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CHANGES IN THE DISTRIBUTION OF INCOME AND THE NEW ECONOMIC MODEL IN JAMAICA

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CONTENTS

INTRODUCTION

The last two decades have witnessed the implementation of liberal economic reforms throughout the developing world, but particularly in Latin American and the Caribbean. It is now a stylized fact of reform programs that income distribution worsens in the immediate aftermath of the implementation of such reforms (Cornia, et. al., 1987; Morley, 1995; Beccaria, 1998). In 11 of 14 Latin American countries included in his survey, Morely (1994) found that inequality had worsened in all but four of them during the 1980s when reform programs were implemented.

In that regard, Jamaica has been a paradox. Handa and King (1997) date economic reform as taking place mostly since 1989. Throughout the 1990s, however, the income distribution has consistently narrowed, despite periods of both rising and falling poverty levels during this time.

The decline in inequality in Jamaica is unusual for another reason as well. While economic growth may on occasion be accompanied by declining inequality, witness Brazil in the 1980s, the preponderance of evidence from the Latin American/Caribbean region suggests that inequality is strongly countercyclical (Psacharopolous, et al., 1997; Morley, 1994). During the 1980s, Argentina, Panama, and Venezuela all experienced increases in inequality while their per capita incomes fell, while Columbia and Costa Rica both had positive growth and declines in inequality (Psacharopolous, et. al., 1997).[1] At the same time, there is no prior measured experience in the region of declining inequality in the presence of falling per capita income. The case of Jamaica, with just such an occurance in the period 1992 to 1996, therefore merits close scrutiny.

The Jamaica experience can potentially reveal much about how the process of adjustment can affect income distribution. Are the distributional outcomes in Jamaica an accident of the particular circumstances of the adjustment, or are there lessons in the manner of adjustment that have implications for other reforming economies?

The earliest published attempt to analyze the degree of income inequality in Jamaica (Ahiram, 1964), using data for 1958, concludes that Jamaica suffered a higher degree of income inequality than most developing countries with data available at the time.[2] Ahiram reports a Gini of 53 percent for the distribution of household income and 57 percent for the distribution of individual income. Londoño and Székely (1997) report that, by 1970, Jamaica was characterized by one of the most equal distributions in the Latin American and Caribbean region, though the region tends to be more unequal than the remainder of the developing world. They report a Gini of 45.6 for 1970, which by 1989 had fallen marginally to 43.3. From the data reported below, in 1996 the Gini was down to 36.9. The purpose of this paper is to examine the distributional

changes in Jamaica in order to explain the paradox of such a dramatic decline in inequality during and after a period of economic reform, and, after 1992, in the presence of macroeconomic stagnation.

While the penchant for liberal economic reforms has shifted the focus away from issues of distribution, the concern in the literature and in this paper for inequality derives from two considerations. Ravallian (1997) has demonstrated that the growth elasticity of poverty is inversely correlated with the degree of inequality. Thus, as inequality increases, growth has a smaller impact on poverty reduction. A concern for absolute poverty therefore requires an interest in distribution to the extent that it informs the likelihood of poverty reduction. Moreover, the link between initial inequality and subsequent economic growth has been demonstrated (Deininger and Squire, 1998; Birdsall, et al., 1995).

The remainder of the paper is organized as follows. Section 1 reviews the data on changes in the distribution of income that have occurred during the period. Section 2 summarizes the economic reform program and the macroeconomic context of the period under analysis, examining the extent to which the manner and pace of reform implementation explains the distributional outcomes. Section 3 attempts to explain the distributional outcomes in terms of the broader context of the policy framework and the consequential fluctuations of the macroeconomy.

I. CHANGES IN DISTRIBUTION

Data for the analysis of inequality is taken from the *Jamaican Survey of living Conditions*, a nationally representative household survey administered annually since 1989, and based on the *Living Standards Measurement Surveys* (LSMS) of the World Bank. As in other LSMS type surveys, welfare is measured by total household consumption expenditure (deflated by household size or demographic composition). The relative merit of using consumption instead of income to measure living standard is well known (Ravallion, 1994; Quibria, 1991). Consumption more accurately reflects long run welfare since households attempt to minimize the consumption effects of transitory income shocks by way of saving/dissaving. Consumption is much easier to measure than income in developing countries due to seasonality and the existence of multiple income sources. Finally, income from informal economic activity is difficult to identify much less measure. Deininger and Squire (1996) indicate that using expenditure instead of income reduces the measured Gini by about 6.6 percentage points.

Earned income is reported in the labor force household survey, but the data is notoriously incomplete. In the 1993 survey, for example, nearly 60 percent of the cells for income were missing data. The JSLC survey reports only on unearned income, and in any case is reported at the level of the household, and not assigned to individual members. For all of the above reasons, we use per capita household expenditure to proxy income. The use of per capita household data ought not to bias the estimates of inequality. Londoño and Székely (1997) find that there is no significance difference between Ginis computed on the basis of individual data and those done at the level of the household.

We begin by presenting two popular indices of inequality, the Gini coefficient and the Theil entropy measure, for three years of survey data: 1989, 1993, and 1996. We follow the standard procedure of attributing to each individual in a household the household level per capita expenditure, thus ignoring issues of intra-household resource allocation. We provide estimates of these two indexes for the entire sample. Table 1 presents these estimates for each of the three years, as well as the mean per capita expenditure of the sample, while Table 2 presents the underlying distribution of per capita household expenditure in terms of consumption shares per decile.

Table 1
BROAD INDICES[1]

	1989	1993	1996
Gini	0.436	0.382	0.369
Theil Entropy	0.341	0.260	0.251
Mean p/c Expenditure (1989J$)[2]	6407	6019	4961

Source: The Jamaica Survey of Living Conditions.
Note: Calculated by assigning household per capita consumption expenditure to each individual member
1/ Characteristic of household head. 2/ CPI deflator is 3.85 for 1993 and 8.40 for 1996.

It is often useful to begin with a look at the underlying distribution before considering the indexes based on this distribution. Table 2 and Figure 1 show that inequality improved over this 7-year period. The consumption share of the bottom decile increases from 1.88 to 2.84 percent over the period, and in the bottom quintile, the shares move from 4.95 to 7.06 percent. At the top there is a corresponding decline in consumption shares. Consumption in the top decile moves from 32.28 to 29.17 percent of the total, and for the top quintile, the share declines from 49.12 to 44.45. The distributional shift that has occurred in Jamaica was therefore largely from the upper 20 percent of the population to the lower 60 percent.

Table 2
PER CAPITA EXPENDITURE SHARES (%) BY DECILE

Decile	1989	1993	1996
1	1.88	2.41	2.84
2	3.07	3.87	4.22
3	4.15	5.02	5.15
4	5.26	6.05	6.12
5	6.46	7.14	7.28
6	7.96	8.47	8.47
7	9.77	9.92	9.79
8	12.33	12.19	11.68
9	16.84	15.96	15.28
10	32.28	28.98	29.17

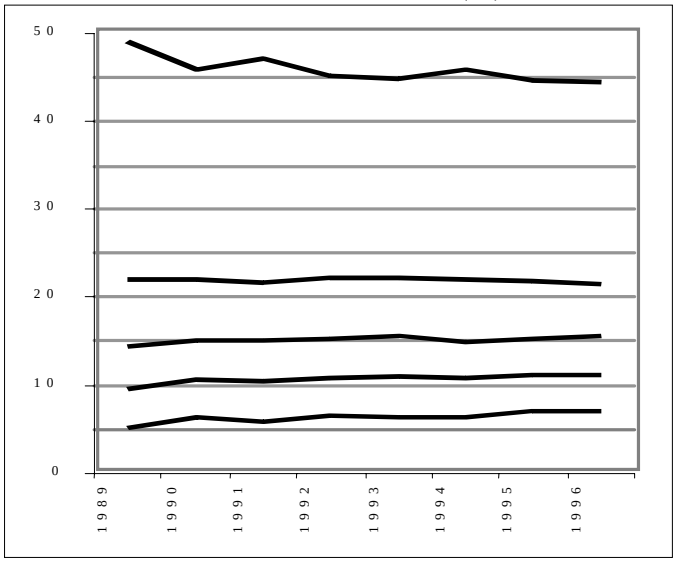
Table 3
COST STRUCTURE OF GDP, PERCENTAGE SHARES

	Comp. of Empl.	Oper. Surplus	Cons. of Fixed Capital	Net Indirect Taxes
1989	44.0	34.2	7.8	14.0
1990	42.8	36.7	7.8	12.7
1991	41.8	39.5	7.3	11.4
1992	39.8	39.9	7.2	13.1
1993	43.6	34.6	7.5	14.3
1994	41.9	37.6	6.9	13.6
1995	42.8	35.3	7.0	14.8
1996	43.6	35.7	6.9	13.8

Source: National Income and Product Accounts, various years, Statistical Institute of Jamaica.
Note: Rows sum to 100.

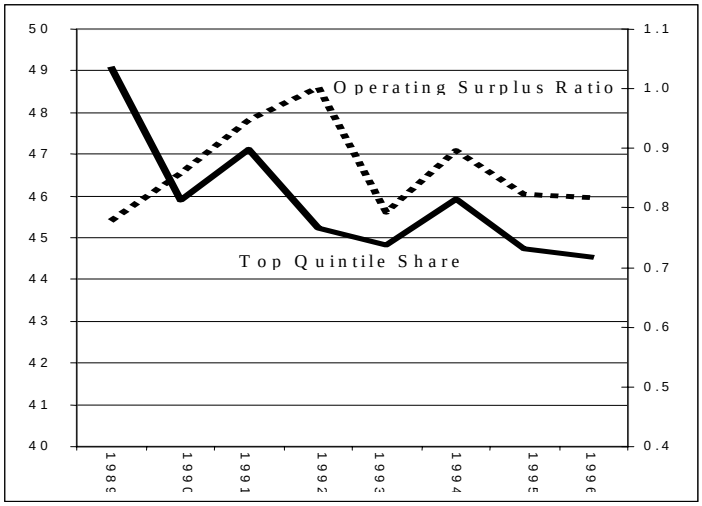
Reflecting the above observation of declining inequality, the value of the inequality indexes for the full sample reported in Table 1 show steady declines over this period. The Gini coefficient declines from 43.6 to 36.9 percent, and the Theil from 34.1 to 25.1 percent. Note however, that while inequality was apparently falling during this period, poverty was rising—mean per capita expenditure in constant Jamaican dollars falls significantly over this time period, from J$6407 to J$4961. Therefore, the decline in inequality took place in an economic context of increased impoverishment. That is, there is a reverse convergence wherein the income of the relatively wealthy is declining faster than that of the poor.

Figure 1
PER CAPITA EXPENDITURE SHARES (%) BY QUINTILE



Romaguerra (1998) argues and evidences that household survey data may sometimes mislead, and therefore requires corroboration. In Figure 2, the ratio of operating surplus to employee compensation from the national accounts is graphed along with the expenditure share of the highest quintile from the household survey. Between 1989 and 1992, there is no correlation between the two measures, either in terms of direction of change or coincidence of turning points. After 1992, however, the two move closely together, corroborating the claim that the top quintile has had a relative fall in share since then.

Figure 2
DISTRIBUTION INDICATORS



Note: Operating Surplus Ratio = Ratio of operating surplus to employee compensation from the national accounts; Top Quintile Share = Share of highest quintile in total expenditure from the household survey.
Source: Authors computation from the National Income and Product Accounts of the Statistical Institute of Jamaica and from the Jamaica Survey of Living Conditions.

1. Theil decompositions

The Theil inequality index can be decomposed in order to assess the contribution of sub-group inequality to total inequality (Bourguinon, 1979). A formula for the decomposition analysis is

$$\text{Theil Index} = \Sigma \{q_i * T_i + q_i * \log(q_i / p_i)\},$$

where the left hand side is the Theil Index for the full sample, q_i is the income share of group i, p_i is the population share of group i, and T_i is the Theil index for sub-group i. The first term on the right hand side of the equation is the 'within' group inequality index; the second term is the 'between' group inequality index; and the ratio of the between to full sample indexes gives the proportion of total inequality attributable to group i.

Table 4 provides decompositions based on 6 different levels of education.[3] The striking result is the huge increase in the proportion of total inequality that is explained by differences between education groups. In 1989 only 4 percent of total inequality was explained by differences between education groups, while in 1993 and 1996 this proportion rose to 16 percent. The detailed decompositions indicate that differences in consumption are largest between those whose household head had attained A-levels and those whose head had not. The within group estimates indicate that inequality is highest among those living in a household headed by a primary school graduate, or a graduate of the first level secondary school.

Table 4
DECOMPOSITION OF THEIL INDEX BY EDUCATIONAL LEVEL

	1989	**1993**	**1996**
Between	0.013	0.043	0.041
None	-0.034	-0.005	-0.011
Some primary	-0.010	-0.024	-0.013
Primary	-0.054	-0.045	-0.033
1st cycle secondary	-0.027	-0.025	-0.032
2nd cycle secondary	0.040	0.037	0.033
A-level or above	0.097	0.105	0.098
Within	0.301	0.215	0.210
None	0.006	0.001	0.010
Some primary	0.043	0.010	0.015
Primary	0.096	0.068	0.050
1st cycle secondary	0.084	0.054	0.063
2nd cycle secondary	0.031	0.040	0.044
A-level or above	0.041	0.042	0.028
THEIL	0.313	0.258	0.252
Between/THEIL	0.040	0.168	0.164

Table 5
DECOMPOSITION OF THEIL INDEX BY ECONOMIC SECTOR

	1989	1993	1996
Between	0.003	0.001	0.009
Agriculture tradable	-0.043	-0.045	-0.007
Agriculture non-tradable	-0.047	-0.060	-0.043
Mining	0.008	0.002	0.000
Manufacturing	0.028	0.017	0.015
Services tradable	0.041	0.027	0.008
Services non-tradable	0.016	0.060	0.036
Within	0.320	0.229	0.237
Agriculture tradable	0.004	0.006	0.005
Agriculture non-tradable	0.073	0.037	0.042
Mining	0.004	0.002	0.000
Manufacturing	0.043	0.024	0.015
Services tradable	0.088	0.022	0.008
Services non-tradable	0.108	0.138	0.167
THEIL	0.323	0.230	0.246
Between/THEIL	0.009	0.004	0.036

The contribution of inequality between age groups to total inequality has remained stable at 5 percent over this period (Table 6). However, the prime age group (25-60) has both the highest within and between Theil indexes, which, when added together, represent 70 percent of the full sample Theil. Hence, not only is this group characterized by high within group inequality, but inequality between this group and other age groups is also an important source of inequality in Jamaica.

Table 6
DECOMPOSITION OF THEIL INDEX BY AGE GROUP

	1989	1993	1996
Between	0.017	0.013	0.015
0-15	-0.065	-0.064	-0.068
16-24	-0.009	-0.004	-0.003
25-60	0.086	0.079	0.072
61+	0.005	0.002	0.014
Within	0.325	0.246	0.236
0-15	0.086	0.067	0.053
16-24	0.055	0.037	0.033
25-60	0.151	0.114	0.109
61+	0.033	0.028	0.040
THEIL	0.342	0.259	0.250
Between/THEIL	0.051	0.051	0.059

Decomposition analysis based on geographic area is presented in Table 7, and show that the percent of total inequality explained by regional inequalities has declined moderately over

this time period, from 8.8 percent in 1989 to 6.2 percent in 1996. The within group indexes show that inequality within rural areas was higher than in urban areas in 1989, but is now actually lower than in urban areas in 1996. Note that the within and between components for urban areas together account for approximately 90 percent of total inequality in Jamaica.

Table 7
DECOMPOSITION OF THEIL INDEX BY GEOGRAPHIC REGION

	1989	**1993**	**1996**
Between	0.030	0.021	0.016
Urban	0.138	0.111	0.095
Rural	-0.108	-0.090	-0.080
Within	0.311	0.240	0.235
Urban	0.152	0.149	0.138
Rural	0.159	0.091	0.097
THEIL	0.341	0.260	0.251
Between/THEIL	0.088	0.079	0.062

Table 8 presents the decomposition analysis by gender, and shows that virtually none of total inequality is explained by differences between males and females, but rather within these two groups. For example, inequality among males alone accounts for over 50 percent of total inequality in Jamaica. This outcome, however, laregly reflects the result of using per capita household expenditure, where households commonly contain both sexes.

Table 8
DECOMPOSITION OF THEIL INDEX BY GENDER OF PERSON

	1989	**1993**	**1996**
Between	0.001	0.000	0.001
Male	0.018	0.004	0.026
Female	-0.018	-0.004	-0.024
Within	0.340	0.260	0.249
Male	0.183	0.123	0.142
Female	0.157	0.137	0.107
THEIL	0.341	0.260	0.251
Between/THEIL	0.002	0.000	0.005

In Jamaica, 42 percent of households are headed by females, hence it is particularly important to understand differences in well being between male and female households. Table 9 provides decomposition analysis of inequality based on gender of the household head, and reveals that only 1-2 percent of total inequality is explained by inequality between these two groups. On the other hand, inequality is very high within each group, especially among the group of male-headed households. Inequality among individuals living in male-headed households alone accounts for 65 percent of total inequality in Jamaica, and this ratio has remained constant over this time period.

Table 9
DECOMPOSITION OF THEIL INDEX BY GENDER OF HOUSEHOLD HEAD

	1989	1993	1996
Between	0.006	0.003	0.004
Female	-0.050	-0.039	-0.044
Male	0.055	0.043	0.048
Within	0.335	0.257	0.246
Female	0.109	0.111	0.084
Male	0.226	0.146	0.162
THEIL	0.341	0.260	0.251
Between/THEIL	0.017	0.013	0.017

2. Analysis of variance

The contribution of sub-group inequality to total inequality in Jamaica can also be assessed by the standard analysis of variance to decompose the variance in the log of per capita expenditure into principal or 'main' factors, based on the sub-groups discussed above. We have five groups or categories of variables: gender of the individual, region of residence[4], industry of main earner, education and age of head. Full results of the ANOVA are given in the appendix, while Table 10 summarizes the main contribution of each factor in terms of its contribution to the total variance of log per capita expenditure.

Table 10
CONTRIBUTIONS TO OVERALL INEQUALITY FROM ANOVA

Group[1]	1989	1993	1996
Sex (2)	0.19	0.25	0.25
Region (3)	5.61	1.63	4.76
Industry (6)	1.20	3.26	0.60
Education (6)	5.71	5.95	8.44
Age (4)	2.93	3.42	3.75

Source: ANOVA results in Appendix Table A1.
Notes: Decomposition of variance of log per capita expenditure.
1/ Numbers in parenthesis in this column are number of categories in each group.

The analysis of variance corroborates the conclusions of the Theil decompositions. The R squared (or percentage of the variance of the dependent variable explained by the main factors) is around 23 percent in each year, and while the contribution of each specific factor is significant, the quantitative contribution of each varies significantly. Table 10 indicates that in 1989, both region of residence and education of head each explained about 5.6 percent of the variance of log per capita consumption, while the contribution of gender of the individual, though statistically significant, was virtually zero. Between 1989 and 1993, the contribution of industry almost triples, from 1.20 to 3.26 percent, and the contribution of region of residence declines. Finally, in 1996 the relative contribution of education increases steeply to 8.4 percent of the total variance of log per capita expenditure.

The full ANOVA reported in the appendix allows for two way or interaction effects among the main variables. Inclusion of these interactions only succeeded in raising total R squared by 2-4 percent depending on the year. In these estimates, the main effect of gender becomes statistically insignificant, and the interaction between area and industry and industry and education are significant, but not quantitatively so (percent of contribution to total variance always less than 2 percent).

The striking change that has occurred between 1989 and 1996 in terms of the decomposition of inequality appears to have been the rise in significance of education, evidenced in both the Theil decomposition and the ANOVA. At the same time, it is noteworthy that the structure of inequality in 1996 is not far different from that of 1989 for the other categories, namely, region and industry.

Hence during this period, education has become an increasingly important determinant of inequality in Jamaican society. That is to say, the education premium has risen. There are two possible factors thay may underlie such change. First, the level of education of the relatively more educated may have increased, and along with it, their productive capacity and thus also their factor earnings. There is, however, no evidence from the public education budget nor private education expenditure to suggest that such an increase in educational output has occurred. The second possibility is that the scarcity rents earned by each group has shifted in response to changes in labor demand.

II. ECONOMIC AND POLICY CONTEXT

In light of the observation that the implementation of liberal economic reform is often accompanied by increasing ineqaulity during the process of economic adjustment, the first place to look for an explanation of declining inequality in Jamaica is the policy history. We seek to find out the extent to which structural adjustment reforms have actually been implemented, if these reforms can explain the decline in inequality, and the role of other policy changes and economic shocks in the distributional outcome.

1. Economic reform program

In 1980, the new administration inherited an economy with restrictions on domestic product, labor, and capital markets, impediments to international trade and capital flows, an overbearing public sector, and an unstable currency. Jamaica's economic reform program is assessed in terms of market liberalization, external openness, the burden of government, and stabilization.

1.1. External openness

Trade liberalization started in the early part of the 1980s, with the removal of most quantitative restrictions and their replacement by (in most cases, high) tariffs. Later in the decade, most remaining quantitative restrictions were removed, while tariffs continued to accord domestic production protection from international competition. Tariff Reductions have taken place almost entirely in the 1990s, as part of Jamaica's participation in the Common External Tariff agreement of the Caribbean Community (CARICOM). A measure of the severity of the import tariff regime is the highest tariff that obtains within each 2-digit aggregation of the harmonized system commodity code, averaged over all 2-digit categories. Using this index, the average maximum tariff was 43 percent throughout the 1980s, but fell to 37 percent in the tariff reductions of 1991. However, the most significant tariff reductions occurred in 1995, when the average maximum fell to 24 percent. This index reflects a dichotomy since in most cases the maximum tariff in a category applies to consumer goods, while tariffs on most raw materials and capital goods have been removed entirely.

Throughout the 1970s and 1980s, the most effective obstacle to free trade was foreign exchange control regulations. In the 1980s, the black market premium fluctuated in a range from 10 percent to 65 percent, with the highest premia occuring early in the decade. Exchange control regulations were removed in 1991, but the central bank issued indicative exchange rates to commercial banks for another two years, during which time the black market premium fell to under 10 percent. The foreign exchange market was completely liberalized in 1993, at which point the black market exchange rate converged to the rate obtained through authorized dealers.

In consideration of the tariff reductions and exchange control removal of the period 1991 to 1995, we may conclude that, while there may have been only limited economic reform during the 1980s, there was positive and significant reform during the period 1991 to 1995. And most of that occurred at the end of that period.

1.2. Market liberalization

Market liberalization has been partial and inconsistent, with no clear patter emerging that could be characterized as economic reform. Financial markets were deregulated, to the extent that deposit rate limits were removed and the use of quantitative credit controls discontinued in 1991. However, mandatory cash reserve and liquid assets ratios (25 and 47 percent respectively) for commercial banks remain at high levels by international standards, constraining the capacity of the banking sector to intermediate savings.

Because of the high reserve requirements, and as evidence of inefficiency in the sector, the spread between average lending and borrowing rates offered by commercial banks increased sharply in the nineties. That spread remained at single-digit levels throughout most of the 1980s, but by 1996 had reached 21.4 percent. Further, the ratio of domestic credit to GDP did not expand to evidence the deepening of the financial sector which should have followed liberalization in this sector. Indeed, the domestic credit/GDP ratio was lower after 1991 than it was before. Between 1980 and 1990, the ratio was between 39 and 86 percent. Between 1991 and 1996, the range was 17 to 33 percent.

Labour market reform has taken the form of reduction in income tax rates and simplification of the tax structure. At the beginning of the eighties, the structure of taxes on personal income included six tax brackets with a top marginal rate of 80 percent. In 1981, the highest marginal rate was reduced to 57.5 percent. Major tax reform occurred in 1986, wherein the tax structure was greatly simplified to a zero-tax threshold and a single tax rate of 33.3 percent above the threshold. In 1991, that tax rate was lowered to 25 percent. Labor market reform is incomplete, however. The accommodative legislative framework that governs collective labor agreements remains unchanged, and the obligatory dismissal cost was actually increased in 1991 for some categories of workers.

Liberalization in product markets consisted of the removal of price controls. This occurred throughout the 1980s, and was largely complete by 1990. The only regulated prices that remained in the 1990s were on public utilities and public transportation.

The accumulation of the above evidence is that domestic market liberalization was largely not realized. Restrictions in capital market and labor markets remain, and suggest that economic reform in this area remains to be done. Distributionally, this means that gains in allocative efficiency that could have been realized to produce GDP growth did not occur.

1.3. The burden of government

In terms of the burden of government on the economy, policy has again been inconsistent, both across areas of policy and over time, but a pattern does emerge. The share of public employment

in the total employed labor force fell from 20 percent in 1980 to 11 percent in 1987, and has remained nearly constant since then. The privatization program officially began in 1980, but with no enthusiasm and little execution. Indeed, there was a major acquisition in 1982. Only 13 (net) privatizations took place between 1980 and 1988, for an annual average of less than 1.5. Beginning in 1989, however, the pace of privatizations increased considerably. Twelve occurred in 1989 alone, and between 1990 and 1996 the government averaged more than five privatizations per year.

Other aspects of the governmental burden have seen reversals, however. The relative size of government expenditure in the economy, measured by expenditure net of amortization over the GDP, declined from 50 percent in 1980 to a low of 24 percent in 1989, but since then has risen, and stood at 35 percent in 1996. And the government share of domestic credit, constant until 1991, rose sharply after 1993.

The above implies the size of the governmental burden in the economy declined smoothly up to 1990, after which it reversed itself. This reversal suggests that efficiency gains that were to be derived from a shrinking governmental burden may have already been exhausted from the 1980s, while the reversal of the 1980s would be working against the reforms in balance-of-payments liberalizations for the purpose of the promotion of economic growth.

1.4. Macroeconomic stability

Jamaica has suffered from volatile, double-digit inflation rates as well as a secularly depreciating exchange rate since the early 1970s. Relative stability was achieved in the late 1980s, only to be reversed in the early 1990s when the inflation rate peaked at 80.2 percent in 1991. After that, an orthodox, disinflation program based on reductions in the growth rate of the monetary base gradually pushed down the inflation rate until it reached 15.8 percent in 1996.

While the decline in the growth rate of the monetary base and in inflation may suggest a stable economic environment towards the middle of the decade. Inflationary expectations were much more intransigent, as evidenced by the domestic/international interest differential as an indicator of the market's expectation of the rate of depreciation of the currency (Dornbusch, 1976). The differential between the domestic treasury bill rate and LIBOR (on equal 3-month instruments) was negative in the early 1980s, and became mildly positive in 1983 and 1984. From 1985 to 1991, it ranged between 10 and 20 percent, and from 1992 to 1996, fluctuated between 20 and 40 percent. This evidences a rise in the public's assessment of the instability of the currency that belies the consistent fall in inflation rates that has occurred in the 1990s.

The record on the pursuit of macroeconomic stability is therefore mixed. While inflation fell consistently after 1992, it had not reached single digit levels up to the end of our period analysis, 1996. Further, inflationary expectations remain high. The macroeconomy, on balance, was more unstable during the period 1991 to 1996 than it had been in the 1980s.

1.5. Assessing the timing and consistency of reform

The evidence presented above suggests that economic reform has been sporadic, uneven, and inconsistent, with some policy reversals. The failure of inequality to worsen in Jamaica during a "period of economic reform" after 1989 may therefore be because a part of the economic reform had already taken place between 1980 and 1989. Specifically, government expenditure as a share of GDP and public sector employment as a share of total employment both declined consistently and dramatically between 1980 and 1989. During that period, the expenditure/GDP share fell from 50 to 24 percent while public sector employment was reduced from 20 percent of the labor force to 11 percent. Furthermore, the income tax reform program was implemented almost entirely prior to 1989. One effect of the income tax reform was to replace a progressive tax structure with a more regressive one. Finally, while foreign exchange controls were not relaxed until 1991, modifications to the exchange control regime between 1981 and 1983 reduced the cost of trading in foreign exchange, which effect was manifest in a fall in the black market premium after 1982. With reduced public expenditure and lower employment, along with regressive income tax reform, it is likely that some of the negative distributional consequences of economic reform may already have been manifest prior to 1989.[5]

While some aspects of the economic reform program were implemented after 1989, the general program of reform was compromized by policy reversals in other areas. After 1989, the principle areas of policy reform were privatization and balance-of-payments liberalization. At the same time, however, the public sector reversed the trend from the previous decade and increased its share of the economy, both in terms of expenditure and in terms of its use of domestic credit. The effective income tax rate on average income increased from a low of 20 percent in 1986 to 36 percent in 1992, a change which would disproportionately affect lower income brackets. In addition, the cost of laying off labor was *increased* in 1991.

Finally, several parts of the policy environment remained unreformed throughout the period of analysis. The domestic capital market was subject to high reserve ratios, the labor market saw no reform of the legislative framework that governs industrial relations, and while inflation declined, expected depreciation remained high. In aggregate, economic reform, of some kind, occurred throughout the period from 1980 to 1995. But different aspect of reform occurred at different times, and reversals tended to send confusing signals to the markets. 1989 to 1996 therefore does not constitute an appropriate period in which to isolate the potential negative distributional impact of economic reform.

2. Macroeconomic consequences

The Jamaican economy experienced very little growth over this period (as indeed, over the last two and a half decades). GDP expanded by a mere 9 percent in total from 1989 to 1993, after which the economy stagnated and then contracted in 1995 and 1996. This outcome may be attributed in some part to both the liberalization of trade and capital flows and to the disinflation policy.

From the policy program outlined above, the confluence of macroeconomic policy initiatives that came together during the period 1992 to 1996 consisted of an orthodox disinflation program based on real monetary contraction combined with fiscal expansion. High real interest rates were the consequence of the combination. Real interest rates (weighted average commercial bank prime lending deflated by the Consumer Price Index) averaged negative 4.1 percent in the period from 1989 to 1992. By contrast, from 1993 to 1996 the average was positive 16.8 percent. With capital flows newly liberalized, the attractive returns on capital sustained a capital inflow that generated a revaluation of the local currency. In real terms, the currency appreciated by 45 percent between its historic trough in 1991 and its value in 1996.

High real interest rates, an increasingly overvalued currency, and the removal of protection from some domestic industries in the tariff reductions of 1991 and 1995, all combined to reduce economic growth and ultimately, to contract the economy. By 1996, the GDP fell by 1.7 percent, its second consecutive year of decline.

This combination of policies and outcomes can have deep and widespread distributional implications. Economic contraction reduces the demand for all factors, and the returns to some, depending on the flexibility of the markets in which they operate. Falling inflation is usually progressive as wage earners, bound by long-term contracts with embedded wage escalation, benefit from inflation outturns that are lower than expected. But falling inflation may have perverse consequences at the low end of the income structure, since informal sector workers tend not to be bound by formal contracts at all and may not derive this “benefit” that accrues to workers in the formal sector.

The direct distributional effect of interest rates will depend on which income strata are net creditors/debtors. The indirect effect of interest rates, through disinvestment and recession, will depend on the whether firms tend to layoff quickly or hoard labor. Finally, the restructuring of the economy necessitated by the more open trade regime may shift the demand for various factors of production.

III. EXPLAINING THE DISTRIBUTIONAL CHANGES

The argument thus far suggests only that the sequence of reform implementation explains why the income distribution did not worsen between 1989 and 1996. An explanation of why it improved is still required. The salient aspects of the distributional evolution emerging from above that require explanation are as follows. Over the entire period, narrowing inequality is accompanied by rising poverty – the distribution is shifting down.

To understand the changes in distribution, we divide the total period of our analysis at 1993. Before this, dramatically falling inequality is accompanied marginally falling poverty – the poor are improving both absolutely and relatively. Subsequently, moderately falling inequality occurs with rising poverty – the poor are worse absolutely, but better off relatively. Further, the decline in inequality seems to be motivated by a redistribution from the wealthiest quintile to everyone else.

In order to trace the distributional consequences of economic reform in Jamaica, one needs to focus on the interaction between and amongst distribution and aspects of economic reform that were present in the period from 1990 to 1996. As indicated above, the relevant aspects of economic reform were trade liberalization, capital flow liberalization, fiscal expansion, along with orthodox stabilization. Below, we argue that liberalization of international capital flows and its consequences, along with fiscal expansion, swamped whatever potential distributional benefit would have come of trade liberalization.

1. Sectoral adjustment

The immediate distributional implications of balance-of-payments liberalization ought to have been a contraction in newly exposed industries. If trade restrictions had been applied uniformly, the sectors that would have derived the most protection would have been those with the least comparative advantage. In a small economy, those sectors are more often than not industrial, which make intensive use of physical and human capital. Under such circumstances, the external liberalization would be progressive, shifting the functional distribution towards labor and lowering the skill premium.

In Jamaica, however, with its hilly terrain and small domestic market, it is arguable that Jamaica lacks a comparative advantage in agriculture. In any case, the agricultural sector was highly uncompetitive, in sugar, bananas, and vegetables – the main crops, and were thus the beneficiaries high levels of protection under the old tariff regime. Put another way, both manufacturing and agriculture produced vulnerable importables. In the immediate aftermath of

trade liberalization, these sectors ought to contract in favor of non-tradables, which tend to be both labor and non-skill intensive. Again, given labor market regidities, such a contraction would affect the functional distribution by first having an impact on operating surpluses. For both of these reasons, the impact effect of external opening should be progressive, though not necessarily through the usual shift from manufacturing towards agriculture. Ultimately, of course, the expansion of exportables, from wherever they may come, will complicate the distributional outcomes.

Further, the sectoral shifts expected from trade liberalization would have been enhanced by the effect of the currency appreciation. Tradable sectors on both sides of the trade balance would have become less competitive with respect to world production and should have contracted relative to non-tradables, further promoting a progressive distributional outcome.

There is at least superficial consistency between the theoretically expected distributional shifts and the empirical outcome of less inequality evidenced by the data presented above. But this is not what has happened in Jamaica. Neither the relative price changes nor the sectoral shifts in the structure of trade support such a Stolper-Samuelson type explanation. Table 12 showing sectoral economic performance indicates no broad tendency for tradables to grow at the expense of non-tradables. Tradable manufactures declined while tradable agriculture stagnated and tradable services grew spectacularly. The failure of the structure of trade to respond in the expected direction is not surprising in the presence of relative price shifts that did not reflect an increased premium on tradable activity (Table 11).

Table 11
REAL SECTORAL PRICES

	Agric., Tradable	Agric., Non-tradable	Mining	Manu-facturing	Services, Tradable	Services, Non-tradable
1988	1.03	0.85	1.20	1.01	1.06	0.99
1989	1.00	1.00	1.00	1.00	1.00	1.00
1990	0.99	0.86	0.85	1.01	0.96	1.03
1991	0.94	0.94	0.94	1.08	0.83	0.98
1992	1.22	0.93	0.85	1.10	0.75	1.00
1993	1.14	0.89	0.60	1.09	0.53	1.05
1994	1.09	0.95	0.63	1.11	0.61	1.03
1995	1.09	0.95	0.66	1.05	0.57	1.02
1996	1.06	0.80	0.50	1.02	0.63	1.01

Source: Author's computations from the National Income and Product Accounts, Statistical Institute of Jamaica.

Notwithstanding our failure to identify a relative price motivation, a significant feature of the entire period is the impressive growth in domestic agricultural production. Between 1989 and 1993, non-tradable agriculture, mainly root crops and spices, grew by an accumulated 47 percent, and up to 1996 by an accumulated 69 percent (Table 12). Some of this represented recovery from a temporarily low base. The 1989 survey data was gathered less than one year after a hurricane destroyed much agricultural capacity, but this does not explain the entire increase, which continued through to 1996. Export agriculture, mainly sugar and bananas grown on large estates by commensurately large enterprises, did not fare near as well, rising only six percent over the same

four year period. Domestic agriculture in Jamaica, as elsewhere, occupies the poorest of the population, so improvement in the sector will improve the income distribution. In order to understand the remainder of the distributional shift, we must look to factor price changes.

Table 12
CHANGES IN THE SECTORAL STRUCTURE OF PRODUCTION

	1989	1990	1991	1992	1993	1994	1995	1996
SHARES								
Agriculture tradable	1.1	1.1	1.1	1.1	1.0	1.0	0.9	1.0
Agriculture non-tradable	4.4	4.6	4.6	5.1	5.3	5.8	5.8	5.9
Mining	7.0	8.1	8.4	7.9	7.4	7.9	7.2	7.7
Manufacture	20.0	19.6	17.9	17.5	16.0	15.8	15.5	14.9
Services tradable	11.2	11.5	13.2	14.0	18.1	17.7	18.0	17.7
Services non-tradable	56.3	55.0	54.8	54.4	52.0	51.8	52.6	52.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
INDEX OF LEVEL								
Agriculture tradable	100	107	105	106	108	106	101	109
Agriculture non-tradable	100	113	113	131	147	160	165	169
Mining	100	123	130	126	127	136	126	136
Manufacture	100	104	96	97	95	95	95	92
Services tradable	100	109	127	140	194	190	198	197
Services non-tradable	100	104	105	108	110	110	115	116
Total	100	105	106	108	109	110	111	109
CONSTANT DOLLARS								
Agriculture tradable	200	213	210	211	215	212	202	218
Agriculture non-tradable	769	867	868	1,009	1,127	1,231	1,269	1,301
Mining	1,238	1,521	1,607	1,566	1,571	1,680	1,565	1,683
Manufacture	3,541	3,678	3,401	3,445	3,378	3,360	3,361	3,258
Services tradable	1,971	2,147	2,512	2,758	3,829	3,748	3,906	3,884
Services non-tradable	9,942	10,299	10,429	10,726	10,975	10,985	11,448	11,544
Total	17,660	18,726	19,027	19,714	21,096	21,216	21,751	21,887

Source: National Income and Product Account, Various Years, Statistical Institute of Jamaica.

2. Factor price changes

2.1. Changes in factor prices

Because the period of analysis, 1989-96, is relatively short, factor supplies did not change in an economically significant way during that time. For that period, the average growth rate of the labor force was 1.1 percent, with the growth rate having a standard deviation of only 1.98. At the same time, however, the average of the annual absolute changes in the real wage was 11.4 percent, with a standard deviation of the change in the wage of 14.8. Changes in labor supply cannot therefore account for the observed wage fluctuations. The skill structure of the labor force also remained virtually unchanged over the period. While 82.7 percent of the labor force had neither professional nor vocational training in 1989, by 1996 that percentage had fallen only marginally to 80.5. Similarly, the effect of net capital formation on the total capital stock from year to year is negligable, compared to the observed fluctuations in the return to capital. We therefore look to factor price changes induced by changes in factor demand or in the structure of the labor market.

Rather, the evolution of the distribution of income in Jamaica reflects factor price changes induced by macroeconomic fluctuations. Of particular significance are: positive economic growth to 1993 and stagnation thereafter; and dramatically rising inflation to 1991, followed by the successful disinflation. Those events, along with an appropriate specification of a segmented labor market, produces the factor price changes that provide an explanation of the distributional outcomes that have occurred.

Theoretically, recessions have clear distributional consequences. In so far as operating surplus is the residual after labor and other costs are met, revenue contraction is first manifest in a relative shift in the functional distribution of income away from operating surplus towards labor. Further, since the fixed cost of hiring and training tend to be higher for employees with more human capital, layoffs occur first at the bottom of the skill distribution. These considerations set up contradictionary but clear distributional expectations. The functional shift is progressive, but affects earners of operating surplus – the top of the income distribution. The layoffs directly affect the distribution of labor income and should be manifest as a rise in the skill premium.

In order to understand how these recession induced changes in the demand for labor and disinflation affect the structure of wages, we characterize the labor market in Jamaica. Formal, negotiated labor contracts with terms of up to three years are pervasive, with predetermined wage escalation not indexed to changes in the CPI, and so wage adjustment to changing inflationary expectations is slow. In other words, backward-looking contracts are the norm. Because of this, the wage adjustment lag may be as long as three years, and perhaps longer. We therefore assume historically determined (and thus contemporarily exogenous) wages in the formal labor market.

The slow response of nominal wages and the consequent volatility of real wages following the rise and fall in the inflation rate in the early 1990s evidence the validity of this assumption. Note from Table 13 that when inflation soared in 1981 to 80 percent, the nominal wages of neither skilled or unskilled increased commensurately. Wage inflation for each group in that year was closer to the price inflation rate of the year before, around 30 percent. In addition, though the rate of consumer price inflation fell in the two subsequent years, wage inflation rose in both years. That is, in 1993, wage inflation of 59 percent (compared to price inflation of 30 percent) represented the lagged effect of the 80 percent price inflation two years earlier.

We therefore stylize the labor market with a dichotomy into formal and informal segments. In the formal labor market, following the above observations, nominal wages are rigid. (All the wage data in would apply to the formal segment). Employment in the formal sector is therefore determined by the demand side of the labor market. Residual labor is employed in the informal sector where wages are flexible and there is no effective unemployment, though some types of economic activities may be so classified by the employment survey and some who are unemployable and therefore effectively out of the labor force may be also classified as unemploymed.

Table 13
RETURNS TO FACTORS

			Real wage indices			Wage inflation			
	Rent	Rate of interest	Skilled	Unskilled	Nominal wage index: All	All	Skilled	Unskilled	Skill Premium
1989	100	6.8	100	100	100	12.5	20.6	14.2	2.15
1990	89	0.6	100	97	119	19.6	22.2	18.5	2.22
1991	65	-27.0	87	83	157	31.7	31.6	28.7	2.27
1992	46	3.3	75	69	237	51.0	52.4	47.9	2.34
1993	40	10.4	95	89	378	59.0	54.8	58.1	2.29
1994	36	17.8	96	100	538	42.4	35.9	50.3	2.07
1995	41	14.4	115	101	723	34.3	43.8	21.5	2.45
1996	43	24.3	112	92	904	25.0	31.0	17.7	2.73

Source: Author's computations from data provided by theStatistical Institute of Jamaica.

The factor prices that are important to the distributional story are the rate of interest and wages in both labor market segments. Regarding interest rates, the increase described above had consequences for property values and their associated rental income. As an indicator, the rental price of housing declined in real terms by 57 percent between 1989 and 1996. For wages, in the context of an inefficient labor market with lagged wage adjustment, the unanticipated inflation changes resulted in falling real wages in the formal labor market up until 1992, rising thereafter up to 1995. The effect of these formal market developments on the informal labor market, and therefore on the fortunes of the poor, derive from the assumption that has been made about the movement of labor between the two markets. Specifically, the outcome derives from the assumption of free mobility between the two markets and full employment in the informal market.

Table 14
UNEMPLOYMENT RATES

		Gender		Age				Geography		Skill			Sector		
Year	Total	Male	Female	14-19	20-34	35-64	65+	Greater Kingston	Rural	Skilled	Semi-skilled	Un-skilled	Agri-culture	Manu-facturing	Services
1988	18.9	12.0	26.8	44.7	23.7	8.6	3.2	18.2	19.4	15.5	12.0	19.8	3.5	13.4	26.7
1989	18.0	10.9	26.1	48.7	22.5	8.1	2.7	17.7	18.2	16.6	13.2	18.5	3.0	14.2	25.0
1990	15.3	9.1	22.4	37.9	20.4	6.4	2.2	14.5	16.0	13.4	10.0	16.0	2.1	12.6	20.7
1991	15.4	9.4	22.2	39.2	19.0	7.2	2.9	14.0	16.4	11.7	11.8	16.1	3.0	13.7	20.1
1992	15.8	9.5	22.8	35.8	19.1	9.2	5.6	15.5	15.9	15.0	12.4	16.2	5.7	13.6	20.1
1993	16.3	10.9	22.4	38.0	19.3	9.4	4.9	13.2	18.7	15.3	11.0	17.0	4.7	13.6	20.6
1994	15.3	9.6	21.8	35.5	17.6	10.0	5.9	13.9	16.5	13.2	11.4	13.3	5.8	13.1	18.5
1995	16.2	10.8	22.5	45.6	19.7	7.3	2.2	14.5	17.6	14.1	10.4	17.0	3.4	16.9	20.0
1996	16.0	10.0	23.0	47.7	19.4	6.9	2.7	13.5	18.0	14.6	9.8	16.7	3.4	17.0	19.5

Source: Author's computations from data provided by the Statistical Institute of Jamaica.

Table 14 presents data on unemployment rates by various labor market decompositions. Almost as a matter of definition, we do not have data on employment in the informal sector. However, evidence for full employment in informal activities may be drawn from two sources. First, note that though unemployment rates in manufacturing and services is high, unemployment rates in agriculture are negligable and much informal activity resides in agriculture. More significantly, the household survey for 1993 (which had an expanded employment module)

revealed that households that contained an unemployed head of household had expenditure levels that were comparable to and in the case of some sectors higher than that of employed households. This expenditure level of unemployed households is likely based on informal economic activity.

In the presence of declining inflation and backward-looking labor contracts, formal sector wages rose in the mid 1990s. Rising wages and falling aggregate demand encouraged large establishments to shed labor to the informal sector. Employment in large establishments fell by 3.2 percent between 1992 and 1995. With full employment in the informal sector, earnings in the informal sector must have declined. Unfortunately, there is no direct observation of the wage level in the informal sector. However, the significance of education as a explanatory variable for inequality rises over the period. Since the skill demands of informal sector employment are lower than that in the formal labor market, the fall in the informal sector earnings relative to formal sector employment is at least consistent with a rise in the explanatory power of education. In addition, the wage data show a corroborating rise in the skill premium (Table 13). The skill premium increased by 16.7 percent between 1992 and 1996, despite 1992 being previously a peak value for the skill premium.

In summary, the relevant factor prices therefore moved in the following way after 1992. Property rents, having declined to 1992, remained low; interest rates rose dramatically; wages for all classes of formal sector workers increased steadily while employment declined; and informal sector wages probably fell.

2.2. The distributional consequences

The salient feature of the change in the income distribution is the redistribution from the highest quintile towards every other quintile. It is, therefore, the relative loss of income of the highest quintile that requires explanation.

Jamaica has poor data on actual income. In the quarterly *Labor Force Survey*, in which income data is collected, the income cells are as often as not blank. Due to the possibility of selection bias, the remaining cells do not yield reliable information. Therefore, there is no way to directly connect the quintiles to particular income sources. Under these circumstances, we are forced to speculate as to the factor prices that are most likely relevant to each quintile.

Analytically, we treat three income groups. The highest income group, which corresponds to the first quintile, is hypythesized to receive its income from formal sector wages and property ownership. It is likely that the highest quintile is a net debtor, taking into account the corporate debt of enterprise holdings.[6] This is especially likely to evolve in an economic environment that was characterized by negative, real interests rates, with its associated tendency for over-indebtedness.

The middle quintiles would be the corresponding net creditors through ordinary savings instruments, mutual funds, and pension funds. This income group would also likely derive the majority of its income from formal sector employment. The lowest income group, corresponding

to the fifth quintile and perhaps some of the fourth, derives most of its income from informal sector employment, some from the formal labor market, and none from interest income. This latter extreme assumption regarding interest income derives from the observation that, to the extent that the lowest quintile holds savings instruments, it is more likely to be in ordinary savings accounts which pay a low and less volatile interest rate or in revolving credit arrangements which pay none at all.

From all the foregoing, the following hypothesis emerges. The redistribution from the highest quintile to the remainder of the population would be accounted for by the fact that that income group would have negatively affected by declining property values and rents and high interest rates. Property income represents a larger share of the income of the upper quintiles. The decline in property rents would affect those quintiles more than it would the poorer quintiles in the distribution. The move from negative to positive interest rates would also have adversely affected the earnings of the highest quintile given their net debtor status, at least to a greater extent than other income groups.

At the same time, the middle quintiles would have benefitted from the evolution of wage levels. The data differentiate two types of workers in the formal sector: salaried workers are those who occupy executive, clerical, or supervisory positions in the enterprise, while wage earners are directly engaged in the production of output. Salaried workers therefore tend to have higher levels of human capital. Wage earners, while including some highly skilled line workers, would include greater numbers of unskilled workers. In the aggregate, therefore, the earnings of salaried workers would include a higher skill premium.

Wages of both salaried employees and wage earners, after declining dramatically in 1991 and 1992, rose steadily after that up to 1995 (Table 13). During that period, the real wages of salaried workers rose by 53 percent in real terms. That of wage earners went up by 46 percent. For the most part, those dramatic real wage gains represent a recovery from the inflation induced trough of 1992. But while the wage levels of wage earners merely regained their real 1989 values by 1995, that of salaried workers was 15 percent above their 1989 levels, in an economy that had not grown by 15 percent in real terms.

This increase in real wages would help to explain the observed redistribution, at least with respect to the middle to low quintiles. Finally, with the general economy stagnating and formal sector wages rising, the increasing numbers of persons competing for a share of product in the informal sector would explain the observation of rising poverty levels at the bottom of the distribution.

IV. CONCLUSION

In the wake of economic reform, inequality declined while poverty rose - the distribution shifted down. The paradox of declining inequality in Jamaica in the context of liberal economic reforms is reduced to the dominance of stabilization over incomplete adjustment. While the liberalization of domestic financial markets and international finance and trade was taking place, economic reforms in other aspects of the economy, in the market for labor and in the size of government, did not occur. The structural adjustment of the economy was pursued inconsistently and incompletely. Stabilization policy and its macroeconomic consequences overwhelmed the other economic stimuli and dominated the distributional changes.

In particular, the fall in the value of physical capital and the rise in the cost of financial capital adversely affected the fortunes of the wealthiest quintile, which underlie the substantial distributional shift from that group to everyone else below. At the same, the middle strata was somewhat protected by the inflexibility of the formal labor market, as they were able to pass on some of the cost of adjustment to lowest quintile.

The decline in inequality in Jamaica in the 1990s was due mainly to the negative macroeconomic consequences of the stabilization aspect of the reform program, and partly to the lackluster implementation of the adjustment aspects. This hardly provides a lesson for other reforming economies to emulate.

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APPENDIX A

The appendix presents the full results of the analysis of variance exercise

Table 1
RESULTS OF ANOVA
Using log per capita consumption expenditure as dependent variable: Jamaica (1989, 1993, 1996)

1989

Number of obs = 11465 R-squared = 0.2335
Root MSE = .702777 Adj R-squared = 0.2324

Source	Partial SS	df	MS	F	Prob > F
Model	1722.12789	16	107.632993	217.93	0.0000
Sex	14.2656112	1	14.2656112	28.88	0.0000
Region	413.706831	2	206.853416	418.82	0.0000
Industry	88.7145659	5	17.7429132	35.92	0.0000
Education	420.977419	5	84.1954838	170.47	0.0000
Age	216.131753	3	72.0439178	145.87	0.0000
Residual	5654.1202	11448	.493895895		
Total	7376.24809	11464	.643427084		

1993

Number of obs = 6837 R-squared = 0.2477
Root MSE = .596232 Adj R-squared = 0.2459

Source	Partial SS	df	MS	F	Prob > F
Model	798.1635	16	49.8852188	140.33	0.0000
Sex	8.05154009	1	8.05154009	22.65	0.0000
Area	54.2148658	2	27.1074329	76.25	0.0000
Indcat	105.117325	5	21.0234651	59.14	0.0000
Edlevel	191.848909	5	38.3697818	107.93	0.0000
Agecat	114.112275	3	38.0374252	107.00	0.0000
Residual	2424.46215	6820	.355492984		
Total	3222.62565	6836	.471419785		

1996

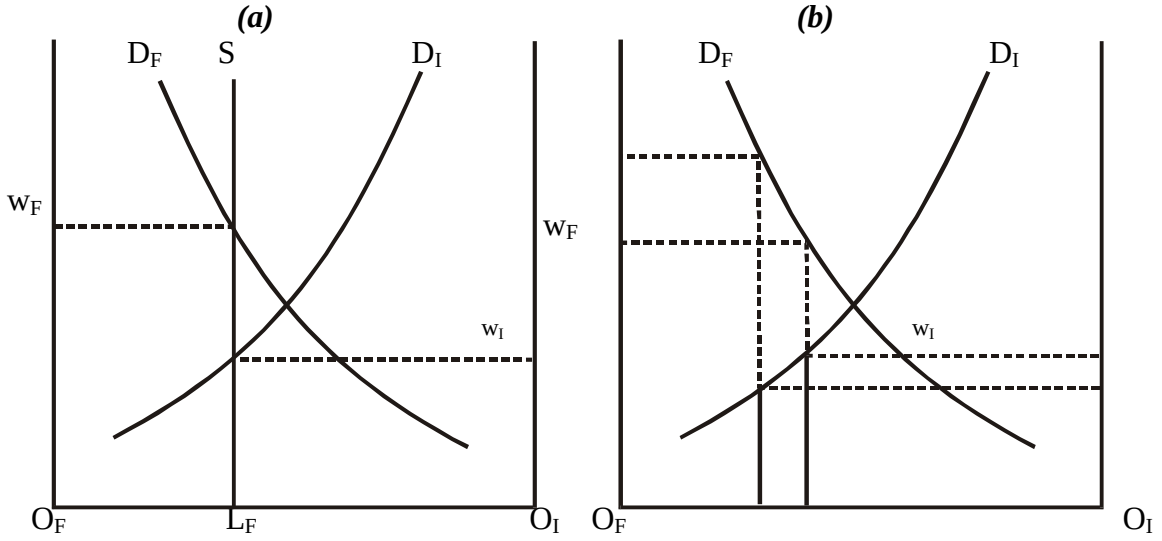
Number of obs = 6359 R-squared = 0.2369
Root MSE = .564226 Adj R-squared = 0.2350

Source	Partial SS	df	MS	F	Prob > F
Model	626.784292	16	39.1740183	123.05	0.0000
Sex	6.69689486	1	6.69689486	21.04	0.0000
Area	125.860396	2	62.930198	197.68	0.0000
Indcat	15.7405767	5	3.14811534	9.89	0.0000
Edlevel	223.302908	5	44.6605816	140.29	0.0000
Agecat	99.176387	3	33.0587957	103.84	0.0000
Residual	2018.98192	6342	.318350981		
Total	2645.76621	6358	.416131836		

APPENDIX B

The assumptions being made in this paper about labor market segmentation and the consequence for wage formation are illustrated in this appendix.

Figure 1
A MODEL OF SEGMENTED LABOR MARKETS



Following Agenor (1996), the relationship between the two can be represented as in Figure 1. In panel "a", the formal labor market is represented by the left vertical axis, measuring the wage, and the horizontal axis reading from left to right. The demand for labor is represented by the downward-sloping curve, D_F. In a corresponding manner, the informal labor market is portrayed by the vertical axis on the right, measuring informal sector wages, and the horizontal axis with its origin to the right. The downward-sloping (right to left) curve, D_I, represents the demand for labor in the informal sector. The length of the horizontal axis is determined by the total amount of labor available in the economy, while the vertical line, S, is positioned to indicate the allocation of labor between the two markets.

The consequences for the informal sector of developments in the formal labor market depend on the assumptions made about endogeniety. If there is no movement of labor between the two markets, that is, S is exogenous, the two wage levels are endogenously determined. This case is shown in panel "a". If there is perfect labor mobility, both the allocation of labor and the uniform wage rate are determined by the intersection of the two demand curves (not shown). Finally, if formal sector wages are determined exogenously, either by a legislated minimum wage or by a historically determined wage, then both the allocation of labor and the informal sector wage are endogenous. This possibility is illustrated in panel "b".

APPENDIX C

In light of the significant distributional changes that have occurred in Jamaica over a short period, it becomes legitimate to ask whether similar redistribution should be engineered as a poverty alleviation mechanism which is alternative to faster growth. In this section, we measure the response of poverty to economic growth alone, holding distribution constant, as well as the impact on poverty alleviation of policies that only reduce inequality without increasing economic growth. This provides evidence to help determine which type of strategy will have a greater impact on poverty reduction.

Table 15 presents estimates of the elasticity of three Foster-Greer-Thorbecke poverty measures (headcount, poverty gap and squared poverty gap) with respect to a small change in mean per capita expenditure (holding distribution constant), and with respect to a small change in inequality (holding growth constant).[7] For each year, we start by presenting the actual value of each of the poverty measures, and as noted above, poverty increased quite dramatically during this period, despite the decline in inequality. In these calculations, the poverty line is set at approximately US$60 per year (measured in J$) in 1989, and then inflated by the CPI to get the poverty line for 1993 and 1996. Hence, the poverty line is held constant in real terms over this period to facilitate analyses over time. The headcount index registers 45.1 percent of the sample poor in 1989, compared to 54.9 in 1996. The poverty gap increases slightly over this period, but the squared poverty gap (which reflects inequality among those below the poverty line) stays about the same. Note that all indices show a decline in 1993.

Table 15
IMPACT OF GROWTH AND DISTRIBUTION ON POVERTY

	1989			**1993**			**1996**		
	Elasticity wrt[1]			**Elasticity wrt**			**Elasticity wrt**		
Poverty Measure	Value	Mean	Gini	Value	Mean	Gini	Value	Mean	Gini
Head Count	45.1	-1.08	0.58	42.9	-1.37	0.60	54.9	-1.17	0.22
Poverty gap	18.3	-1.47	2.32	15.2	-1.82	2.24	19.8	-1.77	1.52
Sq. Poverty gap	9.7	-1.79	4.03	7.2	-2.21	3.85	9.4	-2.19	2.79

1/ Elasticity of each of the poverty measures with respect to mean per capita expenditure holding distribution constant, and with respect to the Gini coefficient holding mean per capita expenditure constant.

What is the impact of distribution-neutral growth on poverty in Jamaica? The elasticities with respect to mean consumption are all greater than one in absolute value – a one percent increase in mean consumption will lead to a more than one percent decline in poverty (in 1996 for example, the headcount index would fall by 1.17 percent). Hence in Jamaica, distribution neutral growth would decrease poverty. Declines in inequality would also decrease poverty, but not by as much. A one percent decline in the Gini, holding mean consumption constant, would reduce the headcount index by 0.58 percent in 1989, and by a mere 0.22 percent in 1996. Note however, that declines in inequality would have a much larger impact on inequality amongst the poor (measured by the squared poverty gap) than would increases in mean consumption that maintained the present distribution. A one percent decline in the Gini in 1989 would reduce the

squared poverty gap by 4.03 percent, while a similar increase in growth (holding the Gini constant) would only reduce this measure by 1.79 percent.

The analysis, as is, has an obvious limitation. The resource cost of one percent changes in each of growth and the Gini coefficient may not be equal, and therefore may not be comparable. Estimating those resource costs is a possible area for future research.

Notes

[1] Paraguay also evidenced a decline in inequality, over the latter part of the decade, but does not have a comparable observation from 1980.

[2] Neither Ahiram's data nor that of McClure (1977) is comparable to that presented below, nor comparable to each other. Ahiram uses gross formal labor market income, excluding capital income, income in kind, home production, and informal activity as the basis for his computation of inequality. McClure uses gross labor market income from all activities plus the imputed value of home production.

[3] The full sample Theil indexes in Table 4 and Table 5 may not match those given in the other tables because some missing values for education and sector of employment resulted in slightly smaller samples.

[4] Region is broken into two categories in Table 7, but three categories (Kingston, other towns, rural) are used in the ANOVA presented in Table 10.

[5] Since annual household surveys for Jamaica began only in 1989, it is not possible to speak definitively about distributional changes before that time.

[6] The assertion is difficult to evidence because the response rate to the relevant question in the household survey is poor.

[7] The calculations were made with the POVCAL software package. Thanks to Gaurav Datt for making this available to us.