The Effects of Structural Adjustment Programs on Poverty and Income Distribution

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Abstract

The focus of this work is to measure the effects of Structural Adjustment Programs (SAPs) of the International Monetary Fund (IMF) on poverty and income distribution. This study tries to estimate the impacts of SAPs on a variety of poverty indicators controlling for nonrandom selection. We make use of the matching method to test for differences in poverty indicators and GINI coefficients for countries participating in IMF agreements and countries which do not. Performing Heckman regressions we study the effects in more detail. We control for economic factors and include regional sub-models to test for robustness. Propensity score matching does not show significant effects of SAPs on poverty indicators. Using Heckman regressions we find evidence that participation in IMF programs is connected to higher poverty rates and a more unequal income distribution. These results stay robust after controlling for other economic variables.

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1 Introduction

At the end of World War II the international economic system was devastated. Certain rules and procedures were needed to recover economic stability and therefore the need of new institutions emerged. One of the institutions established in the course of the Bretton Woods Agreements in 1944 was the International Monetary Fund (IMF). It was assigned with regulating the international monetary system and financial system and promoting its stability. It should encourage economic cooperation and help to promote the health of the world economy. Additionally to its purpose to "promote economic stability, help prevent crises, and help resolve them when they do occur" it is also responsible for "promoting growth and alleviating poverty" (International Monetary Fund, 2008). Michel Camdessus, the Managing Director of the Fund from 1987 to 2000, also highlighted the importance of poverty alleviation in his speech in Geneva in July 1999 with his statement: "It is now high time to bring our full attention to bear on the challenge of poverty."

Despite of the dedication of the IMF to reduce poverty, harsh criticism emerged that IMF programs lead to an increase in poverty rates in recipient countries (e.g. Hertz, 2004; Cavanagh, Welch & Retallack, 2000; Lundberg and Squire, 2003; Abugre, 2000). Therefore, we try to find out in this paper if SAPs have a positive influence on poverty rates in participating countries or if IMF critics are right.

The link between IMF programs and poverty is a relatively new area of study. Some initial research has been conducted (e.g. Garuda, 2000, Easterly, 2001, Vreeland, 2002) but most of the literature is still theoretical. The number of empirical investigations is limited. This study tries to investigate the question of if Structural Adjustment Programs are the right means of fighting poverty.

2 Structural Adjustment

Structural Adjustment Programs are programs which make it possible for countries to get a loan from the IMF or the World Bank. These loans are connected with conditionalities like significant policy reforms which have to be complied with before getting the loan (Abugre, 2000). In history the main agency providing structural adjustment lending was the World Bank. Since 1986 also the International Monetary Fund was providing adjustment loans and later other international financial institutions (IFIs) adopted the principle.

Program Overview

In this study we address the principal IMF programs, namely Stand-By Arrangements, the Extended Fund Facility, the Structural Adjustment Facility, the Enhanced Structural Adjustment Facility and the more recent arrangements under the Poverty Reduction and Growth Facility which replaced the Enhanced Structural Adjustment Facility in 1999.

Stand-By Arrangements (SBA) are generally shorter term agreements which last typically one to two years and imply higher conditionality. They are designed to help countries with more severe disequilibria to address short-term balance of payment problems. The greatest amount of IMF resources was provided under SBAs.

The Extended Fund Facility (EFF) was established to help countries with severe disequilibria to address longer-term balance of payment problems which require fundamental economic reforms. The typical EFF program usually lasts three years.

The Structural Adjustment Facility (SAF) and the *Enhanced Structural Adjustment Facility (ESAF)* are generally longer term programs with lower conditionality. Programs under the SAF normally imply less stringent conditionality than ESAF programs and mostly antecede ESAF programs. ESAF programs sometimes have a longer duration than three years.

The Poverty Reduction and Growth Facility (PRGF) was created in September 1999. It replaced the Enhanced Structural Adjustment Facility. The PRGF is a low-interest lending facility for low-income countries. It is based on country-owned Poverty Reduction Strategy Papers which are prepared by the government of the country concerned. The largest number of IMF loans has been made through the PRGF in recent years (IMF External Relations Department, 2008 and Garuda, 2000).

Theoretical impacts of IMF programs on Poverty

Structural Adjustment Programs typically include a lot of different policies which interact with each other. It is most likely that the countries in which SAPs are implemented differ in terms of their economies and pre-program conditions from non-program countries but also from each other. Therefore, it is not easy to isolate the impacts of SAPs on poverty, which are in general complex and not clear-cut.

Policies and variables which might influence poverty and income distribution include currency devaluation, reductions in the budget deficit and changes in growth rates, inflation rates and interest rates. Some argue that economic growth of a country has a direct influence on poverty as gains achieved via growth would trickle down and benefit the poor leading to a reduction in poverty. Today however most agree that neither macroeconomic stability nor economic growth is enough for alleviating poverty (Gunter, Cohen, & Lofgren, 2005). Although higher growth rates are on average accompanied by greater progress in poverty alleviation – as certain financial means are needed to combat poverty which can only be achieved via growth – this does not prove that trickle down strategies are the best methods for fighting poverty. It is important to take distributional effects into account as well. Therefore, the right politico-economic programs are needed (Stiglitz, 2002).

It is obvious that not just one but a lot of factors have to be taken into account when it comes to analyze the effect of policy changes on poverty. Therefore, particular characteristics of the affected countries, as well as the details of the implemented reforms, have to be considered. The following section should give a general overview about theoretical expectations of these reforms on poverty.

A mayor goal of Structural Adjustment Programs is a ***reduction of inflation***. It is broadly agreed that high levels of inflation have negative consequences on growth and poverty. Some studies however find that countries which achieve and maintain macroeconomic stability might not necessarily gain significant pay-offs in growth and poverty reduction (Gunter, Cohen, & Lofgren, 2005). Lower inflation is likely to improve the real incomes of the poor if the adjustment of incomes to a rise in expenditures due to inflation is slow. The impact of lower inflation rates on income distribution depends on the rigidities of income to prices of each group of individuals. That means that if poorer individuals face longer adjustment lags than wealthier people, lower inflation will reduce inequality in income distribution (Garuda, 2000). Easterly and Fisher report that inflation increases poverty as the more wealthy have a better access to inflation-protected assets or other financial instruments that hedge in some way against inflation (Easterly & Fischer, 2000).

Adjustment lending is generally associated with ***currency devaluation***. In developing countries there are negative associations with currency devaluation however. This is because of fears of setting off a devaluation-inflation spiral, low exports and import elasticities, increased domestic costs of servicing foreign debt, increased costs of financing subsidies for imported inputs, fear of a loss of confidence on the part of

foreign investors and many other political reasons. Until now there is no clear cut conclusion about the relationship between devaluation and poverty (Gunter, Cohen, & Lofgren, 2005). In theory however, the effect of currency devaluation is a decrease in the price ratio of non-tradable to tradable goods. This might be good for alleviating poverty and improve income distribution within a country if the poor are rural farmers producing goods for export as their incomes are increased but it might worsen income distribution if the poor are urban consumers who are facing higher food prices or rural farmers producing for domestic consumption (Garuda, 2000). Devaluation might worsen income distribution as well if elite groups engage in capital flight prior to the devaluation (Pastor, 1987).

Fiscal Policy is an essential component of IMF programs, which aim to decrease the budget deficit. This can be achieved through higher levels of taxation and/or reductions of public expenditure. Of course the re-distributional effects of such a policy depend on the composition of the budget cuts of the government, but are also influenced by producer mobility and the adaptability of consumer patterns.

Real expenditure reduction is generally achieved through contraction in social expenditure, public sector contraction and privatization (Handa & King, 1997). A study conducted by Johnson and Salop (1980) states that a downward adjustment of government expenditure to GDP is very likely to be borne out by public sector employees engaged in capital-intensive projects which come to be postponed (Johnson & Salop, 1980 cited by Vreeland, 2002). Expenditure cuts in public sector employment – which lead to an at least temporary increase in unemployment – and lower wages and salaries of people working in the public sector, will tend to increase poverty and worsen income distribution, particularly when those reductions hit low-level government employees. How these policies affect prices of consumption goods is ambiguous. Changes in prices might affect real incomes of the poor in either direction, independent of their nominal incomes and therefore reduce or increase poverty (Garuda, 2000).

Access to domestic credit affects poverty and income distribution as well. Increased interest rates or bank reserve requirements as well as imposed credit ceilings will reduce access to domestic credit and will make it easier for large companies to get credits in contrast to small and medium-sized firms. Generally the urban sector is favored over the rural sector (Johnson & Salop, 1980 cited by Vreeland, 2002).

Budgetary cuts or higher levels of taxation, as well as reductions in real wages and

credit restraints, are very likely to reduce domestic demand. This leads to a decrease of overall spending. Heller (1988) states that such a contraction of spending “is almost certain to lower the well-being of both labor and the poorest members of an economy”. If demand restraint in countries which participate in Fund programs is higher than it would have been otherwise, it is most likely for poverty levels to rise. If the participation in IMF programs however tend to increase the overall growth, poverty rates would get lower due to job creation. To evaluate the effects of job growth, it is important to know the composition of growth and the sectors of the economy in which poverty is predominant. Therefore, agricultural growth may lead to reductions in poverty if rural poverty is widespread (Garuda, 2000). Gunter, Cohen and Lofgren (2005) state that in general poor people suffer more from policy changes and shocks than the wealthy and therefore need to be protected from the effects of contractionary fiscal policies.

IMF programs imply ***trade liberalization*** most of the times. Trade liberalization is likely to have two contrary effects on poverty. First, sectors which were protected before the liberalization will contract and lead to lower incomes in these areas. Apart from that however, trade liberalization might benefit labor-intensive sectors and finally result in higher wages or lower unemployment (Handa & King, 1997). Gunter, Cohen and Lofgren (2005) survey the recent empirical literature about the effects of trade liberalization on poverty. According to them, most of the studies show that trade liberalization has had – or could have had – a positive impact on poverty reduction but led to a higher inequality. They also mention that, depending on production, trade and consumption patterns, some poor people are positively and some negatively affected by trade liberalization. It depends on the type of agreement if trade liberalization benefits developing countries or not.

The effects of ***labor market reform*** are ambiguous as well. Restrictions tend improve the situation of the employed to the detriment of the unemployed (Handa & King, 1997).

Financial liberalization is a common tool used by the IMF to force changes in the domestic capital markets of developing countries. It can be shown that there is a strong connection between financial liberalization, weaknesses in the domestic banking sector and currency crisis. It is commonly agreed that financial liberalization needs to be accompanied by sound economic policies and legal and regulatory underpinnings to improve economic performance, because they would have strongly negative effects on some poor groups otherwise (Bird & Rajan, 2001).

Structural Adjustment Programs can be completed successfully in many different ways which imply different consequences on poverty and income distribution. ***Political power*** plays an important role in determining the way of achieving a program (Vreeland, 2002; Garuda, 2000 and Pastor, 1987). Therefore, it is most likely that IMF programs are implemented in such a way that hurts politically powerful groups least, frequently at the expense of the poor.

3 Empirical analysis

3.1 Approach

It is quite difficult to find an answer to the question if SAPs have positive or negative impacts on poverty levels, as we cannot observe the outcomes which would have occurred in the absence of SAPs in affected countries. Additionally the participating countries do not make their choice randomly on whether to join a program or not. Countries which are more likely to join an IMF agreement generally face different macroeconomic conditions (Przeworski & Vreeland, 2000). One has to take into account these differences in country conditions which could contribute to differences in poverty and/or income distribution between countries. That, and the fact that not all of the relevant factors contributing to these differences are observable (as political will for example), will produce biased estimates of the effect of SAPs on poverty and income distribution.

To avoid selection bias, we first perform propensity score matching. We also use the Heckman method to regress different poverty indicators on program participation only. Then, we control for other factors as well to test if there is a change in the results. We estimate region sub-models to test for robustness.

To tackle the problem of gaps in the data, we try to maximize the data points available by conducting a worldwide study. We make use of different poverty indicators like poverty gaps, poverty headcount ratios, decentile shares and GINI coefficients. We combine different databases to get the best out of the data available.

3.2 Descriptive Poverty Model

Before starting to control for nonrandom selection, we include descriptive statistics. We group the data according to the program participation status of the countries (*never*

under IMF agreement, *before* the first program participation, *during* program participation, *between* two IMF programs and *after* the last IMF program as long as program participation is observed). Then, we calculate the means, medians, standard deviations and the number of observations for each of the categories (see Appendix C.1) It turns out that poverty rates are higher for countries *during* and especially *between* participation in IMF programs. Those poverty rates are not only higher in comparison to poverty rates of countries which *never* participated in an IMF agreement but also higher than poverty rates observed *before* the first participation in a SAP. *After* the last participation observed in the time horizon of the dataset, poverty rates turn out to get lower again, even lower than they had been before the first participation. The same pattern emerges when it comes to income distribution. GINI coefficients are the lowest for countries never participating in IMF programs and for countries before their first participation. The highest values for GINI coefficients are scored in countries which are located between two program participations, followed by countries currently participating in programs. After completion of their last observed IMF agreement, GINI coefficients decrease again but still remain on a higher level than *before* the first program participation. It should be mentioned that the standard deviation is quite large for all groups.

To see if there is a significant difference between poverty rates of countries under IMF agreement and countries not participating in SAPs we perform mean comparison tests (two-sample t-tests) with unequal variances. It turns out that there is no systematic difference of *pgap_1, phcr_1* and *gini_1* between participation observations and non participation observations. The differences between the means of *pgap_2, phcr_2, gini* and *gini_rep* by program participation status turn out to be significant, indicating that countries which are currently under IMF agreement face systematically higher values for those variables.

Note that this is just a descriptive supervision of the data. To eliminate the bias in the data other econometric methods have to be used.

3.3 Program Participation Model

For performing matching or using the Heckman model it is necessary to estimate a selection model which accounts for the macroeconomic differences in countries. The selection model is used to predict the probability of a country joining an IMF agreement (propensity score). Table 1 shows the specification of the selection model we will use in

the following. It predicts 73.15% participation in IMF programs correctly respectively (Logit specification, cut at 0.35) as shown in Table 2.

COEFFICIENT	**prog**
lgdp_pc	-0.000229***
	(0.0000264)
num	0.0112***
	(0.00291)
years	0.161***
	(0.00920)
lexch	0.00000343**
	(0.00000135)
linvest	-0.0187***
	(0.00627)
Constant	-1.444***
	(0.163)
Observations	2827
R-squared	.

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1: Determinants of participation in IMF programs

	Program	**Not-Program**
Predicted Program	815	500
Predicted Not-Program	259	1253
Total	1074	1753

Correctly Predicted	
Program	75.88 %
Not-Program	71.48 %
Total	73.15 %

Table 2: Fit of predicted participation in IMF programs

3.4 Matching

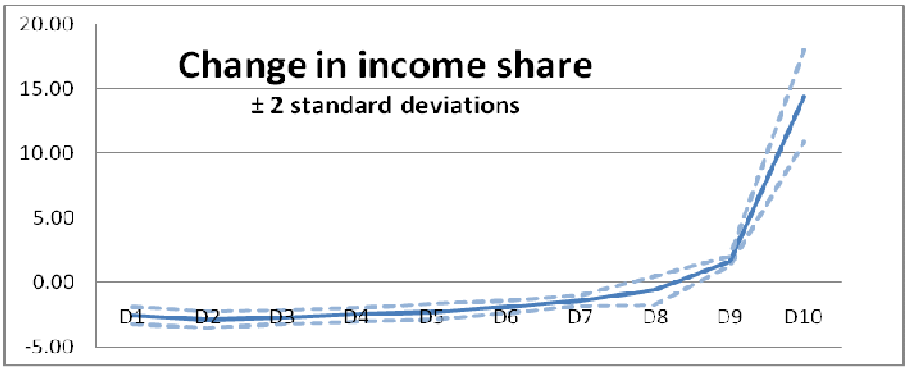
The matching method allows controlling for differences in economic preconditions of countries and therefore eliminating the bias. It is done by grouping program and non program observations according to their propensity score. This method makes sure that only poverty rates of countries with similar economic preconditions (with similar propensity scores) are compared.

Performing matching for all of the variables measuring poverty in this study, most of the coefficients are insignificant. Exceptions are *phcr_urban* where program participation seems to have a negative effect on the urban poverty headcount ratio and all of the *GINI* coefficients used in this study, where program participation seems to have a positive effect on income equality. It is important to note however that *gini* and *gini_rep* are heteroskedastic and therefore the results of matching for these variables should not be interpreted.

3.5 Heckman model

Performing regressions of different poverty measuring variables and GINI indicators on IMF-program participation, the coefficient of program participation turns out to be positive and highly significant (at the one percent level) for each of the poverty indicators. The result appears to be similar (positive and highly significant) for all of the GINI coefficients except for gini_1, where program participation turns out to be positive and significant only at the ten percent level. This indicates that – controlling for selection bias - countries which are participating in one of the IMF adjustment programs mentioned above, face higher poverty rates, higher poverty headcount ratios, or higher income inequality respectively, than if they would not have participated.

To get information about which income groups are affected negatively by IMF program participation, we perform Heckman regressions of income decentiles on program participation. According to the results, the first seven income decentiles (the 70% of the population in lower income levels) are likely to lose some of their income share. For decentile 8, the coefficient of program participation turns out not to be significant and the two upper decentiles (the richest 20% of the population) seem to benefit when participating in Structural Adjustment Programs. Graph 1 summarizes these outcomes graphically.



Graph 1: Changes in income shares of income decentiles

To test whether the results achieved stay robust to a change in the selection model, we include different specifications of the model in the Heckman regressions, leading to similar results.

3.5.1 Controlling for other variables

3.5.1.1 Specification I

Poverty indicators

To see if the effect of participation in SAPs on poverty stays the same, we control for other variables in the second stage of the Heckman model. Therefore we include *gdp_pc* and *gini_1* as explanatory variables (see Easterly 1999) as well as *infl* and *nct* (for a detailed explanation of the variables see Appendix B).

In regressions of the variables *pgap_1, pgap_2* and *phcr_1* all of the coefficients turn out to be significant. The coefficients *gdp_pcg* and *gini_1* have the expected sign. The coefficient of *nct* has a negative sign. Endogenity might be the reason, as higher poverty rates might be connected with a bigger amount of transfers. Surprisingly, *infl* turns out to have a negative sign, indicating that there are lower poverty rates if inflation is high. This adverse result might be obtained as a consequence of countries with hyperinflation, which might be included in the dataset. For controlling for hyperinflation we estimated the regressions again including only countries with inflation rates lower than 30 percent with the result that the coefficient became positive but insignificant. It is striking that the program coefficient remains positive and highly significant even in this specification of the models, controlling for other variables.

It was not possible to perform regressions of *phcr_2* and *phcr_rural*. In regressions of *phcr_national* and *phcr_urban* the coefficient of *prog* remained positive and significant at the one percent level. Most of the explanatory variables turned out to be insignificant however. This might be the case because of a small number of observations available for these specifications.

Controlling for primary education (unlagged) it turns out that the program coefficient stays positive and significant at the one percent level for regressions of all of the four poverty indicators (*pagp_1, pgap_2, phcr_1* and *phcr_2*). The coefficient of primary education is negative like expected – as one would assume that primary education contributes positively to lower poverty rates – and highly significant in all of the regressions.

Lutz, Crespo Cuaresma and Sanderson (2008) show in their work that a high level of secondary education is needed to alleviate poverty. Therefore, we control as well for secondary education. Doing so, the results stay the same. Secondary education has a negative sign like expected, as poverty is likely to be lower in countries in which secondary education is higher. The coefficient is highly significant in all of the

regressions. Program participation remains significant and positive in regressions of *pgap_2, phcr_1* and *phcr_2*. It is not significant any more for *pgap_1*.

Including lags of primary and secondary education respectively, it is not possible to obtain results for regressions on all of the poverty indicators due to data limitations. In a regression of *pgap_2,* the two year lag of secondary education is highly significant and negative. The program coefficient remains positive and stays significant including *nct* as well, but becomes insignificant leaving out *nct* as an explanatory variable. In a regression of *phcr_2* the two year lag of secondary education is highly significant and negative as well. Program participation remains positive and highly significant.

Income equality

In a regression of *gini_1* on *gdp_pcg, infl nct* and *prog* only *gdp_pcg* turns out to be significant, all of the other regressors are not. In this specification it is not possible to achieve a clear result on how SAPs influence income distribution.

In regressions of *gini* and *gini_rep* on the same variables, all of the regressors turn out to be highly significant and have the expected sign (except of *infl* which changes its negative sign controlling for hyperinflation. The coefficient of *nct* is very small but positive, which indicates that transfers are likely to benefit the rich). Program participation is significant at the one percent level in both regressions. It has a positive sign, indicating that program participation is likely to lead to a more unequal income distribution.

Including primary education (unlagged) in the regressions, leads to unexpected results. In a regression of *gini_1,* the coefficient of program participation is positive but insignificant. Primary education is highly significant but positive what one would not expect. It is not possible to include lags of primary education. In a regression of *gini,* program participation stays positive and significant at the five percent level. Primary education turns out to be insignificant in this specification. Including secondary education (unlagged) results in an insignificant coefficient for program participation for regressions of *gini_1* and *gini*. In a regression of *gini_rep,* program participation stays positive and highly significant.

We also perform regressions of income decentiles on the variables *gdp_pcg, infl* and *nct*. We do not include a GINI indicator because it is by definition highly correlated with

the income decentiles. Like before, program participation has a negative and highly significant influence on the first 7 income decentiles. The effect of program participation on decentile 8 is ambiguous. Decentiles 9 and 10 benefit from program participation. The coefficient of the program dummy for these decentiles is positive and highly significant.

Including primary education (unlagged) it is not possible to perform a regression of income decentile 2. In regressions of decentile one and decentiles three to seven, program participation stays significant and negative. For decentile 8, the effect of program participation is not significant, but it again becomes significant and positive for decentiles nine and ten. Including secondary education in the regressions leads to similar results. The coefficient of program participation is highly significant and negative for the first six income decentiles. Secondary education is positive and highly significant for the first eight decentiles. For the decentiles nine and ten program participation is highly significant and positive as one would expect. Secondary education turns negative but stays highly significant.

3.5.1.2 Specification II

Poverty indicators

For another specification of the Heckman model we use *gdp_pcg, gini_1, infl*, *gdsavings* and *lf_part* additionally to the program variable as explanatory variables. We do not include *nct* because it turns out to be not significant in regressions on most of the poverty indicators. In regressions of these variables on the four mayor poverty indicators, all of the variables turn out to be significant. Surprisingly *lf_part* has a positive sign. This might be an endogenity problem as in countries with higher poverty rates, also women are forced to go to work and gain money which rises labor force participation. In every regression the coefficient of *prog* is positive and highly significant, indicating a negative influence of program participation on poverty rates.

Including primary education (unlagged) in regressions, the results stay the same. Program participation remains positive and highly significant in the regressions of *pgap_1, pgap_2* and *phcr_1.* The coefficient of primary education is highly significant and negative like expected in regressions of these indicators. It is not possible to obtain standard errors in a regression of *phcr_2*. Including secondary education (unlagged) does not change the results. Secondary education is significant and negative for all of the specifications. The program coefficient stays positive and highly significant at the

one percent level, except in a regression of *pgap_1,* where it turns out not to be significant.

Income equality

In regressions of GINI coefficients on *gdp_pcg, infl, nct, gdsavings lf_part* and *prog*, *gdsavings* and *lf_part* turn out to be insignificant in each of the regressions. In a regression of *gini*_1, only *gdp_pcg* turns out to be highly significant, program participation is positive and significant at the ten percent level. In regressions of *gini* and *gini_rep*, *gdp_pcg, infl* and *nct* stay highly significant, as well as program participation which is positive and significant at the one percent level.

Including primary education (unlagged) in the regression of *gini_1* results in an insignificant program participation coefficient. In regressions of *gini* and *gini_rep*, program participation stays positive and highly significant. In these regressions, primary educations turns out not to be significant. If we include secondary education in the regressions, program participation stays highly significant and positive in regressions of *gini* and *gini_rep*. It becomes insignificant however for a regression of *gini_1*.

3.5.2 Have things changed with the PRGF?

To test if the progression from the ESAF to the Poverty Reduction and Growth Facility (PRGF) in September 1999 had significant effects on poverty and inequality indicators we run several Heckman regressions. Therefore we include a dummy coded 1 for the years 2000 to 2005 as a regressor in the poverty model and the same variable multiplied with *prog* to examine the effects of the period for only program countries.

Poverty indicators

We regress the four mayor poverty indicators of this study *(pgap_1, pgap_2, phcr_1 and phcr_2)* on the period dummy (*from2000*), the program participation dummy (*prog*) and the product of these dummies (*progfrom2000*). The outcome shows that the period dummy is significant at the five percent level in all of the regressions. The negative sign indicates that poverty has been sinking from the beginning of 2000 in non participation countries. The coefficient of the *progfrom2000* is not significant in any of the

regressions. It cannot be said that there has been any poverty lowering effect of SAPs since the introduction of the PRGF. The coefficient of the program dummy stays positive and highly significant in all of the four regressions.

To check if the results remain robust we add *gdp_pcg, gini_1* and *infl* as further regressors in the equations. It turns out that all of the additional regressors are significant at least at the five percent level with the expected sign (*infl* with a negative sign like before). *Progfrom2000* remains insignificant in all of the equations. The period dummy *from2000* loses significance, becoming insignificant in the regression of *phcr_2* and staying significant but just at the ten percent level in regressions of the other three poverty indicators. The coefficient of the program dummy remains positive and highly significant in all of the regressions. The introduction of the PRGF does not seem to show statistically significant poverty lowering effects for countries under IMF agreement. Including *nct* in the regressions leads to the same results except of that *progfrom2000* does not have any significant influence on poverty reduction any more.

Income equality

We run the same regressions as well for GINI coefficients. Including only the period dummy, the program dummy and the product of the two as regressors, leads to the result that *progfrom2000* is insignificant in all of the regressions. It cannot be said that the period since the transition to the PRGF had any clear effect on income distribution for countries participating in SAPs. *From2000* is negative and significant at the ten percent level in the regression of gini_1 and even at the one percent level for the other two GINI coefficients. The program coefficient stays positive and significant (at the five percent level for *gini_1* and at the one percent level for the other two dependent variables).

Heckman regressions controlling as well for *gdp_pcg, infl* and *nct* additionally to the dummies used above, lead to the same outcome. The effects of SAPs on income distribution stay the same.

It would be interesting to estimate regressions only on programs under the PRGF and see if anything has changed concerning the impacts of those programs on poverty. Due to data limitations however, it is not possible to perform such regressions.

3.6 Region Subsamples

To test if the results hold over region subsamples and if there are differences in the effects of SAP on poverty in different regions, we group the countries into seven regions. Then, we perform Heckman regressions of the poverty indicators used in this study on program participation, for each of the country groups. As there is only a small number of observations for some groups, it is not possible to achieve results for all of the regressions.

Region 1: East Asia & Pacific

Because of the small number of data points for this region it is not possible to obtain results for regressions of most of the poverty indicators and GINI coefficients. It is only possible to achieve a result for the regression of *pgap_1* on program participation. The coefficient of *prog* is insignificant however.

Region 2: Europe & Central Asia

As there are more data points available for this region, the regressions performed lead to more informative results. In all of the regressions of the four poverty indicators, program participation turns out to have a positive and significant coefficient (significance level: 10% for *pgap_1*, 1% for *pgap_2*, 5% for *phcr_1* and 1% for *phcr_2*). In regressions of all of the three GINI coefficients, program participation turns out to have a positive and highly significant coefficient.

Region 3: Latin America & Caribbean

The regressions for this region turn out to result in unexpected outcomes. Regressions of all of the four poverty indicators lead to a negative and highly significant coefficient of program participation. According to that result, Structural Adjustment Programs seem to have poverty lowering effects in this region.

Regressions of the GINI coefficients on program participation lead to inconsistent results. In the regression of *gini_1*, the program coefficient is negative and highly significant. In the regressions of *gini* and *gini_rep* however, the coefficient of program participation turns out to be positive and highly significant as well. It is interesting, that using GINI coefficients of different databases, the results change. It is not possible to

find out, if the change in the results is due to diverging observations, or to differences in GINI coefficient for the same observations. The comparability and quality of GINI coefficients is discussed in detail in the literature.

Region 4: Middle East & North Africa

For the region Middle East & North Africa it is only possible to achieve results in regressions of *pgap_1* and *pchr_1*. The program participation coefficient is positive but turns out to be insignificant however.

Region 5: North America and Region 6: South Asia

Because of the small number of observations for the regions North America and South Asia it is not possible to perform regressions on either of the poverty indicators or GINI coefficients.

Region 7: Sub-Saharan Africa

For Sub-Saharan Africa, the regression of the four poverty indicators on program participation show that participation in SAPs seems to lead to a worsening of poverty levels. The coefficient of program participation is positive and highly significant in regressions of *pgap_2*, *phcr_1* and *phcr_2* and positive but significant at the ten percent level only in the regression of *pgap_1*. Concerning GINI coefficients it is just possible to obtain results for the regression of *gini_1*. Here, the coefficient of the program dummy is negative and significant at the five percent level. The results indicate that program participation seems to lead to a more equal income distribution but to higher poverty levels in the region Sub-Saharan Africa.

4 Avoiding Bias

The analysis of the data in Chapter 3 specifies every year in which a country was under IMF agreement as program year and every year it was not under an agreement as not-program year. This means, that also years between two IMF agreements of a country, were classified as non-program years, as well as the years after a countries last program participation. It is very probable however, that those years reflect program effects, due to consequences of the programs implemented before. Therefore, we

conduct an analysis on the effects of IMF SAPs on poverty, using only program years and years which did not show any effect of program participation. We group the data into program year and non-program year observations. Countries which were currently under IMF agreement in a given year are located in the program group. As the counterfactual, we use only observations of countries which never participated in an IMF program and years before the first participation of a country in a program. Doing so, we lose some of the program observations, but make sure to avoid bias in the data, due to non observable program effects after the implementation of a program in a participation year.

4.1 Mean comparisons by program participation

To see if there is a difference between means of poverty indicators according to the participation status of a country in IMF programs, we perform two-sample t-tests with unequal variances for the new participation definition of above. It is interesting that using this specification, one can reject the null hypotheses that 1) there is no difference in the means and that 2) the mean of non-program observations is higher than the one for program observation for each of the indicators used (*pgap_1, pgap_2, phcr_1, phcr_2, gini_1, gini* and *gini_rep).* For all of these variables (except of *gini_1*) one can reject the hypotheses at the one percent level (for *gini_1* one can reject the null hypotheses on the five percent level). The result that the differences in means of the variables *pgap_1, phcr_1* and *gini_1* - which have been insignificant before - turn out to be significant in this specification of program participation, might be obtained due to a clearer isolation of program vs. non program observations. Countries which have never been under IMF agreement in the past face in general lower poverty rates and GINI coefficients.

4.2 Program Participation Model

With the new program participation classification, the program participation model from before changes and with it also all further models, due to the change in propensity scores. Table 3 shows the new program participation model (Probit-specification with robust standard errors).

	(4)
COEF	**prog_new**
lgdp_pc	-0.000156***
	(0.0000362)
num	0.0430***
	(0.00385)
years	0.373***
	(0.0200)
linvest	-0.0361***
	(0.00654)
ldebt_serv	0.0508***
	(0.0118)
lext_debt	0
	(0)
Constant	-2.812***
	(0.234)
Observations	1794
R-squared	.

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Determinants of Participation in IMF programs

All of the coefficients of the new program participation model have the expected sign. Every regressor, except for *lext_debt*, is highly significant. Although *lext_debt* is not significant even at the ten percent level, this model specification achieves the best fit of program prediction to program participation. It predicts 88.35% of participation decisions correctly. The best fit of the participation probabilities to program participation was achieved with a cut at a probability level of 0.4. Table 4 gives a short overview about the power of the model to predict IMF participation correctly. Compared to the former selection model, the new selection model is better in predicting the participation in IMF programs.

	Program	Not-Program	Correctly Predicted	
Predicted Program	982	117	**Program**	91.43%
Predicted Not-Program	92	603	**Not-Program**	83.75%
Total	1074	720	**Total**	88.35%

Table 4: Fit of predicted participation in IMF programs

4.3 Poverty Model

4.3.1 Matching

To see if there is a difference in poverty rates for countries under IMF agreement vs. the control group (consisting of observations of countries never participating in an IMF agreement and observations of countries before their first participation in a program), we perform propensity score matching for the indicators of interest. This time, we use the new specification of program participation and the new propensity score obtained with this specification.

It is not possible to perform matching for *phcr_rural, phcr_urban, gini* and *gini_rep.* Due to heteroskedasticity of the other variables it is only possible to obtain a useable result for *gini_1.* It turns out that program participation is likely to improve income distribution in comparison to countries not under IMF agreement also when using the new propensity scores.

4.3.2 Heckman model

In the following Heckman models we use the program dummy with only *never*, *before* and *during* observations and the new selection model.

In regressions of the four mayor poverty indicators on only program participation (*never, before* and *during* observations) all of the program coefficients turn out to be positive and significant at the one percent level. Also in this new model, IMF program participation seems to be connected with higher poverty rates compared to non-program participation. Compared to the poverty model from before however, the coefficients turn out to be lower in the new model. This result might be an indicator that *between* and *after* observations (which have been classified as non-program years before and left out in the new selection model) contribute to better results in poverty rates of non-program observations. This can be affirmed at least for *after* observations looking at the descriptive statistics of the data (see Appendix C.1).

Concerning GINI coefficients it is only possible to perform a regression of *gini_1* on program participation. The program coefficient is negative but insignificant. Due to data limitations it is not possible perform regressions of the other GINI coefficients or the income decentiles on program participation.

Including dummies to control for the period after the introduction of the PRGF, both in participation (*progfrom2000*) and non-participation countries (*from2000*) does not

change the effects of program participation on the four mayor poverty indicators. The coefficient remains positive and highly significant in all of the regressions. The coefficient of *from2000* is positive and significant for regressions of *pgap_2* and *phcr_1*. The dummy controlling for the 2000 to 2005 period in countries under IMF agreement (*progfrom2000*) turns out to be significant for regressions of *pgap_1, pgap_2* and *phcr_1*. The sign is negative, indicating that since the introduction of the PRGF, the negative impact of SAPs on poverty has fallen in program countries. Note however the very high correlation in the variables *from2000* and *progfrom2000,* which is 0.83 in this specification.

Controlling for other factors, the results change slightly. Although the coefficient of program participation stays positive and highly significant for regressions of all of the four indicators, the *from2000* dummy is insignificant in each of the regressions. The *progfrom2000* dummy becomes insignificant for regressions *of pgap_1* and *phcr_2*. In regressions of *pgap_2* and *phcr_1* it is significant only at the ten percent level, but remains negative. The question, if the introduction of the PRGF influenced the poverty rates of countries participating in an IMF program in a positive way compared to the period before 2000, becomes less clear.

A regression of GINI coefficients is only possible for *gini_1* like before. In such a regression *from2000* has a highly significant positive sign; *progfrom2000* is highly significant as well with a negative sign. The coefficient of program participation becomes insignificant however. This might indicate that program participation in the period after 2000 is likely to improve income equality for countries participating in IMF programs, in comparison to former years. The results stay the same controlling for other factors (*gdp_pcg, infl* and *nct*).

5 Summary of the results

Summarizing, one can say that Structural Adjustment Programs of the IMF seem to have negative impacts on poverty and income distribution.

Matching turns out not to achieve significant results in most cases, just the urban poverty headcount ratio seems to be significantly higher in participation countries than in non participation countries and income distribution (measured by *gini_1*) seems to be significantly better in program participation countries.

More significant results were able to be achieved with the Heckman method where

program participation seems to lead to higher poverty levels in participation countries. Also income distribution seems to be worse in program countries than in non participating countries. The results stay robust controlling for other variables as well as in different specifications of the model.

Program participation seems to affect poverty headcount ratios more than absolute poverty rates. Poverty headcount ratios rise much more in countries participating in IMF programs than do poverty gap indicators. Furthermore, indicators for poverty, defined as people living with less than two dollars per day, worsen more than indicators based on the one dollar per day poverty line in countries under IMF agreement. This result holds for both absolute poverty levels and poverty headcount ratios.

Concerning income distribution, the pattern that emerges is quite the same. Program participation turns out to have a positive and significant coefficient resulting in a more unequal income distribution in participation countries, also controlling for other variables. The coefficient becomes insignificant only in a limited number of cases. Controlling for the period after the introduction of the PRGF, the program coefficients in all of the regressions on GINI coefficients turn out to be positive and significant.

Surprisingly, the coefficients of program participation differ a lot from each other, according to the GINI indicator used as independent variable. Using *gini_1* - which is obtained from the “World Development Indicators” database - leads to a systematically lower program participation coefficient than using *gini* and *gini_rep* - which are obtained from the “World Income Inequality Database”. The difference remains controlling for differences in the observations included in the regression. This result reflects the problematic in obtaining reliable data for measuring inequality of income distribution. GINI coefficients might not be comparable to each other, as it is to be assumed that there are differences in the calculations of the coefficients. The region subsamples used in this study point out the problematic of GINI coefficients more clearly.

6 Outlook

This paper gives evidence that IMF programs tend to harm countries in terms of poverty levels and income distribution. Rich people seem to profit from the participation in IMF programs, poor people seem to lose, falling even deeper into poverty. One of the arguments of the IMF is that, although there might be a negative impact on poverty levels in the short run, the situation tends to improve in the long run. It does not

disclose however, how long IMF programs need to show positive outcomes. Furthermore, it is not easy to tell if good results concerning poverty reduction in the long run are based on IMF programs, as there has been a large time horizon between the program implemented and the result achieved. Due to data limitations and a big amount of factors that determine poverty reduction, it is quite hard to estimate the impact of IMF programs on poverty indicators in the long run. This would be an interesting question for further research. With more data points available for poverty levels, it would also be suggestive to estimate region subsamples again. Doing so, it might be possible to find out how IMF programs affect poverty indicators in different regions of the world.

The introduction of the PRGF in November 1999 was an important step in the history of the International Monetary Fund. It would be interesting to find out if the transition from ESAF to PRGF led to better strategies to reduce poverty and if there is any statistically significant change in its impact on poverty levels. That is why this part is included as well in this study. As the results achieved change according to the specification of program participation (all observations available vs. never, before and during observations), it would be interesting to conduct a more detailed study about this topic in the future, when there are more data points available for after-PRGF-introduction. Probably this would lead to more revealing results.

It would be an interesting question for further research, how corruption affects income distribution. Theory suggests that corruption has significantly negative impacts on income distribution and therefore on poverty reduction. It would be interesting to include corruption as an additional regressor, when estimating the effects of IMF programs on poverty indicators. One could find out if the negative impacts of IMF agreements on poverty remain or if they are due to higher corruption rates in countries under IMF agreement.

Controlling for education seems to be reasonable in further studies as well. It was only possible to a limited degree in this study. It would make more sense to include lagged values of education variables. The problem is that this would leave the sample with only a small number of observations. More data points available could overcome that problem.

Of course, it is not straightforward which factors determine poverty. There is a variety of factors that lead to changes in poverty levels and income distribution. Those factors are likely to influence each other as well. It is not possible to design a model that controls

for all of the poverty determining factors and all of their cross connections. One could confront this problem designing sub-models which estimate the effects of IMF programs on social indicators. This is reasonable as theory suggests that social indicators (like education, social safety nets, health indicators etc.) influence poverty levels as well. Creating such sub-models might help to split up the complicated relationships between different factors on poverty indicators and to achieve more enlightening and more detailed results.

As one can see, this work is just the beginning of an interesting field of study. Much is left for further research. This kind of study might serve as a control mechanism for institutions like the IMF. It could be used to show if the policies implemented achieve the desired results, or if they are not the right mean to reach a goal. Maybe, this could give international institutions the incentive to think about changes in policies, which might lead to better results and not to rely on well tried means to reach a goal, which might have controversial outcomes. Of course it is hard to determine policies which are most suited to achieve a goal as complex as poverty reduction, as there are a lot of factors which cross-influence each other. Studies like this one should be seen as a thought-provoking impulse for international institutions to worry whether the means used to reach a goal are the right ones to achieve the desired outcome.

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Appendix A. Countries included in the study

A.1. Summary of countries included in the study

Afghanistan	Albania	Algeria
American Samoa	Andorra	Angola
Antigua and Barbuda	Argentina	Armenia
Aruba	Australia	Austria
Azerbaijan	Bahamas, The	Bahrain
Bangladesh	Barbados	Belarus
Belgium	Belize	Benin
Bermuda	Bhutan	Bolivia
Bosnia and Herzegovina	Botswana	Brazil
Brunei Darussalam	Bulgaria	Burkina Faso
Burundi	Cambodia	Cameroon
Canada	Cape Verde	Cayman Islands
Central African Republic	Chad	Channel Islands
Chile	China	Colombia
Comoros	Congo, Dem. Rep.	Congo, Rep.
Costa Rica	Cote d'Ivoire	Croatia
Cuba	Cyprus	Czech Republic
Denmark	Djibouti	Dominica
Dominican Republic	Ecuador	Egypt, Arab Rep.
El Salvador	Equatorial Guinea	Eritrea
Estonia	Ethiopia	Faeroe Islands
Fiji	Finland	France
French Polynesia	Gabon	Gambia, The
Georgia	Germany	Ghana
Greece	Greenland	Grenada
Guam	Guatemala	Guinea
Guinea-Bissau	Guyana	Haiti
Honduras	Hong Kong, China	Hungary
Iceland	India	Indonesia
Iran, Islamic Rep.	Iraq	Ireland
Isle of Man	Israel	Italy
Jamaica	Japan	Jordan
Kazakhstan	Kenya	Kiribati
Korea, Dem. Rep.	Korea, Rep.	Kuwait
Kyrgyz Republic	Lao PDR	Latvia
Lebanon	Lesotho	Liberia
Libya	Liechtenstein	Lithuania
Luxembourg	Macao, China	Macedonia, FYR
Madagascar	Malawi	Malaysia
Maldives	Mali	Malta
Marshall Islands	Mauritania	Mauritius
Mayotte	Mexico	Micronesia, Fed. Sts.
Moldova	Monaco	Mongolia
Morocco	Mozambique	Myanmar
Namibia	Nepal	Netherlands

Netherlands Antilles
Nicaragua
Northern Mariana Islands
Pakistan
Papua New Guinea
Philippines
Puerto Rico
Russian Federation
San Marino
Senegal
Sierra Leone
Slovenia
South Africa
St. Kitts and Nevis
Sudan
Sweden
Tajikistan
Timor-Leste
Trinidad and Tobago
Turkmenistan
United Arab Emirates
Uruguay
Venezuela, RB
West Bank and Gaza
Zimbabwe
New Caledonia
Niger
Norway
Palau
Paraguay
Poland
Qatar
Rwanda
Sao Tome and Principe
Serbia and Montenegro
Singapore
Solomon Islands
Spain
St. Lucia
Suriname
Switzerland
Tanzania
Togo
Tunisia
Uganda
United Kingdom
Uzbekistan
Vietnam
Yemen, Rep.
New Zealand
Nigeria
Oman
Panama
Peru
Portugal
Romania
Samoa
Saudi Arabia
Seychelles
Slovak Republic
Somalia
Sri Lanka
St. Vincent and the Grenadines
Swaziland
Syrian Arab Republic
Thailand
Tonga
Turkey
Ukraine
United States
Vanuatu
Virgin Islands (U.S.)
Zambia

A.2. Countries under IMF agreement at least once from 1980 to 2005

Afghanistan
American Samoa
Azerbaijan
Belarus
Bolivia
Bulgaria
Cambodia
Central African Republic
China
Congo, Dem. Rep.
Cote d'Ivoire
Djibouti
Ecuador
Equatorial Guinea
Gabon
Ghana
Guinea
Haiti
India
Albania
Argentina
Bangladesh
Belize
Bosnia and Herzegovina
Burkina Faso
Cameroon
Chad
Colombia
Congo, Rep.
Croatia
Dominica
Egypt, Arab Rep.
Estonia
Gambia, The
Grenada
Guinea-Bissau
Honduras
Indonesia
Algeria
Armenia
Barbados
Benin
Brazil
Burundi
Cape Verde
Chile
Comoros
Costa Rica
Czech Republic
Dominican Republic
El Salvador
Ethiopia
Georgia
Guatemala
Guyana
Hungary
Iraq

Jamaica	Jordan	Kazakhstan
Kenya	Korea, Rep.	Kyrgyz Republic
Lao PDR	Latvia	Lesotho
Liberia	Lithuania	Macedonia, FYR
Madagascar	Malawi	Mali
Mauritania	Mauritius	Mexico
Moldova	Mongolia	Morocco
Mozambique	Nepal	Nicaragua
Niger	Nigeria	Pakistan
Panama	Papua New Guinea	Paraguay
Peru	Philippines	Poland
Portugal	Romania	Russian Federation
Rwanda	Sao Tome and Principe	Senegal
Serbia and Montenegro	Sierra Leone	Slovak Republic
Solomon Islands	Somalia	Sri Lanka
Sudan	Tajikistan	Tanzania
Thailand	Togo	Trinidad and Tobago
Tunisia	Turkey	Uganda
Ukraine	Uruguay	Uzbekistan
Venezuela, RB	Vietnam	Yemen, Rep.
Zambia	Zimbabwe	

Appendix B. Variables used in this study

B.1. Program participation model

prog:

Dummy variable coded 1 for current participation in an IMF program (SBA, EFF, SAF, ESAF, PRGF) and 0 for countries never participating in an IMF program, countries before their first participation, countries between two IMF programs and countries after their last program participation (source: matched data – we adopted the data from EVRENSEL who coded the dummy equal to 1 for participation of at least one day of a year in a program for programs from 1971 to 1981; for programs from 1982 to 2006 we took the data from the IMF homepage (IMF Members' Financial Data by Country; http://www.imf.org/external/np/fin/tad/exfin1.aspx) and coded the dummy equal to 1 for participation in an IMF program of at least 4 months of a year. We did so, as any program implemented needs some time to show effects. The break in the data does not affect the variable *prog* used here, as we consider only years from 1982 on. It just affects the variable *years* indirectly as this variable used in the 1st model sums up the program-dummies in the entire history of the country)

prog_new:

Dummy variable coded 1 for current participation in an IMF program (SBA, EFF, SAF, ESAF, PRGF) and coded 0 for countries never participating in an IMF program and countries before their first participation in an IMF program (same sources as for prog)

lgdp_pc:

Lagged GDP per capita (source: World Development Indicators 2007 - World Bank (CD))

num:

Number of other countries participating in an IMF program (source: created by summing up prog over all countries in a given year minus *prog* of the country itself)

years:

Cumulative number a years that a country has been under IMF agreement (source: created by summing up *prog* over a countries past. Note: there is a break in the data as mentioned in the explanation of *prog*)

sys_pres:

Dummy variable coded 1 if the systems consist of unelected executives or with presidents who are elected directly or by an electoral college or systems without prime minister (source: Database of Political Institutions; http://go.worldbank.org/2EAGGLRZ40)

finittrm:

Dummy variable coded 1 if there is a constitutional limit on the number of years the chief executive can serve before new elections must be called (source: Database of Political Institutions; http://go.worldbank.org/2EAGGLRZ40)

lexch:

Lagged official exchange rate (LCU per US$, period average) (source: World Development Indicators 2007 - World Bank (CD))

linvest:

Lagged investment share of RGDPL (% in 2000 Constant Prices) (source: Penn World Tables; http://pwt.econ.upenn.edu/php_site/pwt_index.php; http://pwt.econ.upenn.edu/php_site/pwt62/pwt62_form.php; PWT 6.2 (188 countries, 1950-2004, 2000 as base year)

ldebt_serv:

Lagged total debt service (% of GNI) (source: World Development Indicators 2007 - World Bank (CD))

lreserves:
Lagged total reserves (includes gold, current US$) (source: World Development Indicators 2007 - World Bank (CD))

lbop_gdp:
Lagged current account balance (% of GDP) (source: World Development Indicators 2007 - World Bank (CD))

linfl:
Lagged inflation, GDP deflator (annual %) (source: World Development Indicators 2007 - World Bank (CD))

lfdi:
Lagged foreign direct investment, net inflows (% of GDP) (source: World Development Indicators 2007 - World Bank (CD))

lexp_growth:
Lagged exports of goods and services (annual % growth) (source: World Development Indicators 2007 - World Bank (CD))

limp_growth:
Lagged imports of goods and services (annual % growth) (source: World Development Indicators 2007 - World Bank (CD))

lext_debt:
Lagged external debt, total (DOD, current US$) (source: World Development Indicators 2007 - World Bank (CD))

lgni_pc:
Lagged GNI per capita, PPP (current international $) (source: World Development Indicators 2007 - World Bank (CD))

B.2. Poverty model

Poverty Indicators:

pgap_1:
Poverty gap at $1 a day (PPP) (%) (source: World Development Indicators 2007 – World Bank (CD))

pgap_2:
Poverty gap at $2 a day (PPP) (%) (source: World Development Indicators 2007 –

World Bank (CD))

phcr_1:

Poverty headcount ratio at $1 a day (PPP) (% of population) (source: World Development Indicators 2007 – World Bank (CD))

phcr_2:

Poverty headcount ratio at $2 a day (PPP) (% of population) (source: World Development Indicators 2007 – World Bank (CD))

phcr_national:

Poverty headcount ratio at national poverty line (% of population) (source: World Development Indicators 2007 – World Bank (CD))

phcr_urban:

Poverty headcount ratio at urban poverty line (% of urban population) (source: World Development Indicators 2007 – World Bank (CD))

phcr_rural:

Poverty headcount ratio at rural poverty line (% of rural population) (source: World Development Indicators 2007 – World Bank (CD))

gini_1:

GINI index (source: World Development Indicators 2007 – World Bank (CD))

gini:

GINI index (source: World Income Inequality Database, WIID2C, http://www.wider.unu.edu/research/Database/en_GB/wiid/)

gini_rep:

Reported GINI index (source: World Income Inequality Database, WIID2C, http://www.wider.unu.edu/research/Database/en_GB/wiid/)

d1 – d10:

Income decentiles (income definition: income, disposable)
(source: World Income Inequality Database, WIID2C, http://www.wider.unu.edu/research/Database/en_GB/wiid/)

Explanatory Variables:

gdp_pcg:

GDP per capita growth (annual %) (source: World Development Indicators 2007 – World Bank (CD))

infl:

Inflation, GDP deflator (annual %) (source: World Development Indicators 2007 – World Bank (CD))

nct:

Net current transfers (BoP, current US$) (source: World Development Indicators 2007 – World Bank (CD))

gdsavings:

Gross domestic savings (% of GDP) (source: World Development Indicators 2007 – World Bank (CD))

lf_part:

Labor force participation rate, total (% of total population ages 15-64) (source: World Development Indicators 2007 – World Bank (CD))

prim:

School enrollment, primary (% gross) (source: World Development Indicators 2007 – World Bank (CD))

sec:

School enrollment, secondary (% gross) (source: World Development Indicators 2007 – World Bank (CD))

from2000:

Dummy variable coded 1 for each year from 2000 to 2005 (source: created by myself)

progfrom2000:

The *from2000* dummy multiplied with the *prog* dummy (source: created by myself)

Appendix C. Data appendix

C.1. Descriptive Statistics

Pgap_1	mean	median	sd	N
never	2.496909	0.5	4.12384	22
before	3.32629	0.7	5.226506	62
during	5.733099	2.005	8.047922	202
between	10.7621	4.328	13.05848	50
after	2.869608	0.5	6.231259	51

Pgap_2	mean	median	sd	N
never	8.516364	3.485	10.00497	22
before	10.24339	5.245	12.49448	62
during	16.4997	10.76	15.34943	202
between	24.47396	14.91	20.44056	50
after	7.716333	3.14	11.72425	51

Phcr_1	mean	median	sd	N
never	8.17895	2	10.78997	22
before	11.41145	3.33	14.81099	64
during	16.03797	7.51	17.57128	203
between	25.71103	13.615	24.34444	50
after	8.90598	2	13.35774	56

Phcr_2	mean	median	sd	N
never	22.2945	13.945	19.51912	22
before	26.38778	17.905	27.41192	64
during	38.38691	31.59	27.24014	203
between	48.70265	42.59	31.11538	50
after	22.71526	13.33	22.88446	56

GINI	mean	median	sd	N
never	28.74936	28.7	5.203118	265
before	29.04167	26.7	11.72965	36
during	41.04612	36.8	11.14374	116
between	46.96471	50.85	11.70061	34
after	36.21323	34.7	10.82365	65

GINI_1	mean	median	sd	N
never	39.89917	36.17203	11.51351	49
before	38.56968	36.06	13.68796	63
during	42.03577	41.485	9.450691	206
between	46.07442	46.17	9.790434	52
after	41.97398	41.844	9.456745	54

GINI_rep	mean	median	sd	N
never	28.80389	28.58	5.194115	265
before	29.22944	27.31	11.76392	36
during	41.05552	37.55	10.79339	116
between	46.62765	49.79	11.32216	34
after	36.44985	35.3	10.5924	65

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