



IEO Background Paper



Social Spending in IMF-Supported Programs

Ricardo Martin and Alex Segura-Ubiergo

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Independent Evaluation Office

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Prepared by Ricardo Martin and Alex Segura-Ubiergo

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Abstract

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This paper analyzes social spending in IMF-supported programs using a data base on public health and education spending for 146 countries over the 1985–2000 period. It uses Autoregressive Integrated Moving Average (ARIMA) model techniques as well as a two-stage estimation method to obtain parameter estimates and correct for the endogeneity of Fund programs. Contrary to common perception, our findings show that social spending does not decline under IMF-supported programs. However, this does not necessarily mean that the most vulnerable groups are protected from the effects of economic adjustment.

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I. INTRODUCTION

Critics of the Fund have argued that IMF policy recommendations with their emphasis on fiscal adjustment—through a combination of tax increases and seemingly drastic reductions in public expenditures—have had a devastating effect on the poor. For example, Naiman and Watkins (1999) of the Center for Economic and Policy Research have argued that “there is an urgent need for increased attention to the provision of basic social services. However, IMF adjustment programs restrict access to health services and public education in two key ways: by reducing household incomes, and by reducing public (government) spending”. Similarly, the Bretton Woods Project (2004), a well-known critic of Washington-based international financial institutions notes that “in the face of public exhortations to greater spending on social services, low income country governments however find themselves trapped by Fund diktat on budget balances, inflation and interest rates.” Other NGO’s such as Global Exchange (2001) have pointed out that “the subordination of social needs to the concerns of financial markets has made it more difficult for national governments to ensure that their people receive food, health care, and education.”

Although there are many statements about the negative impact of the IMF on social spending, there is very limited empirical evidence systematically assessing this question. This paper uses time-series cross-section data to investigate the impact of IMF-supported programs on public sector social spending and shed new light on this issue. Social expenditures are measured with annual data of government spending on health and education compiled by the Fiscal Affairs Department (FAD) of the IMF¹ and verified and checked for accuracy by staff of country desks. The dataset covers 146 countries during the period 1985-2000. The basic statistical framework underlying the analysis relates social spending in a particular country and year to the presence of an IMF program that year and to a set of (control) variables that may also influence the levels of social spending.² In order to achieve results as robust as possible, we used four different indicators for education and

¹ See Baqir (2002) for a description and coverage.

² That is, we will start by estimating an equation of the form:

$$[1] S_{it} = X_{it}\alpha + \beta * IMF_{it} + \varepsilon_{it}$$

where S_{it} measures social spending in country i in period t ; IMF_{it} is one or more variables indicating the presence of a Fund arrangement in period t ; X_{it} is the set of control variables (e.g. all other factors determining S); and ε_{it} is an error term. The problems of this model (serial correlation and unit roots, endogeneity of Fund programs, etc.) and the possible mechanisms to deal with them are discussed below.

health expenditures (Table 1): as share of GDP, as share of total government expenditures, as an index of real expenditures at domestic prices,³ and in as expressed U.S. dollars per capita.⁴

Our analysis proceeds in three steps. First, we describe the general characteristics of the dataset and compare the mean values of each indicator for periods *with* and *without* a Fund program. We then proceed to compare periods *with* and *without* a Fund program in the same country. This is useful as a reference point for the rest of the analysis, although it has severe limitations as a measure of the actual impact of IMF-supported programs on social spending.

Second, we discuss ways of addressing these limitations and obtaining a better measure of the impact of IMF-supported programs on social spending. Third, we explore the sensitivity of the results to the selection of countries in the sample and to the econometric specification of the model. We conclude with a summary of the main lessons and findings, and also discuss the limitations of our approach and identify possible areas for further research.

II. DETERMINANTS OF SOCIAL EXPENDITURES AND THE IMPACT OF IMF-SUPPORTED PROGRAMS

An evolving focus

In its first fifty years of operation, the IMF paid limited attention to social spending and social issues such as poverty and the distribution of income. The IMF's role was to promote international monetary cooperation, the balanced growth of international trade, and to ensure a stable system of exchange rates. Although these fundamental institutional objectives are still in place, in the late 1980s and 1990s social policy issues increasingly acquired more importance in the activities of the IMF.⁵

³ In the absence of a sector-specific price index, social expenditures were deflated by the general consumer price index. expenditures in U.S. dollars were calculated at the annual average exchange rate, and deflated by the U.S. wholesale price index.

⁴ It is not clear a priori that one indicator is better than others. Social expenditures as a percentage of GDP measure the overall macroeconomic importance of social expenditures using the size of the economy as a comparative benchmark. Social expenditures as a share of government spending provide a measure of fiscal priorities within the budget, and is thus a more direct indicator of the degree to which policy-makers wish to commit resources to the social sector. Finally, social expenditures per capita provide a better measure of the amount of direct or indirect resources that citizens receive from the state.

⁵ For example, a pamphlet on the IMF and the poor (IMF, 1998) notes that "in earlier periods the IMF's policy advice emphasized the management of aggregate demand with the aim of creating conditions for macroeconomic stability. In recent years, the focus and the scope of the IMF's work have broadened, and the structural and social aspects of fiscal policy have

(continued...)

Some recent empirical research by IMF staff suggests that average social spending in IMF-supported programs over the last two decades has increased. For example Gupta *et al.* (2000) show that for 65 of the 107 countries with IMF-supported programs during 1985–97, government spending on education and health care increased, on average, both as a percentage of GDP and in real per capita terms.⁶

Over the last two decades there has been a large body of research focusing on the impact of IMF-supported programs.⁷ Despite this large research output, we know of no studies that have tried to isolate the *impact* of the IMF on social expenditures.⁸ Though the neglect is understandable in retrospect, since social expenditures per se have not been at the core of the IMF's areas of responsibility, their increased importance in both the IMF's surveillance operations as well as program design now calls for greater attention. In the case of PRGF-supported programs, poverty and social sectors issues have become central elements. Hence, we believe that, in providing the first systematic attempt to obtain rigorous and robust estimates of the impact of IMF-supported programs on social expenditures, this study provides a useful contribution in an area characterized by much controversy but limited empirical analysis.

become increasingly important, both in programs that the IMF supports in members undertaking reforms (IMF-supported programs) and in its general policy advice.”

⁶ The authors document how the share in GDP of spending increased by 0.3 percentage points during the program period (about eight years on average), while in per capita terms social spending increased by 2.4 percent a year.

⁷ This has included work on the impact of Fund programs on *growth*: Bagci and Perraudin (1997), Barro and Lee (2002), Conway (1994), Dicks-Mireaux, Mecagni and Schadler (2000), and Przeworski and Vreeland (2000); on *fiscal adjustment*: Bulir and Moon (2003); on *income distribution*: Garuda (2000); on *private capital flows*: Rodrik (1996), Bird and Rowlands (1997), and Ergin (1999). There has also been considerable work on other key macroeconomic issues such as inflation and the current account.

⁸ Our work builds on previous research by Gupta, Clements, and Tiongson (1998) from the IMF's Fiscal Affairs Department, who show that since the mid-1980s real per capita spending on education and health has increased on average, with comparable increases for countries that had IMF-supported adjustment programs. Their research provides useful insights into the evolution of social spending in IMF-supported programs, but their conclusions are based on a comparison of averages. Our methodology is seeking to go beyond their work by including statistical controls and dealing with the endogeneity of IMF-Supported programs.

Box 1. Issues in the Analysis of the Impact of IMF-Supported Programs.

Goldstein and Montiel (1985) identified four desirable characteristics that any methodology trying to measure the impact of IMF-supported programs should have: (1) It should use information for a country “before-and-after” a IMF-Supported program and “with-and without” programs; (2) It should incorporate other domestic and international factors determining outcomes (control variables); (3) It should consider the determinants of domestic policies (policy reaction functions), to evaluate what outcomes would have been observed in the absence of a program; and (4) It should account for selectivity bias (endogeneity of Fund programs).^{1/} The approach used in this paper meets only three of the criteria, since we do not discuss explicitly a policy counterfactual. However, such a counterfactual is less important for the type of “outcomes” considered here—social expenditures—than for the broad macroeconomic indicators (e.g. growth, inflation, current account) considered by Goldstein and Montiel and others. There is also a dilemma of including domestic policy variables^{2/} among the controls: if they *are not* included, all their effect would be attributed to the IMF variable. Thus if countries without an IMF-supported program have better policies, on average, than those with programs, the estimated effect of the IMF variable would include the negative effect of bad policies. However, IMF programs affect domestic policies via conditionality and the general policy dialogue between the Fund and country authorities. Hence domestic policies are not exogenous to the presence of a Fund program and using them as controls runs the risk of ignoring a large part of their potential impact. One way of dealing with this is to use a policy reaction function as it provides a way of estimating how policies would differ with and without a IMF-Supported program.^{3/} Our paper does not explicitly include domestic policy variables, as an initial analysis of the determinants of social expenditures found no significant association with potential candidates (e.g. different measures of monetary and exchange rate policies). This omission implies that our analysis does not identify the channels through which IMF-supported programs affect social expenditures. In practice, we are simply estimating the “total effect” of IMF arrangements, including any potential effect via changes in other policies which in turn affect social spending. An estimation of the channels (indirect effects) through which IMF-supported programs may affect social spending was beyond the scope of this paper.

^{1/} The paper was mostly concerned with methodological issues, but it also included an empirical exercise comparing different ways of measuring the impact of IMF-supported programs. Mohsin Khan (1990) dubbed their approach the “generalized evaluation estimator” (GEE). The name seems to have stuck, although not always referring to a methodology with the four characteristics discussed above. For example, Khan emphasizes Goldstein’s and Montiel’s use of a policy reaction function. By contrast, Barro and Lee (2002) (who did not use this method) focus on the issue of sample selection bias as a defining characteristic of GEE. It is interesting to note that the empirical application in Goldstein and Montiel did not deal with the endogeneity issue—they just made some assumptions thought to be sufficient to eliminate the possibility of any sample selection bias.

^{2/} E.g. monetary and exchange rate policies.

^{3/} A different, and perhaps more difficult, question is what is the best way to estimate the policy reaction function. The method use by Goldstein and Montiel—estimating it with data for non-program countries—provides some interesting insights but, as the authors themselves recognize, is far from perfect.

Social spending and IMF-supported programs during 1985–2000

There is considerable variation in the amount of resources that developing countries devote to public expenditures on health and education. Table 1 summarizes public spending levels on health and education measured in four possible ways: per capita (in U.S. dollars and in local currency units at constant prices), as a share of total public expenditures, and as a percentage of GDP. Figure 1 compares averages in these indicators for two groups: country/years when there is an IMF program (“with IMF”) and the rest (“without IMF”).^{9,10} The averages for the two groups are very close—the “with IMF” group being slightly lower when social spending is measured as share of GDP, and slightly higher when measured as a share of total government expenditures.

Table 1. Social Expenditure Variables (Indicators) Used in the Study

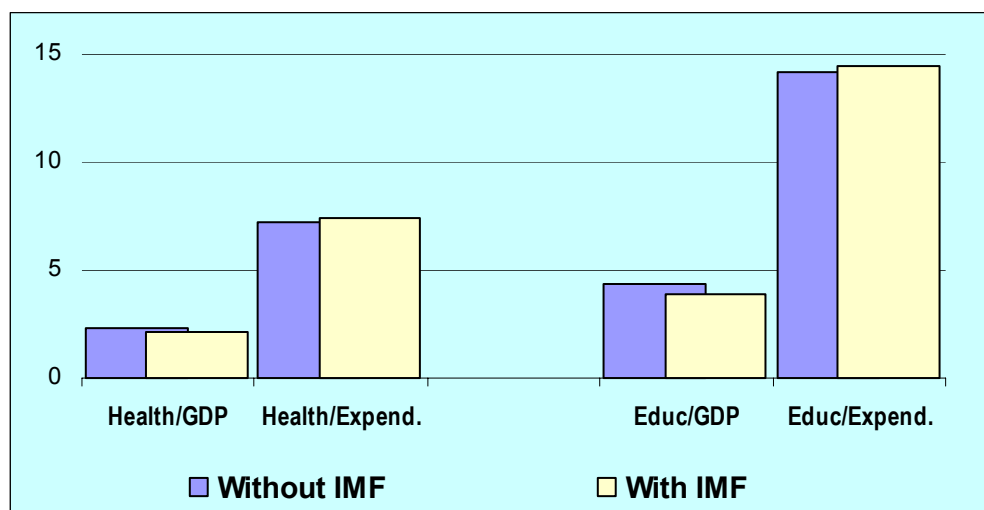
Description	Observations	Mean	Standard deviation
Health expenditure variables			
1. Share of GDP	1452	2.22	1.51
2. Share of total expenditures	1462	7.25	3.82
3. Per capita, at real domestic prices (index, country average, 1985-2000=100)	1418	100	29.86
4. Per capita, in U.S. dollars	1424	6.06	9.43
Education expenditure variables			
5. Share of GDP	1452	4.17	1.98
6. Share of total expenditures	1465	14.27	5.22
7. Per capita, at real domestic prices (index, country average, 1985-2000=100)	1413	100	25.28
8. Per capita, in U.S. dollars	1419	10.20	14.84

Source: IMF, Fiscal Affairs Department.

⁹ Years with only part of a program are allocated to each group in proportion to the length of the period under each of the two conditions. E.g, if country X embarked on an IMF program in September 1, 1990, social spending in 1990 is included in the *with* and *without* groups with weights $\frac{1}{4}$ and $\frac{3}{4}$, respectively. Similarly, in the regression analysis, the IMF variable is defined as the share of the year under a Fund program.

¹⁰ To make all indicators fit in the same scale, the figure shows the index at constant domestic prices divided by 100; i.e. the average for the 1985–2000 is set to 1.0, instead of 100 as in Table 1 and subsequent regressions.

Figure 1. Average Social Spending “With” and “Without” the IMF (1985–2000)
(In percent)



Source: IMF, Fiscal Affairs Department

This comparison of averages (Figure 1) provides an initial description of levels of social spending with and without IMF-supported programs; however, this information is hardly conclusive. For example, it cannot establish whether the differences depicted in the figure are (statistically) “significant.” Do the different levels of spending reflect fundamental differences associated with the presence of a IMF-Supported program? Or are they just random fluctuations for the particular sample of countries and periods representing each group? In other words, to the extent that other factors that may also affect spending are not controlled for, the observed differences could be spuriously associated with the IMF-Supported program.¹¹ What is needed, therefore, is a more explicit statistical analysis, including controls for those variables which may influence social spending and that are simultaneously associated with the presence of an IMF arrangement. Before embarking on this analysis, we present some results from comparing periods with and without Fund program for each particular country, where the need for control variables is somewhat less pressing.¹²

¹¹ For example, IMF-supported programs are more prevalent in lower income countries (the average income per capita in the “with IMF” group is US\$934, about one-third that of the “without IMF” group, US\$2,722 which also spend less on health and education in U.S. dollars per capita, so it is not surprising that average social spending in U.S. dollars is smaller in the “with IMF” group.

¹² Ideally, it would have been better to start by running individual country regressions (in a fully specified model with all the theoretically relevant variables) for each country in the sample. Unfortunately, the data set covers a limited time period (T=15). Hence, there is a
(continued...)

Table 2 summarizes the results for the 92–94 countries for which there is enough data to compare periods with and without a IMF-Supported program. In the majority of cases there is no statistically significant difference between both periods.¹³ Among the cases where there is a significant difference, the measures in shares of GDP or of total public expenditures show a majority of countries with higher education and health spending when there is a IMF-Supported program, but a majority with lower spending in terms of U.S. dollars per capita. At constant domestic prices, more countries show higher health expenditures and lower education expenditures with an IMF program.

Table 2. Summary of Country Regression Results by Significance of Measures of Social Spending

	Percent of GDP	Percent of total Exp.	U.S. dollar per capita	In domestic prices per capita	Average All measures
Health expenditure variables					
Countries with (statistically significant) higher spending when there is a Fund Program.	8	13	3	10	8.5
Number of countries with no significant difference between years with and without Fund programs	78	76	83	75	78
Countries with (statistically significant) lower spending when there is a Fund Program.	7	4	6	7	6
Education expenditure variables					
Countries with (statistically significant) higher spending when there is a Fund Program.	7	11	1	8	6.75
Number of countries with no significant difference between years with and without Fund programs	83	76	86	71	79
Countries with (statistically significant) lower spending when there is a Fund Program.	5	8	6	14	8.25

Table 2 thus indicates that in most countries (about 85 percent) there is no preponderance of evidence to show that social spending levels are systematically higher or lower during periods with IMF-Supported programs. And even in the cases where the results are significant, the evidence would be stronger if it were possible to control for other factors which might correlate with periods under an IMF arrangement. As discussed in the next

very small number of degrees of freedom for running individual country regressions, which would make it very difficult to obtain robust results. The alternative of running the regressions without controls is, to be sure, also problematic. Yet, it is sufficient for our initial purpose of providing some simple initial results on the basis of intra-country comparisons.

¹³ At at least a 90 percent confidence level.

section, this cannot be done properly with the limited number of observations available within each country.

One possible solution to the limitations of the country by country analysis is to combine time series (observations of one unit of analysis at different points in time) with cross section data (observations of a number of units of analysis at the same point in time).¹⁴ This would help us draw some empirical conclusions about what is likely to happen to social spending for an “average” country with a IMF-Supported program.

III. THE IMPACT OF IMF-SUPPORTED PROGRAMS ON SOCIAL SPENDING: A TIME-SERIES CROSS-SECTION ANALYSIS

Initial issues

To estimate the impact of the presence of an IMF-supported program on social spending, we need to address three potential sources of bias:

(a) *Missing variables*. It is necessary to include variables that have an independent effect on spending and that may also be associated with the presence of an IMF-supported program. Failure to do so would attribute to the presence of a Fund program, effects that are really the product of these other variables.¹⁵ The following control variables were defined using data from the World Bank’s *World Development Indicators* and the IMF’s *World Economic Outlook* (see Table A1 in the Appendix for the summary statistics, including means for the “with IMF” and “without IMF” groups).¹⁶

¹⁴ This method of aggregating data has two important advantages. First, it produces a relatively large N. Hence, it overcomes the “degrees of freedom” problem that typically affects individual country regressions. This allows the analyst to test for the effect of a large number of independent variables. Second, it pays attention to both longitudinal and cross-sectional variations, and can therefore produce useful generalizations across both time and space. However, the method also relies on rather stringent assumptions (e.g. parameter heterogeneity) and can potentially suffer the combined pitfalls of cross-sectional analysis (e.g. heteroskedasticity) and time-series analysis (e.g. nonstationarity, serial correlation, etc.)

¹⁵ “Omitted variables” bias is one of the most serious problems in econometrics. Unlike other problems such as heteroskedasticity, multicollinearity or serial correlation (without a lagged endogenous variable), omitting relevant variables leads to biased and inconsistent parameter estimates.

¹⁶ Two of the control variables (health_priv and ca_y) had insignificant coefficients and were excluded from the final regressions.

gdpusdpc	= GDP per capita in U.S. dollars
health_priv	= private expenditures in health as share of GDP (percent)
pop95young	= share of the population aged 0–14 (percent)
pop95old	= share of the population 65 years or older (percent)
growth	= annual rate of real growth (percent)
grw_neg	= annual rate of growth, when it is negative (=0 otherwise)
grw_sd	= variability (standard deviation) on the rate of growth
ca_y	= current account deficit, share of GDP (percent)
devaluation	= annual change on the real exchange rate (percent)
democracy	= index of democracy from the Polity IV dataset ¹⁷

The above control variables are important in accounting for the differences in social spending levels among countries. We discuss briefly the expected impact of some of these variables. First, we follow most empirical studies of the welfare state by including a measure of economic development to control for Wagner’s Law, according to which industrialization and modernization lead to an expansion of public activity over private activity. This occurs because in an increasingly complex society, the need for expenditures on regulatory activities grows. In addition, the demand for collective or quasi-collective goods—in particular education and culture—tends to be income elastic (i.e. its demand increases as income grows). As a result, as countries become wealthier, the state has to increase its supply of these goods, which would otherwise be undersupplied by the market.¹⁸ Second, our model also includes three measures of changes in output levels (i.e. the annual rate of real GDP growth, a dummy for years of negative GDP growth, and a measure of output volatility) that are likely to affect the amount of resources that countries can devote to social spending. Finally, we also include a variable that measures “democracy” using a numerical scale. The scale measures the degree to which elections are free and fair and basic civil rights and liberties are respected by the state. Democracy is expected to have a positive impact on social expenditures for two reasons: (a) in a democratic regime political leaders are more dependent on the popular vote and, to the extent that social expenditures can be used to gain the support of important electoral constituencies, politicians are more likely to increase the resources they allocate to the social sector; and (b) democratic regimes tend to have better developed civil societies that can more effectively press the state for social protection.

¹⁷ The index is defined from Gurr’s AUTOC and DEMOC scores: democracy=1 when DEMOC–AUTOC > 4, following Brown and Hunter (1999). See also Kaufman and Segura-Ubiergo (2001).

¹⁸ Another possible analytic framework to study the relationship between economic development and the size of the public sector is Baumol’s cost disease (See for example Baumol, 1993). According to Baumol, real wages in the private and public sectors grow at roughly the same rate. However, because the public sector is labor-intensive and mainly service-oriented, productivity in this sector in fact grows at a lower rate than in the private sector. Hence, the relative size of government in the economy grows.

These control variables can help explain some of the differences in spending between countries, but there may be residual country differences in spending not captured by them. To account for this possibility, the empirical model was also estimated with *fixed effects*, which allow for a different level of average spending for each country.¹⁹

(ii) *Serial correlation and nonstationarity*. Spending on social services tends to change sluggishly and be heavily affected by the level of spending during previous periods. This reflects not only the fact that most programs are often conceived as permanent or at least spanning several years, but also the political economy of budget allocation in which most programs have constituencies who resist change. For these reasons, changes in control variables (and IMF-supported programs) are likely to have an impact which is not instantaneous and may extend beyond one period. Thus, the empirical analysis should include a richer dynamics that distinguishes between short and medium term effects on social expenditures.

The empirical analysis addressed this issue by including the following:

- The value of social spending in the previous year (lagged y , or **LY**), to account for the dependence of current spending on past allocations.
- The value of all control variables in the previous period (**LX**), as well as the change (difference) between current and previous period values (**DX**). This permits each control variable to have either just a transitory effect on the current period (variable **DX**), or an extended effect over several periods.
- Similar specification for the presence of a Fund program (lagged and difference: **LIMF** and **DIMF**), which allows for a richer dynamic on the impact of these programs.

The above variables were then combined in an Autoregressive Moving Average process (ARIMA) which was sufficient to obtain independent and identically distributed residuals (IID). The structural equation of the ARIMA process is given by

$$[2] \quad S_{it} = \gamma LS_{i,t} + LX_{it} \alpha_0 + DX_{it} \alpha_1 + \beta_0 LIMF_{it} + \beta_1 DIMF_{it} + u_{it}$$

where **L** is the lag operator (i.e., $LZ_t \equiv Z_{t-1}$, for any variable Z), **D** is the first-difference operator ($DZ_t \equiv Z_t - Z_{t-1}$), and u_{it} are the new independent and identically distributed residuals (IID), which are not affected by serial correlation. In order to disentangle short and medium-term effects, it is useful for analytical purposes to rewrite equation 2 as

$$[2a] \quad DS_{it} = DX_{it} \alpha_1 + \beta_1 DIMF_{it} + (1 - \gamma)(LX_{it} \alpha_2 + LIMF_{it} \beta_2 - LS_{it}) + u_{it}$$

¹⁹ The model was thus estimated using a dummy variables for each country.

where $(1 - \gamma)\alpha_2 = \alpha_1$ and $(1 - \gamma)\beta_2 = \beta_1$. In this specification, changes in the dependent variables, DS_{it} , can be seen as the result of two effects: contemporaneous changes in the explanatory variables (with an impact determined by the coefficients α_1 and β_1); and gradual adjustment to an “equilibrium” level of spending, determined by the coefficients α_2 and β_2). Transitory changes in the independent variables do not change the long run “equilibrium” level, so that the effect decays geometrically at the rate $(1 - \gamma)$ after the second period

(iii) *Endogeneity of Fund programs.* Countries only engage the Fund and agree to its monitoring when they have an urgent need to access the resources that it provides. Thus, years with a IMF-supported program are not “normal” years. The special factors leading to the presence of a program could also, in principle, have an independent impact on social expenditures. For example, a country could seek a Fund program as result of an external crisis (e.g. a large increase in the price of imports or a fall in export prices), and such a crisis is likely to require a reduction in government expenditures with or without the Fund.²⁰

To address this issue, the following instruments were used to “predict” the presence of a program:

- Current account deficit as fraction of GDP in the previous year (as proxy of external crisis).
- Growth in the previous year (proxy of unsustainable expansion?).
- Income per capita (IMF-supported programs less likely on high income countries).
- Presence of a Fund program in the previous year.
- Government balance as share of GDP in the previous year.
- Democracy index (as in the control variables).

²⁰ In the absence of any rigorous way of defining counterfactuals (i.e. deciding what would have been the level of government social expenditures under a given set of conditions *with* and *without* a Fund program), the standard way to improve the estimation of the coefficients of endogenous variables is to estimate these variable together with the original equation. As the main interest is in the spending equations, though, we do not need a full estimation of the likelihood of an IMF program: it is enough to estimate the regression using instrumental variables. It is also not critical to include all the determinants of the IMF variable, provided that the set of instrumental variables at least includes all the factors which potentially affect both, the presence of a program and the level of social spending, since these are the factors that biased the estimate of the IMF variable.

IV. RESULTS

Table 3 presents regression results for the eight definitions of social spending, four for education and four for health. All eight indicators of health and education expenditures show positive coefficients for the contemporaneous and lagged values of the IMF variable; only three of the 16 coefficients are not significantly different from zero at least at a 90 percent confidence level (i.e. *, **, *** represent the 90, 95, and 99 percent confidence intervals), and 5 are significant at 99 percent level. It is interesting that this seems to reflect a specific effort to protect these types of expenditures, as **total** public expenditures are not significantly different with a without the IMF (see Table A3 in Appendix).

Table 3. ARIMA Model with Control Variables and Endogenous Fund Programs

	Health				Education			
	GDP	Total Exp.	U.S. dollar pc	DP pc	GDP	Total Exp.	U.S. dollar pc	DP pc
	(In percent)							
L Depend. Var.	0.577 ***	0.548 ***	0.748 ***	0.688 ***	0.604 ***	0.559 ***	0.662 ***	0.743 ***
L.IMF(predicted)	0.179 ***	0.492 *	0.390 *	4.593	0.251 **	0.681 *	0.168	4.157
D.IMF(predicted)	0.206 ***	0.636 **	0.395 **	9.736 ***	0.228 ***	0.748 **	0.333	6.027 **
L.gdpusdpc	-0.030 *	-0.027	0.014	-0.164	0.021	0.070	0.517	1.406
D.gdpusdpc	-0.080 ***	-0.093	1.101 ***	-2.761 **	-0.034	0.125	2.144 ***	0.178
L.devaluation	0.002 **	0.012 ***	0.010 ***	0.109 ***	-0.001	0.001	0.011 ***	0.007
D.devaluation	0.001	0.008 ***	0.005 ***	0.046 *	-0.001	0.000	0.005 **	-0.025
L.year	0.011 ***	0.068 ***	-0.002	1.219 ***	0.012 *	0.104 ***	-0.012	0.686 ***
L.democracy	0.061	0.342	0.221 *	2.917	0.142	0.620 *	0.114	4.969
D.democracy	0.009	0.308	0.072	1.784	0.035	0.428	0.056	2.852
L.pop95young	-0.031 **	-0.015	-0.190	0.059	0.023	0.211 ***	-0.190	1.593 ***
L.pop95old	-0.129 *	-0.120	-1.980 ***	-1.528	-0.116	-0.119	-3.745 ***	3.560
L.growth	0.013 *	0.028	0.073 **	1.521 ***	-0.010	-0.047	0.050	0.779 ***
D.growth	0.005	0.019	0.033	0.895 ***	-0.021 ***	-0.035	0.025	0.320
L.grw_neg	-0.049 ***	-0.060	-0.078 *	-1.736 ***	-0.024	0.022	-0.045	-0.399
D.grw_neg	-0.035 **	-0.025	0.000	-1.027 **	0.004	0.036	0.060	0.236
L.grw_sd	0.047 ***	0.000	0.386 ***	-0.029	0.050 **	-0.118	0.955 ***	-0.831 *
Number of obs	992	1001	992	992	989	1001	989	989
R-squared	0.931	0.894	0.985	0.544	0.918	0.881	0.987	0.626
Root MSE	0.408	1.375	1.209	20.56 ₉	0.597	1.952	1.761	15.59 ₁

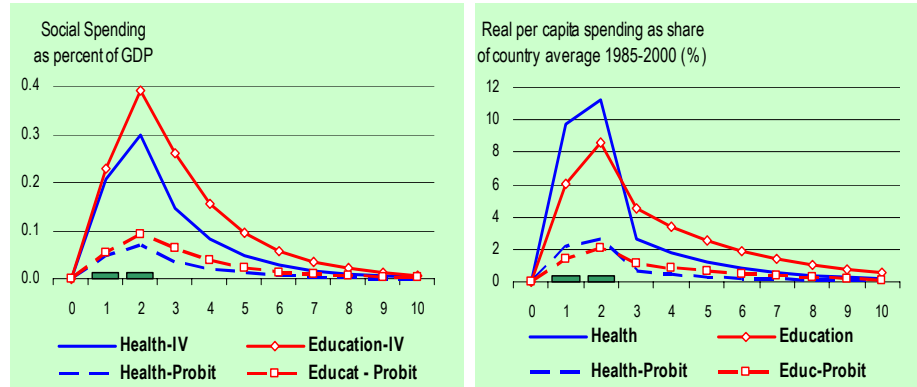
Note: See the text for variable definitions. An initial L indicates a lagged value and D the first difference. IMF(predict) is the estimated value of the IMF variable with the following instruments: lagged values of IMF, growth, CA/GDP, Government Balance/GDP, Democracy index and GDP per capita in U.S. dollars (pc= per capita and DP= domestic prices). The actual estimated equation is:

$$\text{IMF(predicted)} = 0.148 + 0.696 \text{ IMF}(-1) - 0.003 \text{ growth}(-1) + 0.001 \text{ ca}_y(-1) + 0.001 \text{ cgbal}(-1) - 0.043 \text{ democracy} - 0.011 \text{ .gdpusdpc}$$

$$(41.94^{***}) \quad (-2.58^{***}) \quad (-0.69) \quad (0.60) \quad (-3.26^{***}) \quad (-4.85^{***}) \quad R^2 = 0.522$$

Figure 2 uses the regression coefficients from Table 3 to simulate the impact of a two-year IMF-supported program on health and education spending as share of GDP and at constant domestic prices.

Figure 2. Dynamic Effect of a Two-Year Fund Program



To prevent an excessive sense of precision, it also shows the results from one of the alternative estimates discussed in next section (Probit model).²¹ The graphs shows the estimated change in education and health expenditures with respect to what they would have been in the absence of the two-year Fund program. Both types of social spending start to increase the first year of the program and have a larger increase in the second year; there is still a residual effect on the third year (i.e. after the end of the program), which declines geometrically at about 40 percent a year from then on.

The results of Table 3 stand in contrast with the ambiguous results for the group means in Figure 1 and the country time series reported in Table 2. Thus, it is particularly important to explore their robustness with respect to the estimation methodology and the country sample. This is the task of the next section.

V. ROBUSTNESS OF THE RESULTS.

Table 4 summarizes the results of sensitivity analysis.²² Specifically, we consider the following alternatives:

- *Estimation methodology:*
 1. No correction for serial correlation or endogeneity of Fund programs.
 2. Correction for Serial Correlation but not for endogenous Fund programs.

²¹ A probit model differs from the Instrumental Variables (IV) estimate used in Table 3 in explicitly constraining the predicted IMF variable to values between zero and one.

²² See details in Table A1 in the Appendix.

3. Alternative correction for endogenous programs, to take into account that the proportion of the year under a program must be between zero and one (Probit model).
- *Sub samples of countries:*
 - S1. *Excluding nonusers and moderate users:* includes countries with at least one year but no more than six years of Fund programs
 - S2. *Excluding non-users and chronic users:* includes countries with at least one year but no more than ten years of Fund programs
 - S3. *Only repeat users:* includes countries with five or more years of IMF programs.

By comparing alternative estimation techniques, i.e. different rows of Table 4, we see that the first two rows do not produce any strong conclusion about the impact of Fund programs on spending: either the coefficients are not significant or the number of positive coefficients are roughly on balance with the negative ones. There are, however, interesting differences in the four sub samples results shown in the first row, comparing spending with and without the Fund for each country separately. Among countries with five or more years of programs there is a much larger proportion of countries in which social spending are higher in years with programs. A more detailed analysis would be needed to evaluate hypothesis of why this is the case.²³ But these “repeat users” do have significant influence in the results.

²³ E.g. it could be that those countries which are frequent clients are more prone to crisis, which could have a negative impact on social spending.

Table 4. Summary of Robustness Analysis

	S0: Complete Sample (N=146 countries)	Sub samples according to total time under Fund programs during 1985–2000		
		S1: One to Five years (N=53)	S2: One to Ten years (N=88)	S3: Five or more years(N=64)
Time series analysis				
R1. Regressions by Countries	For most countries no significant difference between periods with and without Fund programs. Among countries where differences are significant; with Fund programs more countries had lower spending in U.S. dollars but more in the measures at domestic prices	Small number of countries with significant results.	Similar to the overall sample (S0), but with smaller number of countries with non-significant difference with and without the Fund.	Significant difference between years with and without programs in half of countries; among them, half have higher education spending when there is a Fund program, and two-thirds have higher health spending when there is a program.
Pooled cross-section and time series data				
R2. No correction for serial correlation or endogeneity of Fund programs	No significant difference with and without a Fund program, except for Health/Expend (+) and Education pc in US\$(-). High level of serial correlation in the residuals.	No significant difference. High level of serial correlation in the residuals.	No significant difference except for Education per capita in US\$ (-). High level of serial correlation in the residuals.	No significant difference with and without a Fund program, except for Health/Expend (+) and Education pc in US\$(-). High level of serial correlation in the residuals..
R3. No correction for endogeneity of Fund programs	<i>Health</i> : significant positive impact in all definitions; <i>Education</i> : significant positive impact for GDP and Domestic prices measures.	<i>Health</i> : no significant effects; <i>Education</i> : positive effect as share of GDP; others no significant.	<i>Health</i> : significant positive impact in all definitions; <i>Education</i> : no significant effects.	<i>Health</i> : significant positive impact in all definitions; <i>Education</i> : significant positive impact in all definitions.
R4. Base case. ARIMA model & instrumental var. (Table 3)	All 16 coefficients for contemporaneous and lagged effects positive and all but 4 significant.	No significant coefficient.	All 16 coefficients for contemporaneous and lagged effects positive and all but 6 significant.	All 16 coefficients for contemporaneous and lagged effects positive and all but 2 significant; smaller in magnitude than in the Base Case
R5. Probit model for Fund programs	All 16 coefficients for contemporaneous and lagged effects positive and all but 3 significant; smaller in magnitude than in the Base Case	No significant coefficient.	All 16 coefficients for contemporaneous and lagged effects positive and all but 6 significant; smaller in magnitude than in the Base Case.	All 16 coefficients for contemporaneous and lagged effects positive and all but 2 significant; smaller in magnitude than in the Base Case

The three lower rows of the table shows that the estimation technique does not have much effect on the qualitative results about the impact of Fund programs (the magnitude of the impact does change, as already illustrated in Figure 2).

VI. CONCLUSIONS

This paper has argued that the popular view of the IMF leading to dramatic declines of social spending is not borne out by the available empirical evidence. In fact, the presence of an IMF-supported program tends to either maintain or increase social spending in health and education, measured as either a share of GDP, total expenditures or in real per capita terms. The effect is relatively small and short-lived and particularly significant for countries which are continuing (but not necessarily chronic) clients of the IMF. We found no significant difference between concessional and non-concessional programs. However, our analysis did not include indicators of actual health or educational outcomes. Hence, we presented no evidence of whether the programs affect the efficiency of delivery of those services or their targeting.

Our paper suggests three areas for further research. First, ours is the first attempt we know of to measure the impact of an IMF-supported program on social expenditure using an econometric model. Measuring the impact of the IMF is a very difficult task given the existence of a number of well-known statistical problems (e.g. endogeneity of Fund programs, parameter heterogeneity, serial correlation and unit roots, panel heteroskedasticity, etc.). Although we have been careful to test for the robustness of our results in a number of ways, given the number of potential methodological pitfalls that may affect the study of the impact of IMF-supported programs, the evidence we present can only be taken as tentative. Researchers that have attempted to measure the impact of the IMF on key macroeconomic variables (e.g. growth, the current account, inflation) often get contradictory results that are sensitive to the methodological choices they make. Hence, our evidence only leads to tentative conclusions. Much more analytical and empirical work is needed to evaluate more precisely the impact of IMF-supported programs on social spending.

Second, the main limitation of our study is that it does not allow us to draw any conclusions about the impact of IMF-supported programs on the poor. As noted, social expenditures in developing countries vary enormously in terms of their equity, efficiency and sustainability. One obvious task for further research would be to try to unbundle the direct and indirect impact of IMF-supported programs on the poor using social expenditures as an intervening variable. For example, even if IMF-supported programs managed to maintain constant (or increase slightly) social expenditures during times of budgetary retrenchment, this might not be particularly helpful to protect the poor if expenditures on wages and salaries “crowd out” expenditures on goods and services that more directly benefit the poor. On the other hand, even if social expenditure levels declined, this might not lead to worse poverty indicators if the efficiency or targeting of expenditures increased.

Finally, like all statistical studies, our analysis can point to associations among variables but cannot establish with precision what are the causal mechanisms at work. Hence, another useful way to expand our research would be to draw evidence from in-depth case studies where the transmission mechanisms between the presence of an IMF-supported program, social expenditures and poverty outcomes can be more effectively and convincingly established.

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Table A1. Summary Statistics for the Control Variables for Social Spending

Variable	Description	Number of obs.	Mean	Std. Dev.	Group means	
					With IMF	Without IMF a/
ca_y	current account deficit, share of GDP (%)	2233	-4.610	11.937	-4.620	-4.583
democracy	index of democracy xxx	2336	0.519	0.500	0.562	0.409***
deval	annual change on the real exchange rate (%)	2235	4.274	35.062	4.519	3.665
gdpusdpc	GDP per capita in U.S. dollars	2265	2.214	3.075	2.722	0.934***
growth	annual rate of real growth (%)	2264	2.720	6.791	2.574	3.086
grw_neg	annual rate of growth, when it is negative (=0 otherwise)	2264	-1.275	4.207	-1.444	-0.848***
grw_sd	variability (standard deviation) on the rate of growth	2272	5.250	3.693	5.430	4.794***
health_priv	private expenditures in health as share of GDP (%)	994	2.241	1.412	2.206	2.302
pop95old	share of the population 65 years or older (%)	2144	5.141	3.217	5.195	5.014
pop95young	share of the population aged 0-14 (%)	2160	36.860	8.716	36.181	38.482***
population	total population (millions)	2265	30.439	124.400	34.930	19.125**
reg_AFR	regional dummy for countries in each of IMF Departments: Africa, Asia and Pacific, Europe I,	2336	0.301	0.459	0.244	0.450***
reg_APD	Europe II (countries of the former Soviet Union in Europe and Central Asia) and Western	2336	0.171	0.377	0.201	0.095***
reg_EU1	Hemisphere (America). AFR is used as reference in the regressions	2336	0.096	0.295	0.108	0.065***
reg_EU2		2336	0.103	0.304	0.103	0.103
reg_WHD		2336	0.205	0.404	0.201	0.217
year	Years, from 1985 to 2000.	2336	1992.5 0	4.61	1992.11	1993.52 ***

Note

a/ Statistically significant differences in means are indicated by: *** (99% confidence level) or ** (95%).

Table A2. IMF-Supported Programs and Total Public Spending.

	Total Expenditures		
	Percent of GDP	U.S. dollar pc	DP pc
L Depend. Var.	0.610***	0.619***	0.757***
L. IMF(predict)	0.117	0.050	-0.144
D. IMF(predict)	0.001	0.941	0.864
L. gdpusdpc	-0.076	1.581	1.116
D. gdpusdpc	-0.567	24.923***	0.582
L. devaluation	-0.006	0.048	-0.039*
D. devaluation	-0.012***	0.014	-0.060***
L. year	-0.068*	-0.307	0.231*
L. democracy	-0.432	0.268	-1.202
D. democracy	0.061	0.180	0.018
L. pop95young	0.769***	-4.386***	0.599
L. pop95old	-0.911	-54.201***	4.862
L. growth	-0.122**	0.203	0.668***
D. growth	-0.181***	0.067	0.122
L. grw_neg	0.142	-0.019	0.420
D. grw_neg	0.231**	0.179	0.997***
L. grw_sd	-0.754***	2.230	-0.389
Number of obs	1294	1294	1294
R-squared	0.902	0.983	0.629
Root MSE	3.792	19.54	12.52

Note: a/ Statistically significant differences in means are indicated by *** (99 percent confidence level) or ** (95 percent).

Table A3. List of Countries and Sub samples

Country	Years IMF	S1	S2	S3
Albania	5.71	S1	S2	S3
Algeria	4.81	S1	S2	
Angola	0.00			
Argentina	11.76			S3
Armenia	4.48	S1	S2	
Azerbaijan	4.13	S1	S2	
Bahamas, The	0.00			
Bahrain	0.00			
Bangladesh	6.59	S1		S3
Barbados	1.31	S1	S2	
Belarus	1.00	S1	S2	
Belize	1.24	S1	S2	
Benin	9.61	S1		S3
Bhutan	0.00			
Bolivia	12.10			S3
Bosnia & Herzegovina	1.00			
Botswana	0.00			
Brazil	6.35	S1		S3
Bulgaria	7.34	S1		S3
Burkina Faso	9.77	S1		S3
Burundi	5.26	S1	S2	S3
Cambodia	3.56	S1	S2	
Cameroon	7.86	S1		S3
Cape Verde	1.16	S1	S2	
Central African Republic	2.45	S1	S2	
Chad	8.23	S1		S3
Chile	3.02	S1	S2	
China	0.00			
Colombia	1.03	S1	S2	
Comoros	2.45	S1	S2	
Congo, Dem. Rep. Of	4.42	S1	S2	
Congo, Republic of	5.41	S1	S2	S3
Costa Rica	6.59	S1		S3
Cote d'Ivoire	10.94			S3
Croatia	4.50	S1	S2	
Cyprus	0.00			
Czech Republic	1.00			
Djibouti	2.37	S1	S2	
Dominica				
Dominican Republic				
Ecuador				
Egypt				
El Salvador				
Equatorial Guinea				
Eritrea				
Estonia				
Ethiopia				
Fiji				
Gabon	9.20	S1		S3
Gambia, The	8.55	S1		S3
Georgia	4.08	S1	S2	

Table A3. List of Countries and Sub samples

Country	Years IMF	S1	S2	S3
Ghana	11.78			S3
Grenada	1.64	S1	S2	
Guatemala	2.59	S1	S2	
Guinea	13.38			S3
Guinea Bissau	0.00			
Guyana	10.12			S3
Honduras	6.29	S1		S3
Hungary	7.75	S1		S3
India	1.66	S1	S2	
Indonesia	3.16	S1	S2	
Iran	0.00			
Jamaica	9.73	S1		S3
Jordan	9.42	S1		S3
Kazakhstan	6.05	S1		S3
Kenya	6.99	S1		S3
Kiribati	0.00			
Korea	4.90	S1	S2	
Kuwait	0.00			
Kyrgyz Republic	7.12	S1		S3
Lao PDR	6.63	S1		S3
Latvia	7.13	S1		S3
Lebanon	0.00			
Lesotho	8.72	S1		S3
Liberia	1.43	S1	S2	
Libya	0.00			
Lithuania	5.74	S1	S2	S3
Macedonia FYR	3.41	S1	S2	
Madagascar	9.63	S1		S3
Malawi	10.13			S3
Malaysia	0.00			
Maldives	0.00			
Mali	13.38			S3
Malta	0.00			
Marshall Islands	0.00			
Mauritania	12.16			S3
Mauritius	1.50	S1	S2	
Mexico	8.30	S1		S3
Moldova	5.29	S1	S2	S3
Mongolia	6.29	S1		S3
Morocco	5.95	S1	S2	S3
Mozambique	10.52			S3
Myanmar	0.00			
Namibia	0.00			
Nepal	6.24	S1		S3
Netherlands Antilles	0.00			
Nicaragua	4.99	S1	S2	
Niger	10.96			S3
Nigeria	3.90	S1	S2	
Oman	0.00			
Panama	7.93	S1		S3
Papua New Guinea	4.60	S1	S2	

Table A3. List of Countries and Sub samples

Country	Years IMF	S1	S2	S3
Paraguay	0.00			
Peru	8.27	S1		S3
Philippines	11.92			S3
Poland	5.83	S1	S2	S3
Qatar	0.00			
Romania	5.15	S1	S2	S3
Russia	5.37	S1	S2	S3
Rwanda	5.13	S1	S2	S3
Samoa	0.52			
Sao Tome & Principe	3.18	S1	S2	
Saudi Arabia	0.00			
Senegal	13.93			S3
Seychelles	0.00			
Sierra Leone	6.87	S1		S3
Slovak Republic	1.67	S1	S2	
Solomon	0.00			
South Africa	0.00			
Sri Lanka	6.27	S1		S3
St. Kitts and Nevis	0.00			
St. Lucia	0.00			
Suriname	0.00			
Swaziland	0.00			
Syria	0.00			
Tajikistan	3.18	S1	S2	
Tanzania	10.09			S3
Thailand	4.63	S1	S2	
Togo	12.07			S3
Tonga	0.00			
Trinidad & Tobago	2.07	S1	S2	
Tunisia	4.49	S1	S2	
Turkey	2.45	S1	S2	
Turkmenistan	0.00			
Uganda	11.66			S3
Ukraine	5.08	S1	S2	S3
United Arab Emirates	0.00			
Uruguay	8.47	S1		S3
Uzbekistan	1.24	S1	S2	
Vanuatu	0.00			
Venezuela	4.00	S1	S2	
Vietnam	3.30	S1	S2	
Vincent & the Grenadines	0.00			
Yemen	4.60	S1	S2	
Zambia	7.48	S1		S3
Zimbabwe	6.12	S1		S3