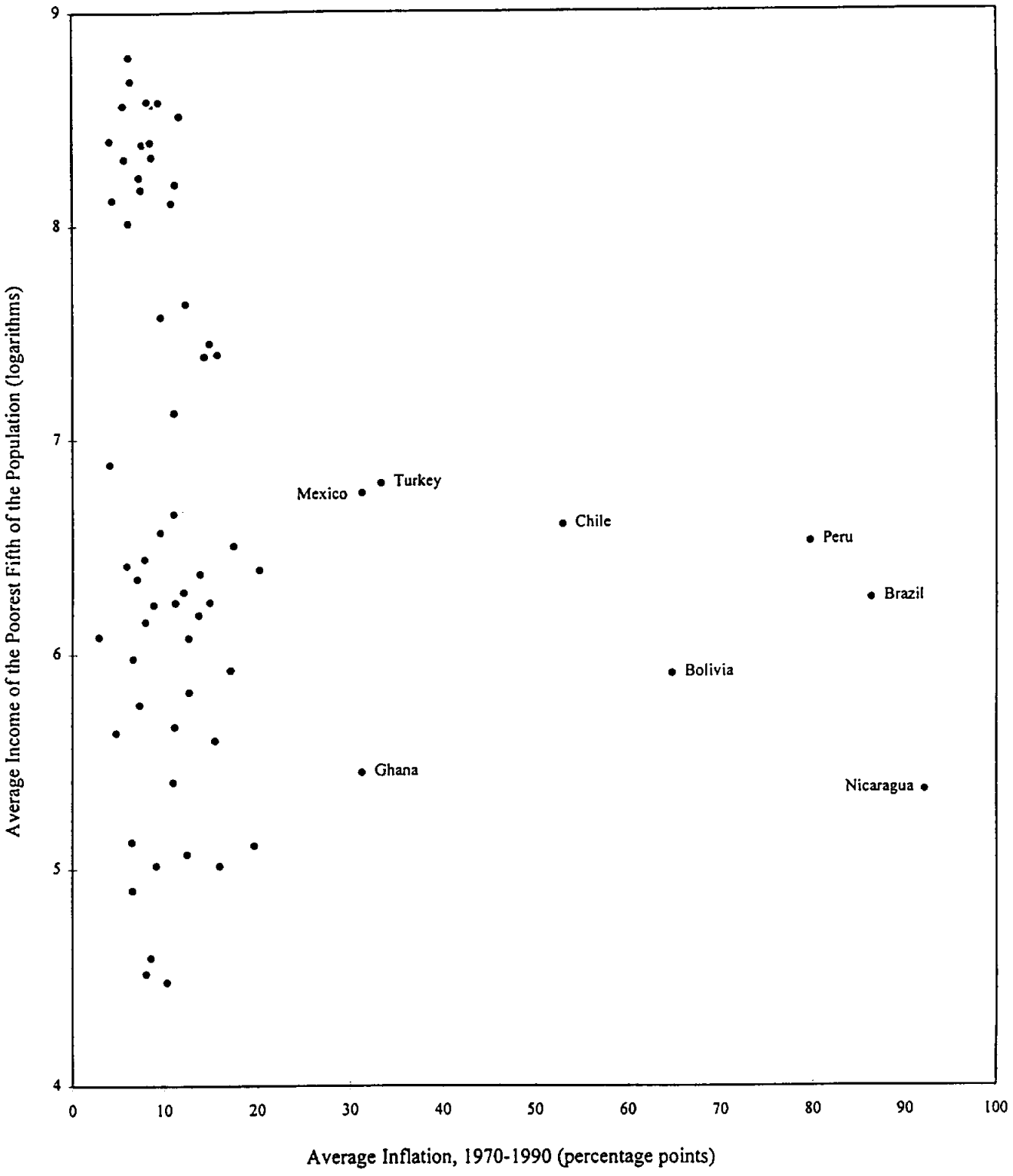

Chart 5

The Income of the Poor and Aggregate Demand Variability

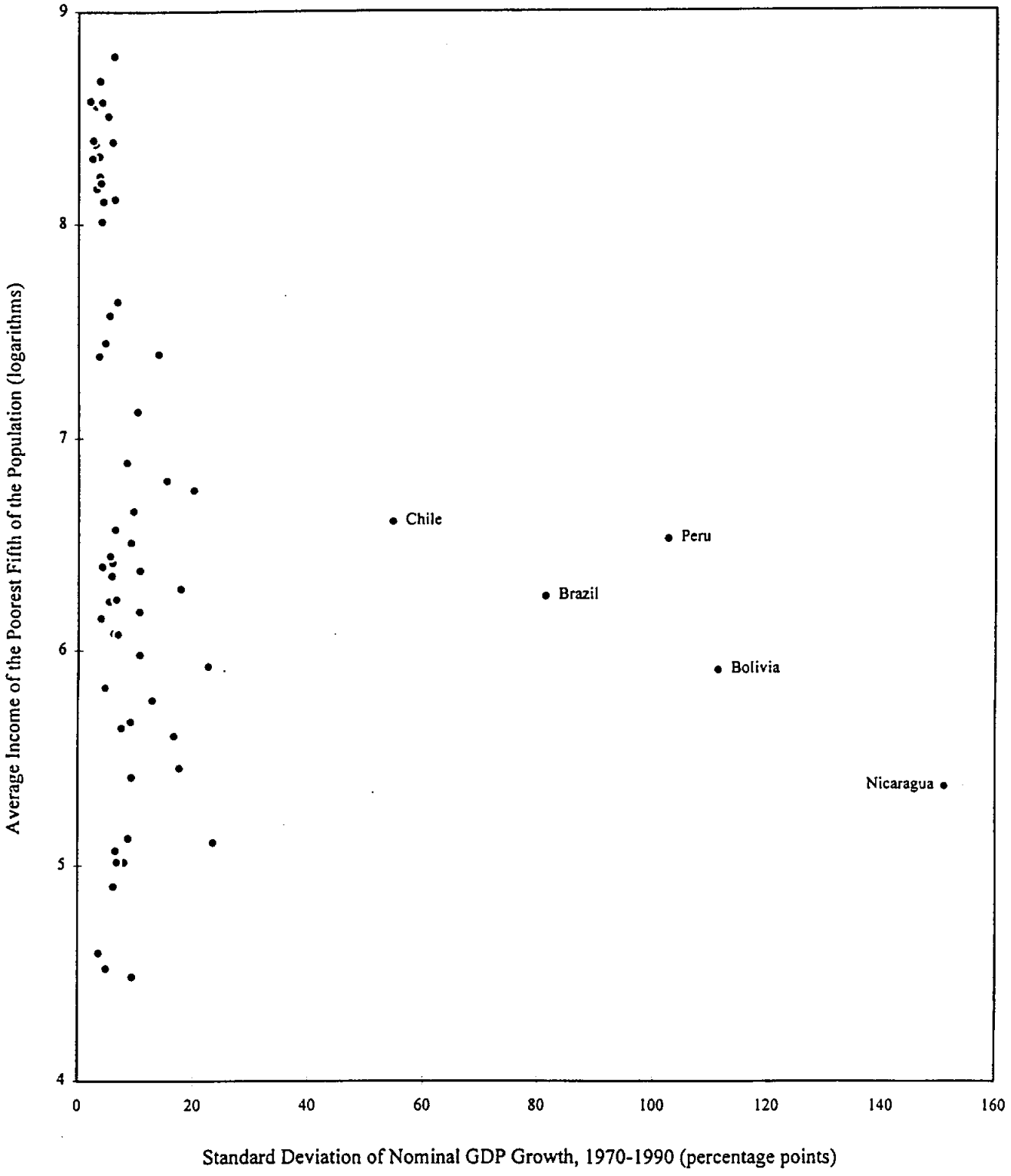

Chart 6

The Income of the Poor and Average Inflation Excluding Outliers

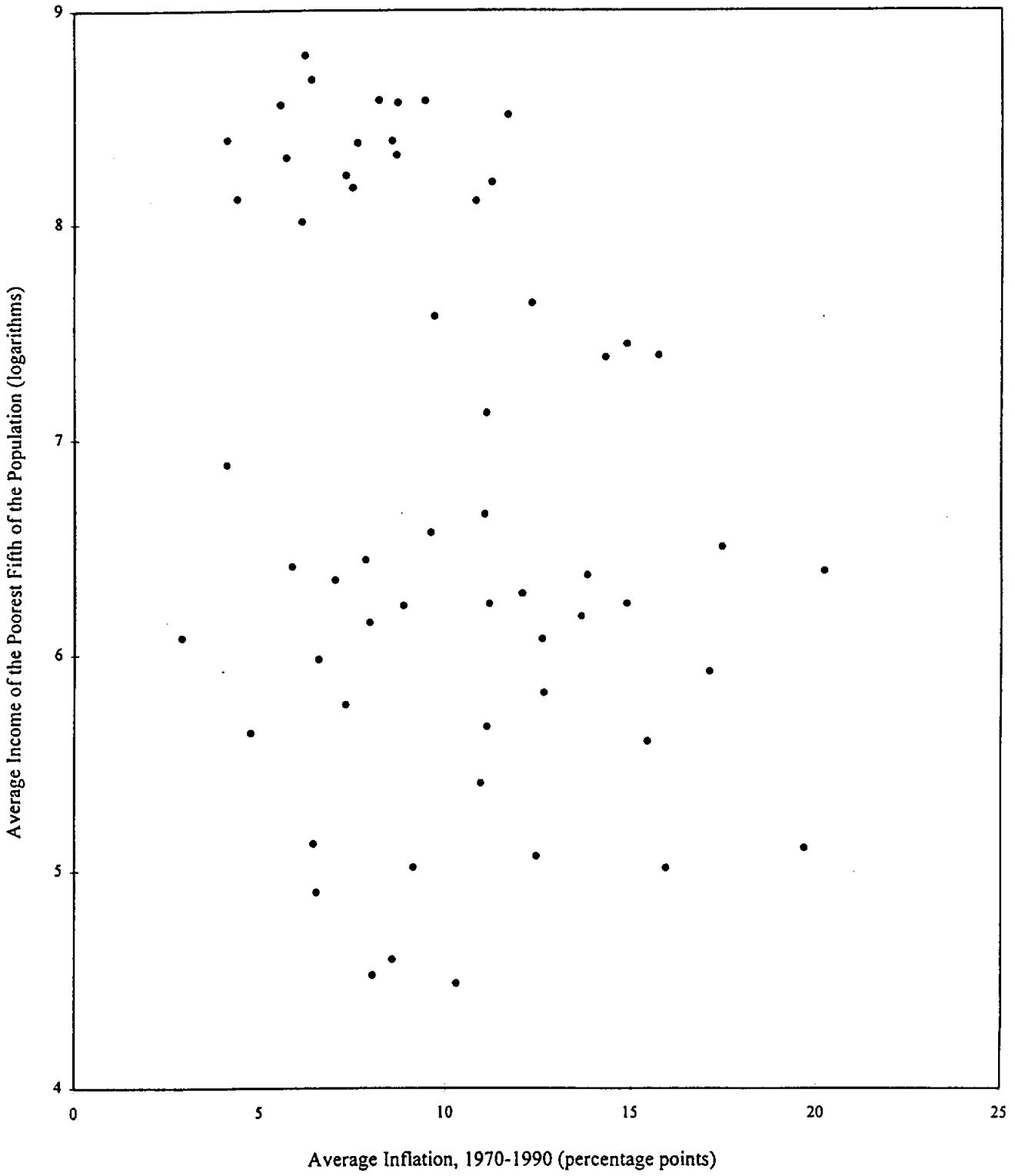

Chart 7

The Income of the Poor and Aggregate Demand Variability Excluding Outliers

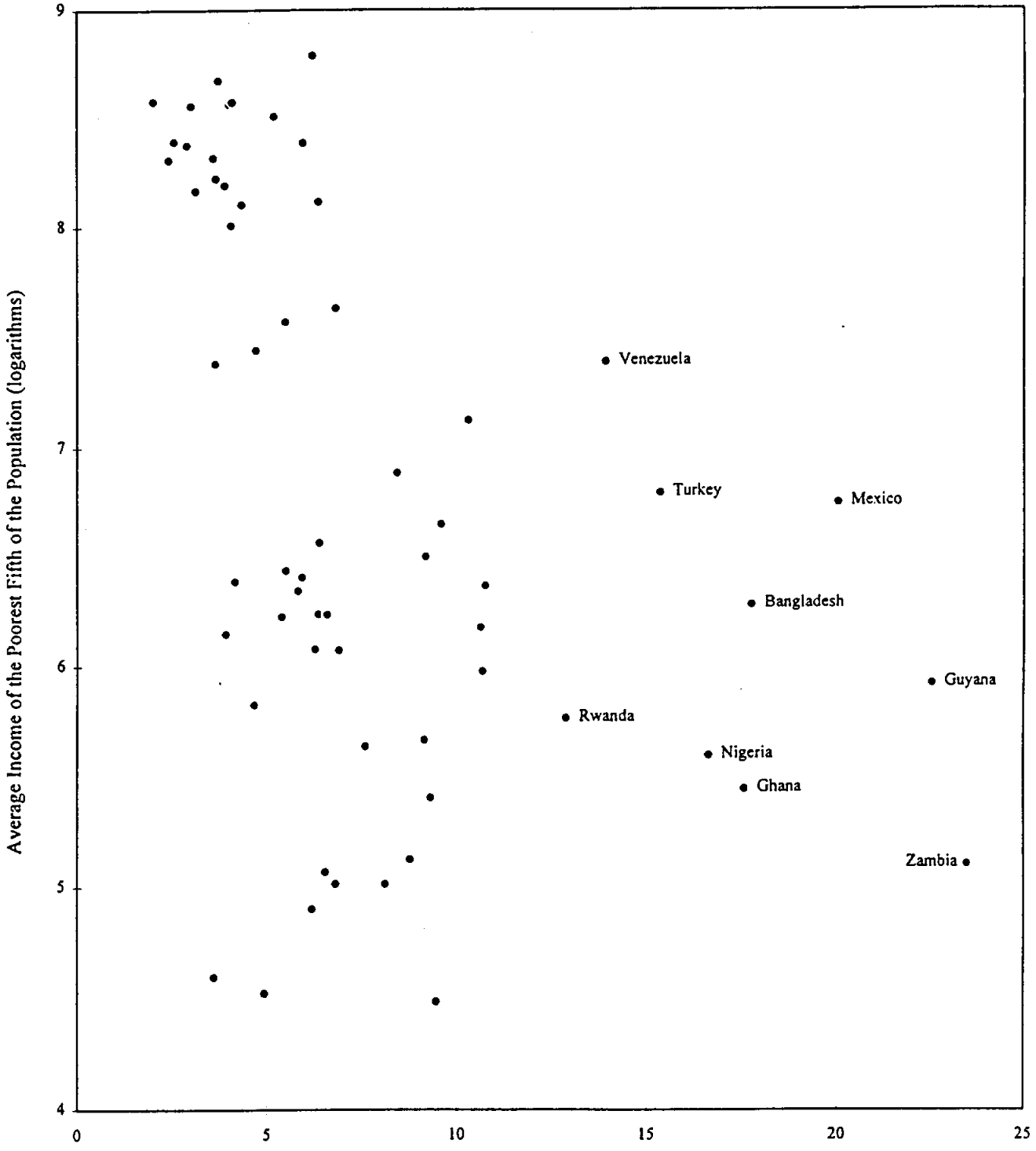

Chart 8

The Income of the Poor and Average Inflation in Industrialized Countries

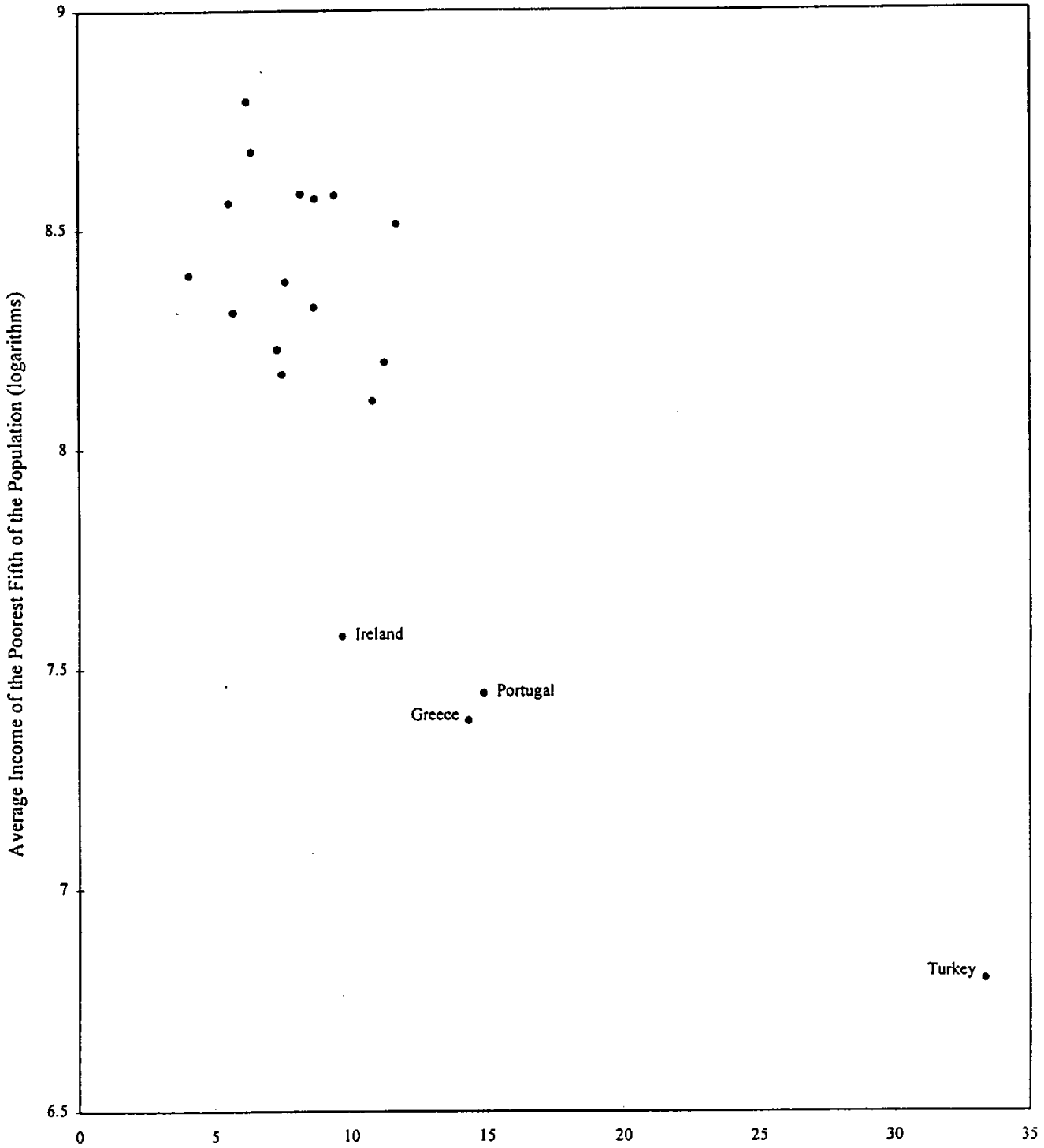

Chart 9

The Income of the Poor and Aggregate Demand Variability in Industrialized Countries

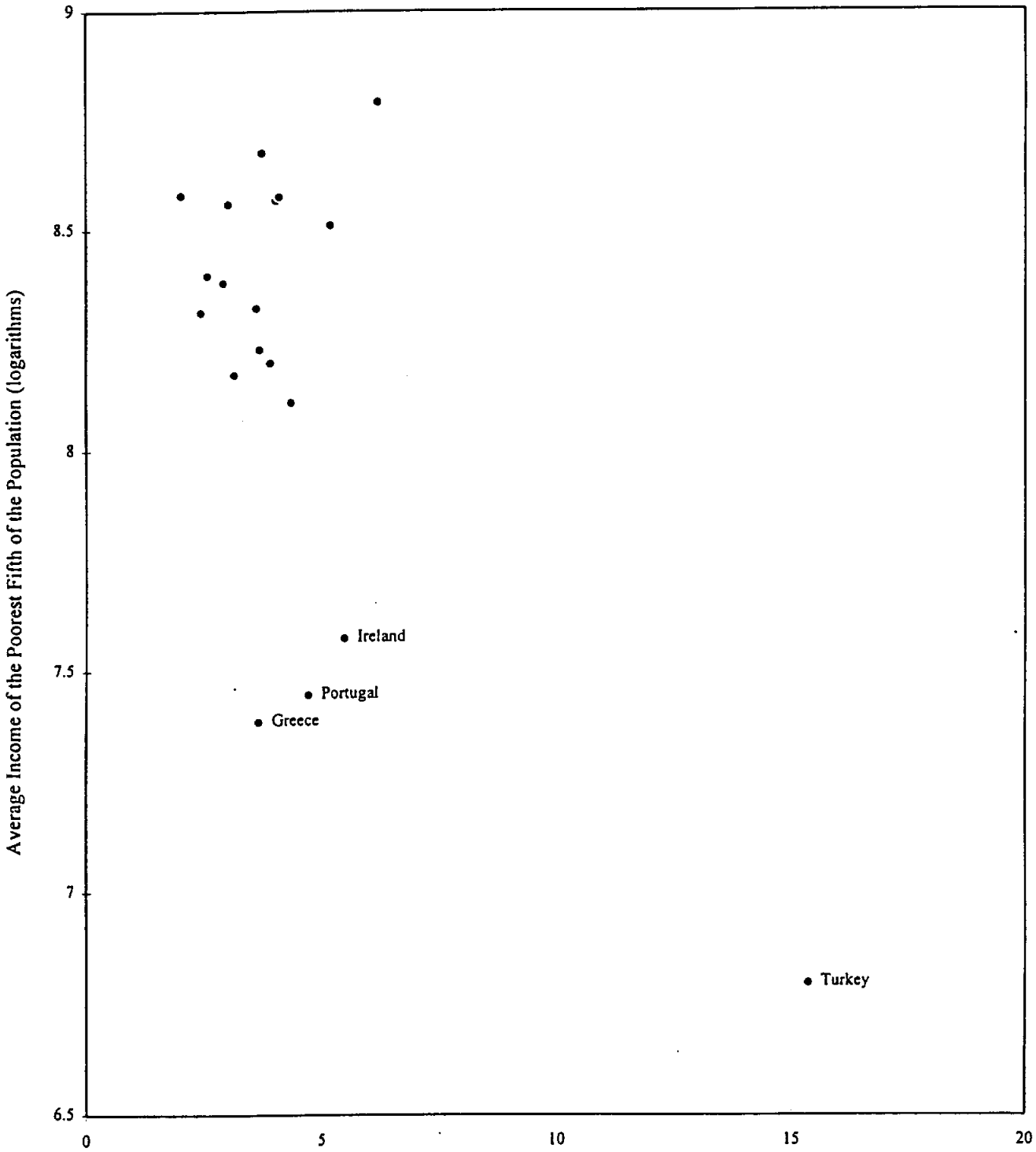

Chart 10

Inequality and Average Inflation

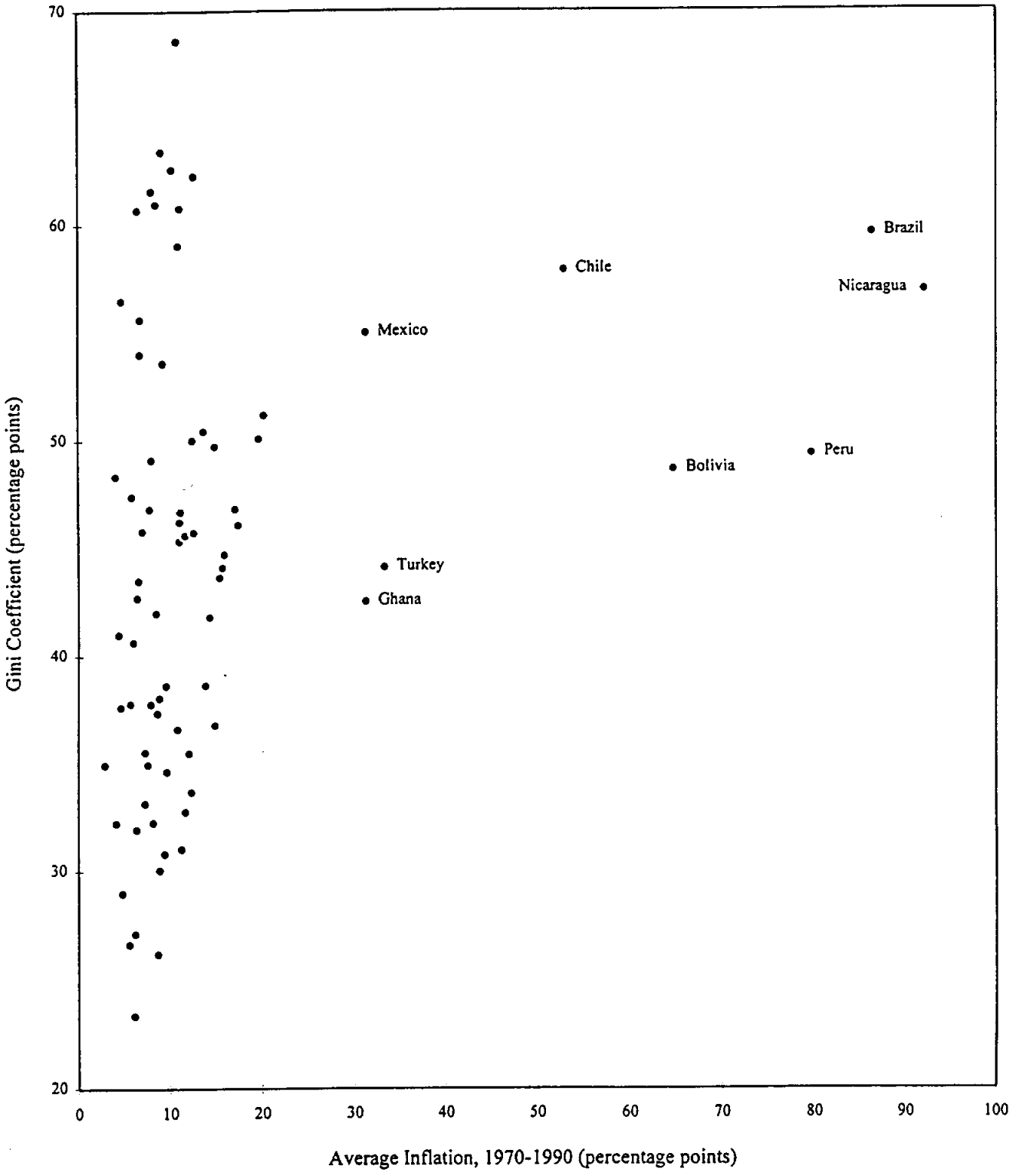

Chart 11

Inequality and Aggregate Demand Variability

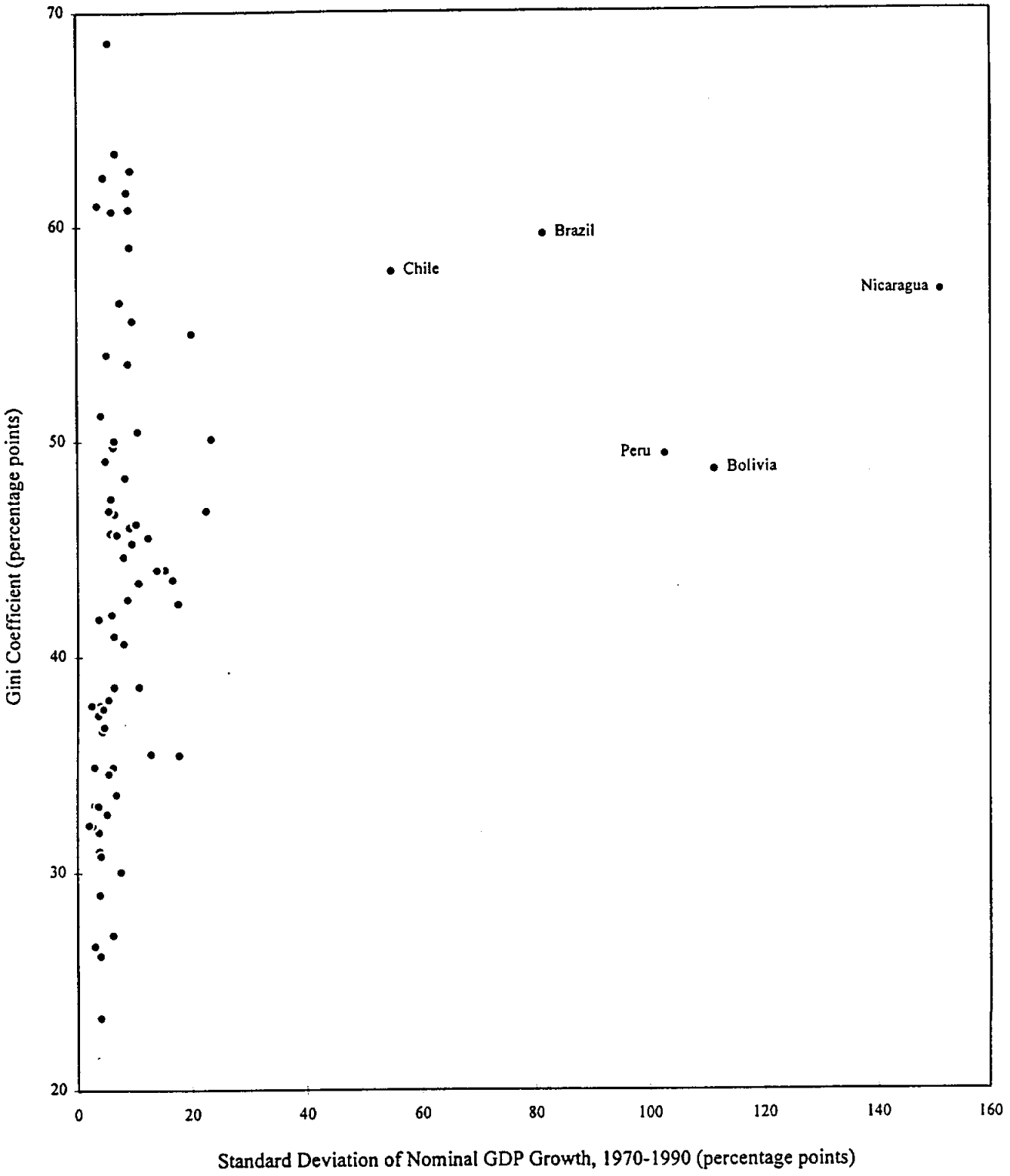

Chart 12

Inequality and Average Inflation Excluding Outliers

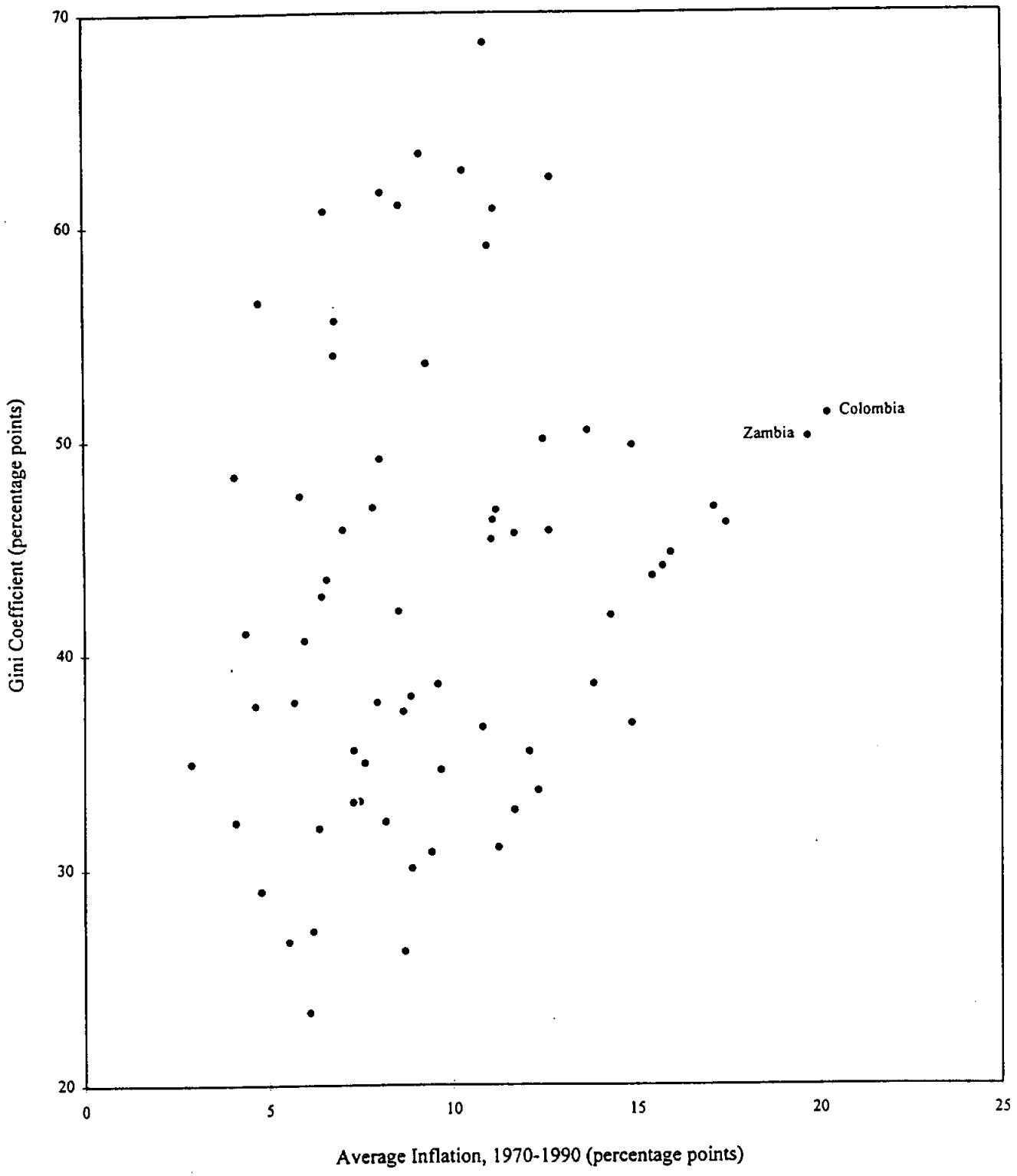

Chart 13

Inequality and Aggregate Demand Variability Excluding Outliers