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Methods for Measuring the Effect of Adjustment Policies on Income Distribution

Anne Maasland

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This paper — a product of the Macroeconomic Adjustment and Growth Division, Country Economics Department — is part of a larger effort in PRE to analyze the impact of adjustment programs on income distribution. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Patricia Dixon, room N11-025, extension 39175 (37 pages).

Maasland reviews the different methods for measuring how adjustment affects the distribution of income and characterizes them as qualitative or quantitative — and general equilibrium or partial equilibrium.

No single integrated model can answer all questions. The most practical approach for a particular country depends on the issues that the country faces — and available data and resources.

In a data-poor country with no microsurveys or good macrodata, a more qualitative, partial-equilibrium analysis will be required.

If the country has a microsurvey, poverty profiles can be quantitative and more detailed.

In a data-rich country, macroeconomic and microeconomic data can be combined to construct a computable general equilibrium model with which to generate quantitative estimates of the impact of adjustment policies.

Between these extremes, other methodologies may be applicable — depending on the availability of data and the particular focus of the reform program. Partial analysis may be relevant if a country faces special issues.

Maasland found that a study of the effects of macroeconomic policy on distribution will benefit from an analysis of microeconomic issues that address how the poor and other groups respond to the changed environment after adjustment. These responses can significantly affect the outcome of real incomes and poverty. The importance of these feedback effects suggests that wherever possible, general equilibrium effects should be considered.

Methods for Measuring the Effect of Adjustment Policies on Income Distribution

by
Anne Maasland

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1. Introduction

The effect of adjustment policies on different groups in the population is an important and complex issue. The distributional implications can have a large influence on the sustainability of programs. In particular, there is a need to identify how different groups in society are affected by an adjustment program and how an alternative mix of policies would affect this outcome. This assessment will be useful for developing compensation schemes for those groups that may be negatively affected in the transitional adjustment period, and in generating support for adjustment programs.

A related issue is the effect of adjustment programs on the poorest groups of the population.[1] In some countries these poor groups provide needed political support; in other countries the poor do not have political power, but they are still important in the government's social welfare function. Furthermore, poverty alleviation is a development objective and a mandate of the Bank, and Bank-supported reform programs should address what the effects on the poor will be. To better determine how specific actions can be taken to protect the poor during the adjustment process, particular attention should be paid to this segment of the population in the analysis of distributional implications.

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[1]Concerns about the overall income distribution would look at the whole distribution of incomes, while concern for the poor implies a focus on the lower end of the distribution relative to a poverty line. This review looks at studies that examine either inequality or poverty.

This paper reviews the methodologies that have been suggested to study the effect of adjustment on distribution. The review provides examples of each approach, but it is not meant to be an exhaustive literature survey.[2] Each method is evaluated and data requirements are described. Table 1 summarizes the review into those methodologies that are qualitative versus quantitative, and partial versus general equilibrium.

The review provides a range of approaches and can help select a method to apply to a particular country. The complexity of the issue is such that one integrated model capable of answering all questions is infeasible. Instead, there is a menu of methodologies and the specific issues facing the country, as well as the data and resource availabilities, will determine the practical approach.

Section 2 provides a review of recent work on macropolicies and income distribution; it focuses on the methodology and not the actual distributional results. Section 3 provides recommendations and conclusions.

2. Suggested Methodologies: A Review

Ideally, the methodology for tracing the distributional impacts of adjustment policies would estimate the present value of a time profile of real

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[2]S. Stone and R. Kanbur at the Economic Development Institute of the World Bank have compiled three bibliographies of the literature on adjustment: "Poverty and Adjustment: A Literature Review", "Women and Adjustment: A Literature Review", and "Macroeconomic Models of Adjustment: A Literature Review". The latter bibliography discusses the literature on specific issues and policies in adjustment. For example, there are sections on the modeling of exchange rate policies, trade policy, financial markets, labor markets, and agricultural markets.

income for each individual under several scenarios.[3] One scenario would be the "counterfactual", the policies which would have been followed in the absence of an adjustment program, and this would be used to compare other scenarios of various adjustment policy packages. The time profile would provide a measure of the short-run costs and long-run benefits of stabilization and structural adjustment, and the discount factor would reflect the individual's preferences between consumption today and tomorrow. These present values could then be weighted according to a social welfare function to determine the optimal scenario.[4] This, of course, is an ideal methodology.

The problem is essentially how to link aggregate macrovariables to the microlevel distribution of income. There have been a variety of approaches, which reflects the large scope and complexity of the question. Varying data availability in countries have also led to the development of different approaches. Economic theory provides some guidance but it does not provide unambiguous answers, and the distributional results of particular policy will ultimately depend on country-specific economic structures and parameters.

There are at least three main difficulties in trying to isolate the effects of adjustment policies on income distribution. First, there is the problem of identifying the counterfactual: it is inherently difficult to determine what would have been the distributional outcome in the absence of adjustment policies.

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[3]More realistically, the present value of real returns to different socioeconomic groups would be estimated, along with some measure of how the variance of the intragroup distribution changes, under different scenarios. The price deflators should reflect the consumption basket of each socioeconomic group.

[4]For analytic ease, the information contained in the income vector could be collapsed so that the social welfare function is a function of mean per capita income, an inequality measure, and an absolute poverty measure.

This counterfactual scenario is needed to decide whether alternative policies would have done better or worse, to isolate the effects of adjustment programs from other factors, and to establish causality. Second, data on factor rewards and factor endowments, and socioeconomic data on the living conditions of the poor, are scarce and often of dubious quality. Many of the poor work in the informal sector, but output and other informal sector data are usually not included in official statistics. Third, analyses of adjustment programs must look at both the potential short-run costs and the long-run benefits. For many countries, the elapsed time following adjustment is still too short to measure the long-term benefits, and the uncertainty of long-run benefits may make them more difficult to model than the short-run costs.

2.1 Qualitative Approaches: General Equilibium

Qualitative, general equilibrium models are valuable as a framework for thinking through the issues involved, while incorporating feedback effects. They help to identify the relevant variables in the analysis, and are useful regardless of the data situation. For example, the dependent economy model discussed below, points to the need to identify the factor intensities of the sectors whose relative price has changed.

a. Dependent Economy Model

Most qualitative approaches use the dependent economy model to describe the theoretical effects. This is a general equilibrium, full employment model that focuses on the real exchange rate.[5] In its simplest form, there are two

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[5]This model was originally derived by Salter and Swan and has been called the Australian model. A description of the trade model is Mussa (1974) which derives the important parameters for measuring the effect on factor incomes. Recent summaries in the context of adjustment are SDA (1989), Demery and Addison (1987, 1988), Edwards (1988), Corden (1986), and Knight (1976). These summaries

goods (tradables and nontradables) and two factors (capital and labor). The long-run result, when both factors are mobile, is that an increase in the price of tradables to the price of nontradables (a real depreciation) will increase the return to the factor used more intensively in the production of tradables (see Corden, 1986).[6] This is analagous to the Stolper-Samuelson treatment of the effects of a tariff in the standard neoclassical trade model. The percent change in the return of this intensively used factor will be larger than the percent change in the price of tradables, and that factor will gain in terms of all goods. Thus if tradables are labor intensive, a real exchange rate depreciation will increase the real wage.[7] Since wages are generally distributed more equally than returns to capital, income distribution would then improve.

In the short-run, when labor is mobile but capital is specific, the predicts that an increase in the price of tradables will increase the return to capital in the tradables sector, decrease the return to capital in the nontradables sector, and have an ambiguous effect on wages. The real wage relative to the price of tradables will fall and the real wage relative to the price of nontradables will rise. Thus the overall effect will depend on the consumption basket of workers: if workers consume a sufficiently high proportion

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discuss extensions such as wage rigidities, the addition of other sectors such as importables, formal and informal markets, and the addition of other factors.

[6]The simplifying assumptions required are perfect competition, well behaved production functions, profit maximization, and no externalities.

[7]Pure international trade theory predicts that countries opening to trade will export goods whose production is intensive in factors with which they are abundantly endowed. In most developing countries labor is the abundant factor so openness to trade should improve the return to labor. However, this is qualified by the fact that exports are often due to a specific factor such as land or minerals, not abundant labor. The theory is discussed in Krueger (1983), and is extended to include distortions in the goods and factor markets.

of nontradables, then the real wage will rise following a real devaluation.

In the very short-run, when all factors are specific, the impact effect of a real depreciation is to increase the returns to factors engaged in tradable production and decrease incomes in the nontradable sector. If factor returns are fixed in the very short run, then extraordinary profits will accumulate to the owners of tradable production.

There are a number of reasons why the standard dependent economy model may not be a sufficiently realistic representation of an economy. First, there are usually more than two factors of production. Many developing countries export goods using their comparative advantage not in abundant labor but in specific factors related to the production of agricultural exports or mineral exports. Thus the model for these countries should include three factors: capital, labour, and a specific factor such as land or minerals.[8] A second example is that many countries require intermediate imports as a factor of production.[9] A third example is a labor force that is not homogenous, implying at least two additional factors of production: skilled and unskilled labor.

There is a large literature on the generalization of the model to many factors and many goods, which will not be reviewed here.[10] The Stolper-Samuelson theorem is not fundamentally altered when there are many goods and two factors. However, when there are also many factors, the results are less specific, although it can still be shown that there is a positive correlation between

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[8]See Krueger (1983) and Jones (1971).

[9]Lal (1983, 1984) describes a two good (tradables and nontradables), three factor (labor, capital, intermediate imports) model and applies this model to the case of Philippines.

[10] See the survey by Ethier (1984).

factor returns, and factor intensity and prices: factor returns increase for factors used most intensively in the production of goods whose relative price has increased the most, and for factors used least intensively in goods whose relative price has fallen the most.

A second problem is that full employment is not an accurate assumption and perfect factor mobility often does not hold. In other words, the assumption of perfect competition in goods and factor markets is not realistic. There are numerous examples of imperfections in markets in developing countries: segmentation in labor markets, credit market rationing, and so on. Krueger (1983) discusses extensions of the model to include distortions in goods and factor markets, and Edwards (1988) incorporates labor market distortions.

A third problem is the translation of the results on factorial distributions of income to the personal distribution of income. Although labor is the most important factor owned by the poor, they may also own some capital, and factor ownership (or asset endowment) may vary over time. To measure changes in asset endowment over time, investment processes by different socioeconomic groups need to be measured.

A fourth problem is that the model describes the real economy and does not include a monetary sector. This implies that the effects of nominal variables are not incorporated. For example, the contractionary effects of a nominal devaluation are not addressed, since the model focuses on the real exchange rate. Also, mechanisms such as price formation through the money supply, and asset portfolio behaviour are not incorporated. The model has been extended by Dornbusch (1980) and Lal (1984) to include a monetary sector.

Despite the problems, this model can be usefully applied to consider the medium term consequences of a development strategy that increases openness to

trade. The model suggests that factor usage in different sectors should be examined to determine if labor will benefit from increased incentives towards exports. Bourguignon and Morrisson (1989) provide country studies that show how the analysis can be done. They are partial equilibrium studies and are discussed further in the next section.

2.2 Qualitative Approaches: Partial Equilibium

If countries have little data, then a qualitative, partial equilibrium analysis may be a useful supplement to the general analysis discussed above. Furthermore, some countries may have specific issues that need to be examined in more detail, and this may warrant a partial analysis.

a. Sectoral Analysis

Bourguignon and Morrisson (1989) provide detailed case studies on external trade and income distribution.[11] These studies do not analyze adjustment policies directly, but to the extent that adjustment policies often encourage a strategy of openness to foreign trade, these studies are relevant. The case studies include substantial data analysis, but since they do not come up with a quantitative measure of the change in the income distribution due to expanding trade, they are categorized as qualitative research. The authors first lay out a theoretical background to describe a model which implies that a sectoral analysis of policy effects on income distribution can be used. They then measure the impact of the export sector on distribution, relative to sectors oriented towards the domestic market for nontradable commodities or import substitutes. They suggest using a summary measure of the income distribution that is

[11]The country studies are on Costa Rica, Malaysia, Malawi, Morocco, Peru and Taiwan.

decomposable by sectors to examine how growth in the export sector will affect the overall income distribution. Following the case studies, there is a discussion of some general equilibrium effects: the feedback of income distribution on the demand for imports and the indirect effects of exports on income distribution. These studies are useful for answering the question of whether a development strategy of openness to trade will improve the income distribution.

b. Poverty and Income Profiles

There are a number of papers that consist of, or include, a verbal description of the likely effects of each potential adjustment policy.[12] These papers divide adjustment policies into monetary and credit policy, fiscal policy, price policy, labor market policies, exchange rate policies and other external policies, and describe likely effects on certain socioeconomic groups. The descriptions are of the immediate, direct impacts of each policy separately. In general, the results are dependent on specific characteristics of the country and on the economic beliefs of the authors, as reflected in the perceived mechanisms through which policy affects economic variables.

Papers by the Fund (1986, 1988) and the Bank (1987) suggest that a partial analysis (the direct impacts) of the effects of key policies on particular socioeconomic groups is the most practical approach. They suggest identifying socioeconomic groups and distinguishing economic effects of adjustment in terms of the sources and uses of the income of these groups (that is, the different production and expenditure patterns).

For example, the IMF (1988) conducted a qualitative empirical analysis of

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[12]Examples of such studies include Azam, et al (1989), IMF (1986,1988), Scobie (1989), Helleiner (1985), and Demery and Addison (1987).

effects of adjustment policies in seven countries.[13] The methodology is to first identify key socioeconomic characteristics of poverty groups that are sensitive to adjustment policies. These characteristics include their production activities, consumption patterns, holdings of land and other assets, accessibility to government services and to formal markets, and other relevant information. Second, the causes of macroeconomic imbalances are analyzed, and third, all policy measures taken during the course of the program are examined. Fourth, the short-run impacts of particular adjustment measures are evaluated by analyzing the economic consequences for the poor in terms of the sources and uses of their income. Fifth, the medium- to longer-term impacts of structural changes on the earning capacity of the poor are assessed. The authors state that the effect on the uses side will be primarily short run, whereas the sources side will have to be analysed for the longer run since structural adjustment will have long-term effects on incomes. This framework is used in a very general qualitative analysis of seven countries.

A more detailed analysis is by Glewwe and de Tray (1988, 1989) who use Living Standard Measurement Surveys (LSMS) to identify key socioeconomic groups and their production and consumption patterns for Cote d'Ivoire and Peru. They create a detailed quantitative poverty profile and then do a qualitative analysis of the first round, direct effects of a change in policies (the short-term transitional costs of adjustment). This is done by identifying how the poor would be affected by policies through changes in incomes from rural and urban employment, changes in market prices of consumption goods, and changes in the level or quality of government services.

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[13]The seven countries are Chile, Dominican Republic, Ghana, Kenya, Philippines, Sri Lanka and Thailand.

Although many countries may not have comprehensive surveys, the Country Economic Memorandum for Malawi (1990) demonstrates what can be done in a data-poor country. The Memorandum focuses on growth through poverty reduction. A poverty profile is constructed from several small surveys for smallholders, estate households and urban households. Next, six major factors, with supporting data, are suggested for why these people are poor. This leads to a discussion of four proposals to alleviate poverty, supported by analyses of the current situation of the labor market, social sector expenditures, and tax and transfer policies. Finally, the quantitative effects of the four poverty alleviation proposals on incomes, poverty, and growth are estimated separately, and tradeoffs and complementarities of the four approaches are discussed within one macroeconomic framework.

The UNDP and the Social Dimensions of Adjustment (SDA) project in the African region recommend analyzing the adjustment process by identifying the transmission mechanisms from macro policy to the micro economy. That is, the country situation is analyzed to identify the ways in which the different components of a macroeconomic reform affect the situation of the poor. A quantitative set of indicators, or intermediate variables, are then identified to recognize changes to the poor. These indicators reflect both the policies pursued and the structures within which they are applied. Examples of such variables would be the unskilled wage, the agricultural terms of trade for peasant producers and the price of food staples. The impacts of macropolicy on these intermediate variables could be analyzed either qualitatively (UNDP) or

quantitatively (SDA).[14]

2.3 Quantitative Approaches: General Equilibrium

If an analysis of different policy scenarios, such as different mixes of policy, different timing of policies, or no adjustment policies, is desired, then a model must be constructed to perform simulations. The complexity of the micro-macro interrelationships would suggest that models of a general equilibrium nature be used.

a. CGE Models

One approach to tracing macro effects to individual incomes is that of a behavioural model (such as a SAM/CGE model) which incorporates details on factor and household behaviour.[15] The social accounting matrix (SAM) is a data accounting framework that immediately draws together the relevant base year information: the structure, composition and level of output, the factorial value added, the distribution of income among institutions and among socioeconomic groups, and the consumption patterns of these institutions and groups. The construction of the SAM alone will yield essential information for any type of further analysis, including a simple partial qualititative analysis of likely policy effects. To analyse alternative policy scenarios, behavioural equations

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[14]The paper by N'Cho-Oguie (1989) lays out the sequential model building method proposed by the SDA unit. The RMSM model for Togo is currently being upgraded to include distributional measures. Policy variables are input and GDP by sectors are output. These GDP values are allocated to different socioeconomic groups by fixed coefficients using data from a household survey. The model is still largely an accounting model.

[15]This is the approach that will be taken by the forthcoming Cornell study on adjustment in Africa, see Scobie (1989). This approach is well summarized and recommended by Thorbecke and Berrian (1987). Although some CGE models do not explicitly start with a SAM, such an accounting framework is implicit in the calibration of the model.

can be added to create a SAM/CGE.

A potential problem is the data and time requirements: construction of a SAM typically requires an input-output table, national income accounts, and information from a household survey on patterns of consumer spending. An analysis of fiscal revenue and expenditure incidence is needed to account for changes in the government budget that accompany most adjustments. Additional data are required for parameter estimates. If these data are not available and estimates are made, then the model may move away from the reality of the country. Furthermore, if large structural changes are to be simulated then the exogenous parameter values based on historical estimates may not be relevant; behavioural parameters estimated under the old regime may not reflect behaviour in the economy following structural adjustment.

Although some CGE models do not explicitly start with a SAM, the data requirements are implicitly the same. Data are required for the estimation of parameters and exogenous variables, to replicate a historical set of data. When data are lacking, CGE models often use "borrowed" parameter values, parameters estimated in similar income countries. Results can be sensitive to this calibration. If sensitivity analyses are performed, they are usually done on only one parameter at a time and can result in changes in the optimal policy rankings for objectives such as growth.[16] If all possible combinations of parameter values are simulated, the output results could have a large range of

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[16]For example, de Janvry, Fargeix, and Sadoulet (1989) estimate a model for Ecuador and include sensitivity analyses. They assess how the optimum policy for growth is affected by a high and low effect of inflation on investment, a rigid or more flexible financial sector, and so on, relative to a base run. Changing only one parameter relative to the base run, alters the long-run optimal policy for growth in every scenario. They do not simulate combinations of parameter changes, such as a high impact of inflation on investment combined with a flexible financial sector.

values. This implies that reliable parameter estimation, and good underlying data in particular, are critical for dependable policy recommendations.

The CGE will provide the sectoral pattern of factor employment and the resulting factorial (functional) income distribution. To map these incomes to the socioeconomic groups requires data on the household's factor endowments (the amount of land, capital and human capital owned by the different groups) and its sector of activity. In order to make these models dynamic, factor endowments should be made endogenous. This would require models of investment processes in land, capital and education for each of the socioeconomic groups, a difficult empirical task. A second issue is identifying the sector of activity for the household. Surveys consistently show that households earn income from a variety of sources, for example, agricultural households may supplement their income with non-agricultural activities in the off-season. Over time, the shares of income received from these two sectors can change and the model should incorporate such changes. These two issues are difficult and not addressed in most models; they are often handled by specifically selecting socioeconomic groups that are essentially extended functional distributions. Groups are defined according to their function and sector of activity, thus ignoring multiple income sources.

The CGE provides results on the mean income of different socioeconomic groups, but to measure the impact on poverty, some estimate of how this income is distributed within the group is also needed. For example, if the mean real income of small farmers increases, it is not clear that any of the poor small farmers receive the increase. The importance of changes in intergroup variance (the portion explained by the model when it produces mean incomes) varies by country and by the selection and number of socioeconomic groups. Bourguignon, et al (1983) found that in Venezuela, 33% of the total inequality of labor

incomes is explained by the intergroup variance, where the groups are defined by decomposing the population into sectors of economic activity and occupational status. He estimates that including wealth-related income should increase the intergroup variance to 50% of the total variance. However, Glewwe and de Tray (1988,1989) estimate that only 15% and 25% of consumption inequality for Peru and Cote d'Ivoire respectively, is due to variation in consumption between socioeconomic groups. Information about intragroup variance can come from survey data or by assuming a frequency density function. Dervis, de Melo and Robinson (1982) and Thorbecke and Berrian (1987) discuss ways to generate the change in the intragroup variance from the model.

There are numerous examples of CGE models and a bibliography is available in Decaluwe and Martens (1988) and Devarajan, Lewis and Robinson (1986).[17] Recent examples which emphasize distributional issues are listed below. Some general conclusions are that the size distribution of income has been found to be insensitive to policy, but the extended functional distribution that distinguishes classes of income recipients by sector as well as by asset ownership, is sensitive to policy.[18] Another general result is that structural differences in economies can lead to different winners and losers when the same adjustment policy is enacted.

De Janvry, Fargeix, and Sadoulet (1989) have developed a CGE model to study

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[17]There are at least two such CGE models that are available in a "user-friendly" form on diskette: the Bourguignon, Branson, de Melo (1989) model described in the text and a fix-price, flex-price model by Maasland and Taylor (1987).

[18]Thorbecke (1985) suggest two major reasons for the stable size distribution of income. First, most of the policy simulations are conventional marginal changes in policy rather than structural reforms. Second, the household income distribution is mechanically mapped from the factorial income distribution.

the choice, mix and timing of instruments for adjustment and have applied it to Ecuador. The consequences for economic growth, welfare of the poor, and political responses are examined. The model includes a financial portfolio model to endogenize the inflation rate and the interest rate. There are three labor types with a low elasticity of substitution (0.2), and low substitution between total employment and fixed capital (0.4), reflecting rigidities in factor reallocation. The unskilled wage is fixed with surplus labor, and the skilled wage is fixed in the short run, but clears the skilled labor market in the long run. A foreign exchange constraint imposes a flexible exchange rate regime with devaluation endogenously determined for a given level of capital inflow. The shock to the economy is modeled as a drastic decline in the foreign exchange inflow. The instruments controlled by the government are fiscal expenditure levels, allocated between current and capital expenditures, and monetary policy through the reserve ratio and the allocation of the financing of the deficit.

The results are that cuts in current (not capital) fiscal expenditures are best for long-run growth (in most cases), but are politically difficult because current expenditures mostly benefit skilled employment in public services, which contributes to income for the urban medium and high education groups. Monetary restraint has more diffuse income effects and thus is politically easier, but is worse for growth because private investment declines as interest rates rise. In the longer-term, however, inflation control from monetary restraint has a beneficial effect on investment. No adjustment in fiscal or monetary policy, which forces a sharp devaluation in the exchange rate in response to the drop in the foreign exchange inflow, has less short-run growth costs but worse long-run growth results. This occurs because wages are only partially indexed so in the short-run, real wages fall and output growth is maintained. In the longer

term, excessive fiscal deficits cause interest rates and inflation to rise, with a resulting fall in output growth.

These policies have different effects on sectoral poverty. Rural poverty is best aided with fiscal cuts in current expenditure, but urban poverty suffers in this scenario from the loss of public goods benefits, demand contraction, and exchange rate devaluation. The result is a policy conflict: the rural poor and the state (which prefers growth) favor current fiscal cuts, and the urban poor and the politically dominant urban middle and rich prefer no adjustment in the short run or, as a second best policy, monetary contraction. These type of conclusions reflect the advantages of the CGE model: specific quantitative results are made available which account for feedback effects and which keep consistent account of all incomes and expenditures.

Bourguignon, Branson, and de Melo (1989a, 1989b) have developed a macromodel and Bourguignon, de Melo, and Suwa (1989) use it to simulate adjustment for two archetype economies: a low income African country and a middle income Latin American country.[19] They find that initial characteristics of the economy affect the distributional results, as do institutional characteristics, such as low supply and demand elasticities and the rigidity of the labor and commodity markets. General results are that devaluation helps the poor (especially in the low income country) because they are located in the exporting industry, import rationing worsens inequality because premiums accrue to capitalists, and uniform government expenditure cuts have little effect on income distribution in the low income country but are bad for the middle income

[19]The Bourguignon, Branson, and de Melo model has also been applied to Morocco, Cote d'Ivoire, Malaysia, Indonesia, and Ecuador at the OECD Development Centre.

modern sector workers. With real wage and price rigidity, government expenditure cuts cause a great increase in inequality and in the number of poor because of unemployment and lower growth, and because capitalists are better able to protect their income since markup pricing protects profits.

A similar model, with special emphasis on distributional issues is by Dervis, de Melo, and Robinson (1982) and de Melo and Robinson (1982) who use a CGE model for three archetype economies: a primary exporter, a manufacturing exporter and a closed economy. They find that the distributional implications of an external shock depend on both the initial structure of the economy and the choice of adjustment policy.

The Adelman and Robinson (1988) paper investigates the issue of whether macro closure rules affect the distributional outcome of the model. They set up a CGE model that is general enough to incorporate different investment-savings and balance of payments closure rules, and apply it to two economies similar to Brazil and Korea. The Keynesian closure is that real investment is exogenous and output (and savings) adjust through the real wage and labor demand, to ensure equality of investment and savings. The alternative closure is that nominal investment is exogenous, and both real savings and real investment adjust through the aggregate price level and there is little real output effect. The latter closure rule is potentially more neutral in its effects on the functional income distribution since it does not affect employment and output, and instead, it involves proportional changes in savings rates across income classes. The alternative balance of payments rules are a variable exchange rate (for a given balance of payments), and a fixed exchange rate which affects the balance of trade and, thus, aggregate savings. They find that the size distribution is insensitive, but the functional distribution is very sensitive, to macro closure

rules. They also find that the balance of payments closure is at least as important as the savings-investment closure rule for the distributional outcome.

b. Cross-country Econometrics

Beyond CGE models, a second methodology is a cross-country econometric analysis which will yield the average effect of adjustment programs. This is the approach used in the World Bank's Report on Adjustment Lending II (1990). Countries are divided into those that received several adjustment loans beginning in the early 1980s, and those that did not. The econometric procedure isolates the impact of adjustment lending programs on selected performance indicators such as GDP growth, and investment, savings, and export ratios. This is done by separating out the effects of external shocks and pre-program conditions, accounting for policies that would have been followed in the absence of an adjustment program, and accounting for the bias resulting from countries selecting themselves into the program.

This kind of analysis could be applied to distributional types of variables if these data were available for a sufficient number of countries. For example, the procedure was applied to real private consumption per capita growth (which reflects aggregate living conditions) and it was found that consumption growth rates improved following adjustment programs (but at the expense of investment). If cross-country data were available on poverty or quintile distributions of income, before and after adjustment, this methodology could isolate the impact of adjustment programs on distribution.

This analysis will reveal the average effect of adjustment programs on all countries receiving adjustment lending, but it is not detailed enough to provide information on how a performance indicator is affected by a single policy or by an alternative adjustment policy package. This is because all types of

adjustment programs are aggregated into a single indicator. Potentially this analysis could be refined to isolate certain broad policies such as trade liberalization, fiscal management, and so on.

c. Intertemporal Optimizing Models

A third methodology is an intertemporal optimizing model, as in Bourguignon (1989). The paper analyzes poverty reduction in an applied optimal growth framework (using a model from the tax literature) which emphasizes the tradeoff between current poverty reduction and growth. The model traces the outcome of policies on three variables, the consumption of the poor, the consumption of the nonpoor (the political cost), and growth. The current costs of transfers to alleviate poverty are leakages to nonpoor groups and efficiency losses from reallocating expenditures away from more productive uses. The future cost is due to a reallocation towards low savers, which will reduce investment. A third tradeoff is between reducing poverty with current transfers or by increasing the productivity of the poor. The model has an aggregate production function that traces the effect of investment on output, a module that describes the distribution of income according to the ownership of factors of production, parameters that define distributional consequences of taxes and transfers, and a "cost" function which measures GDP efficiency loss from taxation.

The model does not specifically trace the impact of adjustment policies on distribution. Instead, it starts with a concern for the poor and analyzes the tradeoffs involved for improving their consumption. In particular, the model examines these issues during a period of adjustment, following a permanent adverse shock, when the marginal productivity of capital is momentarily much higher. The shock causes a drop in all incomes, and redistribution policies are severely limited by the need to increase investments for the structural

adjustment to take place. The economic and political costs associated with current transfers are significant after a permanent shock, and simulations suggest that it may be optimal to start redistribution later in the adjustment period.

d. Reduced Form Econometrics

A fourth methodology is a "reduced form" econometric analysis by Blejer and Guerrero (1988). Using quarterly survey data and quarterly national income data from 1980-86 for the Philippines, the ratio of the share of income of the lowest three deciles to the share of income of the highest decile is regressed on productivity, underemployment, the real exchange rate, real government spending, a time trend, the real interest rate, and inflation. The results for the Philippines are that underemployment, inflation and government spending are regressive and productivity gains, the real interest rate and the real exchange rate are progressive.[20] The authors use these results to conclude that a larger drop in the real exchange rate would have reduced poverty, and that reducing inflation, increasing real interest rates, and reducing (regressive) government expenditures tend to improve the income distribution.

While this econometric model is useful for estimating the "net" effect of a policy, the link between the policy and resulting incomes is unclear. The coefficients are similar to "multipliers", they measure the total effect of the exogenous variables, but do not provide information about the transmission mechanisms. They do, however, provide knowledge about the magnitude of the tradeoff between policies on income distribution. For example, underemployment has a slightly stronger negative effect than inflation on the relative income

[20]The results are the same when the LHS variable is the real share of the lowest quintile (absolute poverty).

shares, suggesting that the former is more important for the relative incomes of the poor.[21] The method is straightforward to implement; however, time series data on income shares by deciles are not available in most countries making this method unlikely to be duplicated in other countries.

2.4 Quantitative Approaches: Partial Equilibrium

If a country is undertaking a sectoral adjustment program, then a partial analysis of that sector will provide more detail and will be useful for evaluating the program. Also, in countries where agriculture accounts for a large part of GDP, a partial examination of the agricultural sector will cover most of the activity. Finally, if a country has a specific issue that needs to be examined, a more partial approach is relevant.

a. Sectoral Models

Sectoral models typically provide a partial equilibrium analysis of a particular sector, usually agriculture. They are useful for examining agricultural price reform and policies targeting the rural poor, and are most useful for countries in which agriculture constitutes a large share of GDP. An example is the Quizon and Binswanger (1986) model for Indian agriculture which focuses on income distribution. The model has detailed output supply, factor demand and output demand equations for the agricultural sector, and prices and quantities clear the markets. This model has limited links to the rest of the economy and the nonagricultural sector is exogenous, and so they call it a

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[21]A study by Blank and Blinder (1985) for the U.S. shows that unemployment is strongly regressive and inflation is weakly progressive. If the government cares about incomes of the poor they should concentrate on generating employment and not worry about the potential inflation tradeoff. For the Philippines, the tradeoff between underemployment and inflation is much weaker, and so the policy implications are less clear.

limited general equilibrium model. They measure the impact of the Indian Green Revolution and the effect of alternative government policies on income distribution.

b. Time Series of Indicators

A second method, used by Behrman and Deolalikar (1989) in a study on Jamaica, analyzes time series of indicators. They estimate the secular growth of available indicators and test whether significant shifts in the relation occurred during the adjustment period.[22] In a rough way, this method identifies whether the adjustment period differed from the secular trend, as opposed to being a period of poor performance as part of a longer experience. They find that controlling for past trends leads to a much less negative assessment of adjustment impacts than other authors had found. Their analysis is a rough attempt to try to separate the counterfactual from adjustment policies, but it cannot clearly establish causal effects of adjustment programs, because there is no control for other variables that may affect the indicator of interest. They supplement these regressions with labor market analysis and real wage analysis and also look at trends in transfers. Finally they examine food and nutrition, education, health and anthropometric evidence more closely. They regress expenditure relations for food and calculate food and nutrition elasticities, and use these to calculate the nutritional effects from changes in income.

c. Fiscal Incidence Studies

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[22]That is, they test whether the adjustment period was just part of a longer experience of bad years by regressing the variable on time, time squared and a dummy for the adjustment period and testing the significance of the dummy.

Fiscal incidence studies are quantitative studies which measure revenue burdens and expenditure benefits by different income groups. At best they estimate the effective incidence (the ultimate tax or expenditure effect) rather than the statuatory incidence, which is based on the letter of the law.[23] The effect of a change in fiscal expenditure is then measured by mechanical calculations based on the accessibility to government services by socioeconomic groups. Behavioural responses are not incorporated and as such, the utilization of incidence studies is not of a general equilibrium nature.[24] Furthermore, the incidence studies focus on secondary incomes, or transfers of taxes, subsidies, remittances; the effect of fiscal actions on the primary distribution of income, through changes in the demand and supply of factors and goods, are generally not included.

d. Macro Output - Micro Input

A fourth method starts with a country poverty profile and links it to a macromodel that provides output on intermediate variables such as wages, employment, and prices. This would be a partial equilibrium analysis because it measures the impact of the intermediate variables on poverty, but would not incorporate the feedback from the poverty to the macromodel. A study by Youngblood, et al (1989), commissioned by USAID on El Salvador, uses this methodology. They develop a three sector macromodel (importables, exportables, and nontradables) and estimate three econometric equations for the value added of each sector. The economic reforms are represented as changes in the relative

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[23]See Catsambas (1988) for a discussion on the issues and problems in fiscal incidence studies.

[24]However, current research by Emmanuel Jimenez at the World Bank is examining behavioural responses to social expenditure programs and the implications for policy.

prices of these sectors. The price changes, and the resulting changes in the sectoral value added, are then translated into changes in the wage incomes and food costs of the socioeconomic groups. Unfortunately this latter link is not well described in their paper. This method allows for the use of an econometric approach on the macro side. It also may permit the use of existing macromodels, as long as the important intermediate variables are endogenous.

e. Microdata Analysis

There are a number of methodologies that examine household microdata. Some of these can be used in combination with the previously described method, which links a macromodel with a micro analysis. Kanbur (1987a, 1987b) suggests the following approach. First, using a household survey, create a poverty profile that is disaggregated by socioeconomic groups that are relevant to the policy instruments (for example, groups involved in tradable vs. non-tradable production to study a devaluation). The poverty index should be decomposable by groups so that the poverty indices can be aggregated into total poverty, and the index should be sensitive to the "depth" of poverty within the poor.[25] Next, assuming that policies of expenditure reduction or expenditure switching feed into individual incomes either additively or multiplicatively, Kanbur calculates closed form solutions for the elasticities of sectoral poverty with respect to income (and relative price) changes. Using a macroeconomic projection of the impact of policies on sectoral incomes, these elasticities can then be used to estimate the effects on poverty. The analysis is static and only appropriate for small changes in income, and the feedback of poverty changes back to the economy are not included, making this a partial equilibrium analysis. This

[25]There is a growing concensus on the use of the Foster, Greer, Thorbecke (FGT) poverty measure. See Kanbur (1987a, 1987b).

method focuses attention on the micro implications of a change in income, however, it still requires projections of changes in sectoral income which may require a macromodel.

Kanbur's method assumes that within-sector income distributions do not change. Thus if a worker moves from non-traded to traded production he takes on the income distribution characteristics of that sector (that is, poverty is not based on the individual's characteristics). A second assumption is that policy changes are assumed to enter additively or multiplicatively on all incomes in order to calculate the derivatives. A third assumption is that only wage earners are poor, so profit income can be ignored in the derivation of expenditure switching elasticities (relative price changes).

Kanbur (1988) applies this microdata method to Cote d'Ivoire. A poverty profile of Cote d'Ivoire is analysed using an LSMS survey for 1985. Per capita expenditure is used to create poverty indices by geographic region and by socioeconomic group. Elasticities of poverty with respect to aggregate income are calculated for the different groups. Cote d'Ivoire has a CGE already built and it is used to simulate alternative policies, obtain the change in real household income, and apply the elasticities to obtain poverty changes by socioeconomic group. The use of a CGE is not central to his method, but some projections of sectoral growth rates are needed.

The results from the dependent economy model described in section 2.1 has led Kanbur (1989b) to suggest the following data analysis, which requires survey data. A number of income profiles could be constructed along the following lines. For the very short run effect, the distribution of entrepreneurial income by production sector could be calculated. For the short run, income distribution among the unemployed, by sector, would be needed. This is because in the short

run, unemployment will increase in the nontradable sector if real wages are downwardly rigid. For the medium to longer run, as wages finally fall and as labor and then capital become mobile, income profiles by production sector and by factor are needed. From these income profiles, decomposable poverty measures could be calculated. The impact on poverty from income changes or relative price changes due to shifts in macropolicy could then be estimated using the elasticities described above.

Ravallion and Huppi (1989) analyze two household surveys from Indonesia that cover the period before and after an adjustment program. They use recent results from theoretical research on poverty to calculate several poverty measures and to rank these measures over a range of poverty lines. They conclude that poverty and undernutrition declined from 1984 to 1987 for a number of poverty lines and measures. Next, the causes of the poverty decline are examined. First, the change in poverty is decomposed into urban and rural poverty changes, population shifts between the two sectors, and interaction effects between population shifts and poverty changes. Rural poverty declines are found to be very important, suggesting that adjustment policies (such as devaluation) have improved returns to this sector. This sectoral decomposition could be done for other sectors as well. Second, the change in poverty is divided into changes due to movements in mean consumption and to movements in inequality. Most of the poverty reduction is due to growth in mean consumption; the contribution of improved equity is smaller.

The paper then investigates the importance of initial conditions. Point elasticities of poverty with respect to changes in mean consumption, for fixed inequality, are calculated for 1984. The Indonesian data show that poverty reduction is elastic (with estimates ranging from -1.3 to -3.4) to changes in

mean consumption, with inequality constant. Furthermore, for this data, a higher mean and a decrease in the Gini imply an increasingly elastic response of poverty to further growth. Thus the authors argue that the history of equitable growth has led to a situation in 1984 in which poverty responds elastically to future growth. An analysis of conditions in 1987 also reveal an elastic responsiveness of poverty to changes in the mean consumption, holding the distribution of consumption fixed. However, simulations of growth, first holding the distribution constant and then worsening the distribution to the inequality level of 1984, reveal that poverty declines from growth can be strongly mitigated by small changes in inequality.

Kakwani (1990) also uses microdata to analyse changes in poverty from changes in the mean income (growth) as well as changes in the income distribution (changes in the Gini). He calculates the tradeoff between growth and inequality on poverty and finds that, for Cote D'Ivoire the elasticity of poverty with respect to inequality is larger than the elasticity with respect to growth. However, since changes in the Gini are much less than changes in growth, the larger elasticity of the Gini will still have a lower total effect on poverty. The elasticity analysis is repeated for regions and for occupations in Cote d'Ivoire. Changes in total poverty can be calculated by using estimates of regional or occupational growth rates from adjustment policies and applying the elasticities to these rates (assuming that inequality within the regions/occupations does not change). The change in total poverty can be divided into changes due to average growth and changes due to sectoral growth differences. In Cote d'Ivoire, improvement in the terms of trade for agriculture offset the increase in poverty from general economic contraction by a significant amount.

Another micro study is one that analyzes the effects of special programs that are implemented to counter the short-run costs of stabilization policies. For example, Newman, Jorgensen, and Pradhan (1990) examine the Bolivian Emergency Social Fund (ESF), a temporary employment creation program. They use two microsurveys, a survey of the general population and a survey of ESF workers, to compare characteristics and incomes of ESF workers to other workers. They also use these surveys to simulate what would have been the position of the ESF workers without the ESF program. They are not able to consider spillover benefits of the ESF program on other workers who did not participate in the program, implying a partial equilibrium analysis. They use a microeconometric analysis of wages, hours of work, and the decision to participate in the ESF, to estimate the probability that the ESF workers would work, and the expected wages and earnings they would receive, in the absence of the ESF program. They find that the average ESF worker experiences a 27 percent increase in wages, an increase of 15.5 hours of work a week, and a 42 percent increase in weekly earnings over what would be expected (taking account of the probability of being unemployed) if there were no ESF program.

Several papers that examine the poverty impacts of price policies recommended by adjustment programs, incorporate the responses from other markets and from consumer behaviour. One such paper by Ravallion (1989) looks at labor market responses to price changes of a staple food. Many rural households are net demanders of the staple food, supplementing their own farm incomes with agricultural labor earnings. A price increase will hurt them, unless the price increase stimulates food production and the demand for agricultural labor, which then leads to higher wages. Ravallion identifies the critical value for the wage elasticity with respect to food price that ensures welfare improvement following

a price increase. He then applies the model to Bangladesh, using an income-expenditure survey and econometric estimates of the wage-price elasticity, and finds that in the short run, the rural poor are likely to be worse off after a price increase, a.' in the long run, their welfare will be neutral to such price increases.

A second paper incorporates consumer demand responses to changes in prices. Ravallion and van de Walle (1989) use a microdata set to estimate the effect on poverty of a change in the administered price of a staple food. Their method incorporates behavioural demand responses by households to changes in food prices and income. This is done by estimating demand functions, and then using these to calculate a household's "equivalent income", a money metric of household welfare. The equivalent income is the amount of income a household requires if they had the reference household's characteristics, to achieve the same utility they had before prices were changed and with their own household characteristics. This measure of equivalent income is then used to construct a poverty index, which will be behaviourally consistent since consumer demand responses have been included. Simulations of food price increases and decreases, with varying assumptions about producer input subsidies are performed.

These last several studies demonstrate that future research on adjustment and income distribution requires a closer link between macroeconomic and sectoral research, and work on microeconomic issues. The latter studies that analyze behavioural responses of consumers and producers need to be considered when tracing the effects of macropolicies.

4. Conclusion

This paper has provided a review of the methodologies used to trace the

impact of policies on income distribution. It includes a broad menu of approaches with a considerable range of detail. The complexity of the issue is such that one integrated model capable of answering all questions is infeasible. Instead, there is a menu of methodologies and the specific issues facing the country, as well as the data and resource availabilities, will determine the practical approach.

In a data-poor country without microsurveys or good macrodata, a more qualitative, partial equilibrium analysis will be required. An example of such a methodology is the IMF (1988) study which identifies poverty groups and discusses likely impacts of macropolicies in terms of the sources and uses of income for these poor groups. Additionally, an analysis of the operation of the labor market would help to understand how different groups are affected by income generating mechanisms.

If the country has a microsurvey, then poverty profiles can be quantitative and more detailed (see Glewwe and de Tray (1988,1989), Kanbur (1988), Kakwani (1990) and Ravallion and Huppi (1989)). Changes in poverty can be calculated by estimating the elasticity of a poverty index to changes in income and changes in relative prices, and applying these elasticities to regional growth rates and price changes.

In a data-rich country, macro and microdata can be combined to construct a computable general equilibrium model to generate quantitative estimates of the impact of adjustment policies. In these models, particular attention must be paid to macro closure rules. They can have significant effects on the distributional outcomes and so they need to be selected to accurately reflect the particular country situation. In addition, sensitivity analyses should be carried out for certain key parameters that are difficult to estimate from the

data.

Between these two extremes, there are other methodologies that may be applicable depending on data availability and the particular focus of the reform program. Furthermore, if a country faces special issues, a partial analysis may be relevant. For example, with significant trade liberalization programs, a partial analysis of the export sector, and its contribution to income inequality, relative to the sectors producing nontradables and import substitutes, will be important.[26] A second example is in countries that must rely on inflation for tax revenue, an inflation tax incidence study may be useful to identify which groups bear the costs.[27]

Finally, this review also shows that a study of macropolicy impacts on distribution will benefit from an analysis of microeconomic issues which address how the poor, and other groups, respond to the changed environment following an adjustment program. These responses can have significant effects on the outcome of real incomes and poverty. The importance of these responses and feedback effects implies that wherever possible, general equilibrium effects should be considered.

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[26]The sectoral contribution to incomes and employment is analyzed by Bourguignon and Morrisson (1989) and Krueger (1983).

[27]The incidence of the inflation tax on income deciles is examined by Diaz (1987) for Mexico.

TABLE 1

	Qualitative	Quantitative
General Equilibrium	- Dependent Economy model	- SAM/CGE models - Cross-country analysis - Reduced-form econometrics - Optimizing models
Partial Equilibrium	- Sectoral analysis - Poverty profiles	- Sector specific models - Time series analysis - Fiscal incidence studies - Macromodel output used as input for micro analysis - Microdata analysis

References

Addison, T. and L. Demery (1989) "Structural Adjustment and Poverty: Volume One," Social Dimensions of Adjustment Project Unit, Africa Region, World Bank.

Adelman, I. and S. Robinson (1988) "Macroeconomic Adjustment and Income Distribution," Journal of Development Economics 29.

Azam, J., G. Chambas and P. and S. Guillaumont (1989) The Impact of Macroeconomic Policies on the Rural Poor: Analytical Framework and Indicators, UNDP Policy Discussion Paper, United Nations.

Behrman J. and A. Deolalikar (1988) "Impact of Macro Economic Adjustment on the Poor and on Social Sectors in Jamaica," OED, World Bank.

Binswanger, H. (1989) "How Agricultural Producers Respond to Prices and Government Investments," World Bank.

Blejer, M. and I. Guerrero (1988) "The Impact of Macroeconomic Policies on Income Distribution: An Empirical Study," IMF, WP/88/57.

Bourguignon, F., W. Branson, and J. de Melo (1988) "Macroeconomic Adjustment and Income Distribution: A Macro-Micro Simulation Model," mimeo for "Adjustment and Equitable Growth" conference, OECD.

Bourguignon, F., W. Branson, and J. de Melo (1989) "Adjustment and Income Distribution: A Counterfactual Analysis" , PPR Working Paper 215, World Bank.

Bourguignon, F. and Morrisson (1989) External Trade and Income Distribution, Development Centre Studies, OECD.

Bourguignon, F. (1989) "Optimal Poverty Reduction, Adjustment and Growth," mimeo, World Bank.

Bourguignon, F., J. de Melo and A. Suwa (1989) "Distributional Effects of Adjustment Policies: Simulations for Two Archetype Economies" Background paper for 1990 WDR, World Bank.

Bourguignon, F, G. Michel and D. Miqueu (1983) "Short-Run Rigidities and Long-Run Adjustments in a Computable General Equilibrium Model of Income Distribution and Development" Journal of Development Economics 13.

Catsambas, T. (1988) "Distributional Implications of Government Tax and Expenditure Policies: Issues, Problems and Methodology," IMF WP/88/19.

Corden, M. (1986) Inflation, Exchange Rates, and the World Economy, University of Chicago Press, Chicago.

Decaluwe, B. and A. Martens (1988) "CGE Modeling and Developing Economies: A Concise Empirical Survey of 73 Applications to 26 Countries," Journal of Policy Modeling, 10/4.

de Janvry, A., A. Fargeix, and E. Sadoulet (1989) "Economic Welfare, and Political Consequences of Stabilization Pooicies: A General Equilibrium Approach," mimeo, UC-Berkeley.

de Janvry, A. and S. Subramanian (1985) "The Politics and Economics of Food and Nutrition Policies and Programs: An Interpretation" The Political Economy of Nutritional Improvements No. 349.

de Melo, J. and S. Robinson (1982) "Trade Adjustment Policies and Income Distribution in Three Archetype Developing Economies" Journal of Development Economics, Vol 10.

Demery, L. and T. Addison (1987) "Stabilization Policy and Income Distribution in Developing Countries" World Development, Vol 1., No. 12.

Demery, L. (1988) "Adjustment and Income Distribution: The Role of Labour Markets" Development Economics Research Centre University of Warwick.

Demery, L. (1987) "Adjustment and Income Distribution: Some Methodological Issues mimeo for conference on Analytical Methods for Estimating Short-Term Nutritional and Poverty Effects of Macroeconomic Adjustment Policies in Developing Countries.

Dervis, K., J. de Melo, and S. Robinson (1982) General Equilibrium Models for Development Policy, World Bank research publication.

Devarajan, J., J. Lewis, and S. Robinson (1986) "A Bibliography of Computable General Equilibrium (CGE) Models Applied to Developing Countries" Division of Agriculture and Natural Resources, U. of California, Paper No. 400.

Diaz, F. (1987) "Some Lessons from Mexico's Tax Reform," in Newberry and Stern, eds., The Theory of Taxation for Developing Countries.

Dornbusch, R. (1980) Open Economy Macroeconomics, Basic Books, New York.

Edwards, S. (1988) "Terms of Trade, Tariffs, and Labor Market Adjustment in Developing Countries" The World Bank Economic Review, Vol.2, No.2.

Ethier, W. (1984) "Higher Dimensional Issues in Trade Theory," in Handbook of International Economics, Vol. 1.

Glewwe, P. and D. de Tray (1988) "The Poor during Adjustment: A Case Study of Cote d'Ivoire," Living Standards Measurement Study 47, World Bank.

Glewwe, P., and D. de Tray (1989) "The Poor in Latin America during Adjustment: A Case Study of Peru," Living Standards Measurement Study 56, World Bank.

Helleiner, G. (1985) "Stabilization Policies and the Poor," mimeo, U. of Toronto.

IMF, (1988) "The Implications of Fund-Supported Adjustment Programs for Poverty: Experiences in Selected Countries," Occasional Paper No. 58, IMF.

IMF, (1986) "Fund-Supported Programs, Fiscal Policy, and Income Distribution,"

Occasional Paper No.46, IMF.

Kakwani, N. (1990) "Poverty and Economic Growth with Application to Cote D'Ivoire," Living Standards Measurement Survey No. 63, World Bank.

Kanbur, S.M. (1987a) "Measurement and Alleviation of Poverty," IMF Staff Papers.

Kanbur, S.M. (1987b) "Structural Adjustment, Macroeconomic Adjustment and Poverty: A Methodology for Analysis" World Development, Vol. 15. 12. pp. 15-1526

Kanbur, R. (1988) "The Implications of Adjustment Programs for Poverty: Conceptual Issues and Analytical Framework," mimeo, conference on The Implications of Adjustment Programs for Poverty Groups, IMF.

Kanbur, S.M.R. (1988) "Poverty and the Social Dimensions of Structural Adjustment in Cote D'Ivoire," SDA Unit, World Bank.

Kanbur, R. (1989) "Conceptual Notes for the Poverty WDR," mimeo, World Bank.

Khan, M. and M. Knight (1985) "Fund-Supported Adjustment Programs and Economic Growth," Occasional Paper No. 41, IMF.

Knight, J. (1976) "Devaluation and Income Distribution in Less-Developed Economies Oxford Economic Papers, 28/2.

Krueger, A. (1983) Trade and Employment in Developing Countries, vol. 3, Synthesis and Conclusions, University of Chicago Press.

Lal, D. (1983) "Real Wages and Exchange Rates in the Phillippines, 1956-78: An Application of the Stolper-Samuelson-Rybczynski Model of Trade," World Bank Working Paper 604, World Bank.

Lal, D. (1984) "The Real Effects of Stabilization and Structural Adjustment Policies: An Extension of the Australian Adjustment Model," World Bank Working Paper 636, World Bank.

Maasland, A. and I. Taylor (1988) "Manual for a Structuralist Macro Model Program," in L. Taylor, ed. Structuralist Computable General Equilibrium Models: Socially Relevant Policy Analysis for the Developing World, forthcoming.

Mussa, M. (1974) "Tariffs and the Distribution of Income: The Importance of Factor Specificity, Substitutability, and Intensity in the Short and Long Run," Journal of Political Economy 82/6.

N'cho-Oguie, C. (1989) "Integrating Social Dimensions in Macroeconomic Adjustment Policy Analysis: Toward a Modelling Strategy," SDA Unit, World Bank.

Neary, J (1985) "Theory and Policy of Adjustment in an Open Economy" Current Issues in International Trade.

Newman, J., S. Jorgensen, M. Pradhan (1990) "How Did Workers Benefit from Bolivia's Emergency Social Fund," mimeo, World Bank.

Quizon, J. and H. Binswanger (1986)."Modeling the Impact of Agricultural Growth and Government Policy on Income Distribution in India," World Bank Economic Review 1/1.

Ravallion, M. (1989) "Do Price Increases for Staple Foods Help or Hurt the Poor?", PPR Working Paper 167, World Bank.

Ravallion, M. and M. Huppi (1989) "Poverty and Undernutrition in Indonesia during the 1980s," PPR Working Paper 286, World Bank.

Ravallion, M. and D. van de Walle, (1989) "Poverty Orderings of Food Price Reforms," mimeo, World Bank.

Scobie, G. (1989) "Macroeconomic Adjustment and the Poor: Toward a Research Strategy," CFNPP Monograph 89-1, Cornell University.

Thorbecke, E. (1985) "Consistency-Type Planning Models," in Pyatt and Round, eds. Social Accounting Matrices: A Basis for Planning, World Bank.

Thorbecke, E. and D. Berrian (1987) "Impact of Structural Adjustment Policies on Poverty and Nutrition Analyzed Within A General Equilibrium Framework," mimeo, Cornell University.

World Bank (1987) Protecting the Poor During Periods of Adjustment, Development Committee Pamphlet No. 13.

World Bank (1990) "Malawi - Country Economic Memorandum - Growth Through Poverty Reduction."

World Bank (1990) "Macroeconomic Models of Adjustment - A Literature Review", mimeo, Economic Development Institute, World Bank.

World Bank (1990) "Poverty and Adjustment - A Literature Review", mimeo, Economic Development Institute, World Bank.

World Bank (1990) "Women and Adjustment - A Literature Review", mimeo, Economic Development Institute, World Bank.

World Bank (1990) Report on Adjustment Lending II, Country Economics Macro Adjustment and Growth Division, forthcoming.

Youngblood, C., C. Parillon, R. Franklin and D. Franklin (1989) "An Assessment of the Need for Directed Food Assistance to Support a Proposed Structural Adjustment Program in El Salvador," Sigma One Corporation, mimeo prepared for USAID #PDC-1406-I-00-7028-00.

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