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IMPACT OF IMF ASSISTANCE ON ECONOMIC GROWTH REVISITED[1]

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ABSTRACT. We investigate the effect of IMF assistance on economic growth in a broad panel of countries. We argue that countries are likely self-select into seeking IMF involvement based on their economic performance. We control for such endogeneity by means of instrumental variables. Our findings indicate that the contemporaneous effect of the IMF involvement is insignificant while the lagged effect is positive. The 2SLS effect is larger than the OLS one, indicating that the latter is downward biased.

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Introduction

The International Monetary Fund (IMF) was set up in 1944 with the aim to promote economic and monetary stability and foster economic growth around the world. Since then, the IMF provided financial assistance to numerous developing and developed countries, including, recently, a number of peripheral European countries such as Hungary, Greece and Portugal. The economic effects of IMF assistance have been the subject of an on-going and

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greatly controversial debate. The findings are rather disappointing: the research available so far suggests that the effect on growth has been insignificant and may even have been negative.

In theory, the IMF intervention should improve economic growth both directly and indirectly, for a number of reasons. First, the IMF gives policy advice at the times of crises. Following that advice should help improve the economic climate and thus foster growth in the future. Second, IMF loans frequently have strict conditions attached to them, such as changing the execution of monetary policy or implementing fiscal austerity. The disbursement of IMF loans only takes place if the recipient country adheres to the conditions. Following IMF's advice and accepting the conditionality should have similar effects: improved policy making, if credible, is seen by consumers as indicative of a lower tax burden and higher growth in the future, which leads them to increase their consumption, thus fuelling growth.[2] Finally, the money that is disbursed helps relax financial constraints that the countries face and should stimulate their economies. In particular, as the recent EMU crisis illustrates rather well, in the absence of external financial assistance, crisis-stricken countries would face prohibitively high interest rates.

The literature also highlights possible indirect channels: moral hazard (Vaubel, 1983) and the Dutch Disease (Paldam, 1997; Doucouliagos and Paldam, 2009). The moral hazard argument rests on the fact that being able to apply for assistance from the IMF (and other similar institutions) is similar to insurance. This can give the countries in question incentive to engage in risky or unsound policies. The Dutch Disease hypothesis, in turn, points out that countries with large inflows of foreign currency may experience a pressure on their currency to appreciate, which in turn undermines the competitiveness of their manufacturing firms at international markets. Hence, while the direct channels stipulate a positive effect of IMF assistance, the indirect channels are associated with a negative impact.

An additional issue is that of endogeneity: the countries requesting assistance from the IMF may be already facing imminent economic difficulties at the time they submit their request. Alternatively, out of the countries that apply for financial aid from the IMF, those that receive support tend to be in worse economic situation that those that do not, or the former receive more substantial assistance. The negative or insignificant relationship between IMF assistance and economic growth therefore then can be due to such an endogeneity bias.

Besides endogeneity, another problem with much of the past analytical literature on the IMF involvement and its effect is that it typically only considers how such involvement affects contemporaneous economic performance. If the IMF fosters growth, the positive effect of its assistance may appear only with a lag (Clemens *et al.*, 2012, make a similar point about the effectiveness of developmental aid).

In this paper, we revisit the effect of IMF loans while taking account of the aforementioned criticisms of the previous literature: endogeneity bias and the delay between IMF assistance and its economic effect. To account for endogeneity, we use instrumental variables. Finding suitable instruments, however, is difficult. In particular, the instruments need to possess sufficient explanatory power when it comes to explaining the probability (or size) of IMF assistance without being themselves correlated with growth to allow the analyst to exclude them from the main (second-stage) regression equation. Variables indicative of the economic hardship, such as the countries' indebtedness or interest rates that they are facing when borrowing, are good predictors of the probability that they will seek IMF assistance. However, the same economic hardship is likely to be responsible for the low economic growth that those countries experience at the time of seeing IMF help, or that they will be encountering in the near future. Therefore, we rely on non-economic instrumental variables.

[2] Giavazzi and Pagano (1990 and 1995) argue, for example, that fiscal austerity can stimulate growth in the short term. They argue that Denmark and Ireland in the 1980s both experienced improved growth performance immediately after fiscal reforms.

Specifically, we use the degree of democracy and the United Nations Security Council (UNSC) non-permanent membership. To account for the possibility that the effect of IFI assistance may not occur contemporaneously but with a delay, we allowing the IMF loans to have a lagged effect on growth.

In the following section, we briefly discuss the literature on the economic effects of IMF assistance. We present our data and methodology in Section 3 and the results in Section 4. Section 5 concludes.

1. IMF and Economic Growth

The general finding of the existing literature is that receiving aid from the IMF and other international financial institutions does not stimulate economic growth of the recipient country. Przeworski and Vreeland (2000) find that the country's participation to the program has a negative effect on growth rates as long as countries remain under it. They observe also that as soon as they leave the program, their growth accelerates compared to the period under the program but they do not grow as fast as they would if they had never participated. Dreher (2006) argues that the reason behind the reduced growth rates of the recipient countries can be the self-selection into these programs. Przeworski and Vreeland seek to address this issue. They identify countries that face similar fiscal and monetary problems, foreign reserves crises or high domestic deficits, with some participating in an IMF program and others not. They find that those receiving IMF assistance grow by 2.35% less than the ones that do not, despite displaying similar economic conditions before participation.

Barro and Lee (2003) attempt to address the issue of endogeneity of IMF programs. They argue that the IMF is a "bureaucratic and political organization" so that countries which have more influence in it have better chances to receive a loan, and that loan is likely to be larger compared to countries with less influence in the organization. Therefore, to deal with the endogeneity of the IMF loans, they use instrumental variables that reflect the recipient countries' political and economic connections (such as political proximity to the US and major European countries, trade links with the US and Europe), which they combine with economic characteristics, such as reserves, lagged growth and GDP per capita. Dreher (2006) follows a similar approach, combining economic and political variables. Nevertheless, both papers' results again indicate a significantly negative impact of the participation in an IMF program on the economic growth, with or without accounting for the potential endogeneity bias. A potential drawback of both analyses is that their instruments include economic indicators which are likely to be correlated with contemporaneous economic growth, the left-hand side variable in their second-stage regression. We discuss below how we seek to avoid this weakness.

Dreher, Sturm and Vreeland (2009) examine the relationship between the temporary membership in the United Nations Security Council (UNSC) and the participation in an IMF program. They conclude that there is a strong and significant relationship between UNSC temporary membership and participation to the programs and that the UNSC membership translated into fewer conditions attached to the program. This suggest that IMF loans are potentially motivated by political considerations: countries serving on the UNSC enjoy disproportionate influence and the IMF (or its major shareholders) use IMF loans to secure the support of UNSC members.

A number of previous studies thus sought to account for the possible self-selection into IMF programs using instrumental variables. However, these generally tend to rely on using economic characteristics as instruments. We propose, instead, to use political and institutional characteristics, which are less likely to be correlated with the (observable or unobservable) economic performance of countries before they apply for IMF aid. As both

Barro and Lee (2003) and Dreher, Sturm and Vreeland (2009) observe, political considerations are important predictors of participation to IMF loan programs. Important, such considerations should be largely orthogonal to the economic need for IMF assistance.

2. Data and Methodology

Our data include 213 countries and 38 years (1971 to 2009). The panel is unbalanced since not all observations for all countries and years are available. The data, apart from some exceptions mentioned below, were obtained from the World Bank World Development Indicators (WDI) Edition of April 2012. Descriptive statistics on all variables, including the instruments (see below) are reported in *Table 1*.

The analysis is based on estimating an augmented Solow model of growth (see Mankiw, Romer and Weil, 1992). The dependent variable is the growth rate of GDP per capita. We include population growth and investment (gross fixed capital formation to GDP ratio) as explanatory variables, alongside an IMF loan dummy, the principal explanatory variable. The IMF dummy is constructed so as to take the value of 1 in years during which the country received a loan and 0 otherwise. We consider 3 IMF programs: Stand-by Arrangements (SBA), Extended Fund Facility (EEF) and Poverty Reduction and Growth Facility Arrangement (PRGF). The differences lie in the length of the repayment period, interest rates and eligibility criteria. The dummy takes the value of 1 if the program was in effect for at least 5 months in a particular year. The source of this dataset is the webpage of Axel Dreher and his 2006 paper.

A plausible reason why the previous literature has found a negative effect of IMF loans on economic growth is the endogeneity of IMF assistance: countries seek IMF help, for the most part, when they already face economic problems or are about to face such problems in the very near future. Therefore, there may be reverse causality between the dummy variable for IMF involvement and the growth rate. To find good instruments, however, is invariably difficult. The instruments have to be uncorrelated with the error term; this can be tested by means of the Sargan statistic: insignificant result suggest that the instruments can be excluded from the main regression. Furthermore, we want to ensure that the instruments are not correlated with the economic hardship that the countries are experiencing at the time of applying for IMF assistance. For example, the debt to GDP ratio or another measure of indebtedness would certainly likely to be a strong predictor of participation in IMF programs. However, this is exactly the kind of self-selection based on econ hardship that we argue may bias the results and which we want to eliminate.

Therefore, we focus on instruments that reflect institutional and/or political rather than economic conditions. We select democracy and the United Nations Security Council (UNSC) non-permanent membership (as for the latter, Dreher, Sturm and Vreeland, 2009, find the UNSC temporary membership to be a strong predictor of countries' participation in IMF programs). The UNSC non-permanent membership takes the form of a dummy coded 1 when the country was a member and 0 when not.[3] The data on democracy are obtained from the PolityIV site. The variable takes values between -10 and 10, with the extreme values indicating autocracy and consolidated democracy, respectively.

Finally, loans disbursed in one year may affect the economy in that year or in the subsequent year or years (see Clemens *et al.*, 2012). The effect may be delayed for a number of reasons. Some loans may be allocated relatively late in the year and therefore cannot have much effect on that year's economic outcomes. Furthermore, it may take a while for the effect of such loans (and/or the attached conditions) to work its way through the economy. In

[3] We are grateful to Axel Dreher for making the data available on his webpage.

particular, it is possible for the loans and especially for the attached conditions to be associated with a J-curved effect: the immediate effect is negative, because of the austerity measures required, but the economy rebounds successfully, as the loans and the reforms start having a positive impact on growth. To explore this possibility, we include the IMF dummy in our regressions contemporaneously as well as lagged by up to three years.

3. Results

Table 2 reports the OLS results. The first column presents the results with the IMF variable entering the regression contemporaneously: this regression confirms the general result suggesting that the effect of IMF assistance on economic growth is insignificant. The other two explanatory variables are significant at the 1% level, with the investment having a positive effect whereas that of the population growth negative. To examine how the growth rate behaves over time in relation to the IMF aid, we lag the IMF program dummy by between one and three years (columns 2-4). Doing so results in a striking change in the results: the dummy is significant at the 1 percent level in all three cases. Nevertheless, the effect seems low: participation in an IMF program increases the average annual growth by between 0.68 and 0.82 percent. The effects of the other two explanatory variables remain unchanged.

As we argue above, the OLS results may be biased due to endogeneity of IMF assistance. If this is the case, the growth rate may be falling independently of the IMF program participation. To remedy this, we apply the instrumental variables discussed in the preceding section: democracy (PolityIV score) and UNSC temporary membership. We report the 2SLS results in *Table 3*, again for the contemporaneous effect as well as with the IMF dummy lagged by up to three years. The first-stage F-statistic is always over 10, indicating that our two instruments explain the variation in IMF program participation rather well. In particular, as the first-stage results in the lower part of the Table show, democracy is positively and strongly significantly correlated with the probability of participating in an IMF program: democracies are significant more likely to receive IMF assistance then non-democratic countries. Contrary to our expectations, the UNSC non-permanent membership turns out insignificant. A possible explanation is that the effect of democracy dominates that of UNSC membership. The Sargan statistic is insignificant with the exception of the regression with the 2^{nd} lag of IMF aid: given that our instruments pass this hurdle in three cases out of four, we feel fairly confident that our instruments are valid.

The IMF effect, when examined contemporaneously, is again insignificant. When we lag the IMF dummy, it always turns out positive and significant. Moreover, the magnitude of the effect is increased considerably compared with the OLS results, indicating that the OLS indeed yields downward-biased estimates. The size of the effect rises as more lags are used and the effect of IMF program participation appears sizeable: growth improves, on average, by between 4 and 7 percent per year. After correcting for the endogeneity bias and allowing for a lagged effect of IMF loans, we see that participation in IMF programs indeed has a positive, and powerful, effect on economic growth.

As *Table 1* shows, our data include observations of extremely low and high growth rates. These pertain mainly to countries affected by war (low growth) or recovering from a war (high growth). To make sure that our results are not affected by such potential outliers, we replicate the 2SLS analysis without observations for which the growth rate is outside the [-10,10] range. This leads to dropping 186 observations with growth rates below -10 percent and 2173 observations with growth above 10 percent. The 2SLS results, nevertheless, are qualitatively similar to those in *Table 3*. The main difference is slightly lower magnitude of the coefficients estimated for the IMF effect, ranging from 2.42 for the contemporaneous

effect (which is significant at the 10 percent level) to 5.21 for the 3rd lag. These results are available upon request.

Conclusions

International financial institutions, such as the IMF and the World Bank, disburse sizeable sums of money to countries in need. Yet, the empirical evidence on the effectiveness of that assistance, in terms of fostering economic growth or investment, is disappointing. As the recent overview studies by Doucouliagos and Paldam (2008, 2009) demonstrate, the effect of aid on growth is at best zero. The performance sheet of the IMF is particularly bad, with several studies reviewed in Section 2 of this paper concluding that countries that received assistance from the IMF do subsequently significantly worse than those that did not.

In this paper, we take a second look at the impact of IMF aid on economic growth. We argue that the insignificant or negative results found by the other studies can be due to two facts: (1) the effect of IMF assistance arrives with a lag rather than immediately, and (2) countries self-select to request IMF assistance, so that the relationship between IMF involvement and economic growth is likely to be subject to endogeneity bias. That puts our approach (and results) in line with those of Clemens *et al.* (2012). We allow the IMF assistance to affect growth not only contemporaneously but with a lag of up to three years, and use instrumental variables to remove the potential endogeneity bias. Moreover, we select instruments that are of political rather than economic nature – democracy index and temporary membership of the UN Security Council – to minimize the possibility that the instruments reflect the countries' economic conditions.

The results of our analysis add to the recent literature that paints a more positive picture than the previous contributions (see Jackson, 2014, and Galiani *et al.*, 2014). We find that allowing for IMF assistance to affect growth with a lag is enough to obtain a positive impact on growth, even when using only OLS. Moreover, the longer the lag, the greater is the size of the positive effect. Accounting for the likely endogeneity of IMF assistance, furthermore, increases the size of the estimated effect. With these two methodological modifications, we find that receiving IMF assistance increases the annual growth rate of recipient countries by between 4 (with a lag of 1 year) and 7 percent (3 years' lag).

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Annex

Table 1. Descriptive Statistics

Variables	Min	Max	Mean	Std Dev
GDP per capita growth rate	-50.047	90.470	1.846	6.186
Investment/GDP	-23.763	113.578	22.294	8.542
Population Growth	-44.408	17.738	1.739	1.671
IMF Loans	0	1	0.222	0.416
Democracy	-10	10	0.781	7.453
UNSC	0	1	0.059	0.235

Table 2. OLS Results

	(1)	(2)	(3)	(4)
Investment	0.1607	0.1614	0.1583	0.1631
	(12.75)***	(12.65)***	(12.29)***	(12.58)***
Population Growth	-0.5626	-0.569	-0.5821	-0.6007
	(-6.07)***	(-6.07)***	(-6.18)***	(-6.35)***
IMF Loans	0.1552	0.6844	0.7056	0.8172
	(0.76)	(3.30)***	(3.37)***	(3.87)***
R^2	0.0591	0.0592	0.0588	0.0599
Lag of IMF Loans	0	1	2	3
Number of countries	183	183	183	183
Number of observations	5498	5410	5321	5231
Method of estimation	OLS	OLS	OLS	OLS

Notes: Absolute values of t statistics are shown in parentheses. Significance: * 10%; ** 5%; *** 1%.

Table 3. 2SLS Results

	(1)	(2)	(3)	(4)
	2nd Stage			
Investment	0.1707	0.1624	0.1484	0.1544
	(11.72)***	(11.02)***	(9.84)***	(9.95)***
Population Growth	-0.5208	-0.4778	-0.3910	-0.3396
	(-5.03)**	(-4.57)	(-3.65)	(-2.97)
IMF Loans	3.4548	4.0134	5.7628	6.9738
	(1.61)	(2.20)***	(3.47)***	(4.29)***
Lag of IMF Loans	0	1	2	3
	1st Stage			
Investment	-0.00069	0.00078	0.00101	-0.00040
	(.00100)	(0.00101)	(.00102)	(0.00103)
Population Growth	0.01401	0.00353	0.00005	-0.01015
	(.00717)**	(0.00727)	(0.00731)	(0.00736)
UNSC membership	-0.0226	-0.01715	-0.00977	-0.00224
	(.02324)	(0.02337)	(0.02356)	(0.02372)
Democracy	0.00944	0.01134	0.01272	0.01345
	(0.00142)***	(0.00143)***	(0.00144)***	(0.00146)***
R^2	0.0106	0.0150	0.0191	0.0228
Sargan Statistic (p-value)	0.292 (0.59)	0.284 (0.59)	5.007 (0.02)	0.486 (0.49)
F-statistic 1st stage	11.57	16.10	20.11	23.59

	(1)	(2)	(3)	(4)
Number of countries	104	104	104	104
Number of observations	4484	4388	4290	4190

Notes: Absolute values of t statistics are shown in parentheses. Significance: * 10%; ** 5%; *** 1%. The excluded instruments are democracy (Polity IV score) and UN security-council temporary membership.