tf320@cam.ac.uk 05.01.2017

How Structural Adjustment Programmes Affect Inequality: A Disaggregated Analysis of IMF Conditionality, 1980–2014

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Abstract

Recent years have witnessed a surge of attention to the issue of income inequality, both its causes and consequences. In this article, we draw attention to an important—yet insufficiently understood—determinant of inequality in developing countries: economic reform programmes designed by the International Monetary Fund (IMF). Studying a panel of 131 countries over the period 1980-2014, we use multiple imputation techniques and multivariate regression analysis corrected for non-random selection into Fund programmes. In order to test for specific mechanisms linking the two variables of interest within one year, we disaggregate IMF-mandated reforms (known as 'conditionalities') by policy area under reform. We find that IMF programmes are associated with increases in income inequality. However, the effects of conditionality vary by region and depend on the specific reforms prescribed in programmes. Conditions stipulating fiscal restraint deteriorate income inequality in Sub-Saharan Africa. By contrast, poverty-reduction measures, which increase government expenditure targeted at the poor, tend to be inequality-reducing in the same region. Further, our results suggest that conditionality related to the external sector, often prescribing trade and capital account liberalisation, widen the pay gap both outside Sub-Saharan Africa, and in Sub-Saharan Africa. In the former region, our analysis reveals that financial sector policies exacerbate existing income inequality. Our findings suggest that the IMF needs to carefully consider the design of its mandated policy reforms in order not to adversely affect the income distribution. More generally, we call for increased attention to the multiple ways in which policy reform programmes mandated by international financial institutions, like the IMF, affect income inequality in borrowing countries.

Keywords: International Monetary Fund, conditionality, structural adjustment, income inequality

1 Introduction

In 2016, economists at the International Monetary Fund (IMF) warned that free-market policies the institution is known to advocate may have harmed income inequality (Ostry, et al., 2016). Yet, what is it about IMF-mandated policy reforms that explains changes in the income distribution of borrowing countries? Within-country income inequality levels have increased substantially in most parts of the world over the past three decades. Latin America and Sub-Saharan Africa are noteworthy anomalies, but they remain the most unequal regions of the world. Numerous social and economic consequences have been identified (Dabla-Norris, et al., 2015; Stiglitz, 2012). However, there is still an ongoing debate on the determinants of income inequality. Explanations put forward emphasise the role of institutions, technological change, globalisation, and other factors. Many of these aspects are partly shaped by macroeconomic policies. In developing countries, international financial institutions (IFIs) have substantially increased their influence on policy making since the 1980s through structural adjustment programmes. These programmes aim to change the structure of an economy fundamentally and thus potentially affect income inequality.

One of the most powerful IFIs is the IMF (Woods, 2006). Through the use of the conditions attached to its loan programmes, the Fund is able to induce policy reforms in borrowing countries. In the 1980s, a study by the IMF's Fiscal Affairs Department found no evidence for adverse distributional consequences of the Fund's structural adjustment programmes, however, they acknowledged that individual components of the programmes may have different effects (IMF, 1986 cited in IMF, 1998). From the mid-1990s onwards, the organization has issued guidance notes on how to address inequality (IMF, 1995; IMF, 1996 cited in IMF, 2014), thus recognising the issue of income inequality. However, contributions by IMF staff are increasingly critical of the Fund's ability to address income inequality (Dabla-Norris, et al., 2015; Ostry, et al., 2014; Ostry, et al., 2016).

While previous research has examined the effects of IMF programmes on income inequality (Garuda, 2000; Lang, 2016; Oberdabernig, 2013; Pastor, 1987; Vreeland, 2002), none of these studies identifies and tests the specific mechanisms through which these arrangements operate. Exploiting a newly constructed database on IMF conditionality based on expert coding of individual conditions from IMF programmes (Kentikelenis, et al., 2016), we advance on previous research by examining the specific policy mechanisms through which IMF programmes affect income inequality within one year in a panel of countries between 1980 and 2014. In so doing, we innovate methodologically by using multiple imputation techniques, therefore accounting for the uncertainty of the Gini estimates from the Standardised World Income Inequality Database (SWIID). To the best of our knowledge, this has been thus far neglected in the relevant literatures (e.g., Acemoglu, et al., 2015; Oberdabernig, 2013), potentially distorting results.

Our results indicate that, overall, IMF programmes increase income inequality. However, the effects of conditionality vary depending on the policy areas under reform and by region. When we split the data into samples covering economies within, and outside of, Sub-Saharan Africa—one of the poorest regions of the world—the results differ substantially. Fiscal policy conditions, restricting government expenditure to restore a balanced budget, increase income inequality in Sub-Saharan Africa. By contrast, poverty-reduction conditions, implying higher government expenditure, reduce income inequality in the same region, although this relationship is only modestly robust. Conditions of the external sector, stipulating trade and capital account liberalisation, widen wage disparities throughout. Finally, the Fund's financial sector conditions entail measures to control inflation and appear to increase income inequality in the non-Sub-Saharan Africa sample only.

This article is structured as follows. Section 2 discusses IMF conditionality and the theoretical pathways through which IMF arrangements affect income inequality. Section 3 provides a description of the variables used and the estimation technique. Section 4 and 5 present our results and report on robustness checks. In the final section, we contextualize the findings and identify some limitations, policy implications, and directions for future research.

2 Income Inequality and IMF Conditionality

Rising within-country income inequality is among the key contemporary policy challenges, and as one of the Sustainable Development Goals, it has been given a prime place in the current development strategy debates. A voluminous body of recent social-scientific literature has drawn attention to the multiple adverse social, economic and political impacts of increased inequality (Atkinson, 2015; Dabla-Norris, et al., 2015; Stiglitz, 2012; Wilkinson & Pickett, 2010). However, while the consequences of income inequality are well understood, its causes remain subject to intense discussion. IFI-mandated structural adjustment programmes have been hypothesised to be one such explanatory factor (e.g., Oberdabernig, 2013). Enjoying almost universal membership and a global reach through its lending arrangements, the IMF is one of the most powerful IFIs. (Woods, 2006). Thus, investigating the role of the IMF with regard to income inequality may inform recent debates on the determinants of inequality.

The Fund's most powerful instrument to induce policy reforms is conditionality: the conditions borrowing countries need to fulfil in exchange for financial resources. Not mentioned in the original Articles of Agreement in 1944, the use of conditionality was controversial from the beginning (Babb, 2003).[1] In 1977, the IMF started targeting structural change (Boughton, 2001). Over time, such arrangements became ubiquitous, and IMF arrangements became more complex and intrusive (Babb & Carruthers, 2008). At the same time, the Fund began advocating a set of free-market policies—stabilisation, liberalisation, privatisation, and deregulation (Summers & Pritchett, 1993)—that later became known as the Washington Consensus (Woods, 2006). IMF conditionality thus expanded coverage to a broad range of policy areas (so-called 'scope of conditionality'). This broader scope implies multiple pathways through which IMF programmes link to income distribution. Before discussing these mechanisms, we briefly review existing literature on the topic.

2.1 Existing Evidence on the IMF and its Impact on Income Inequality

Previous quantitative studies find that IMF programmes have adverse distributional consequences (Garuda, 2000; Lang, 2016; Oberdabernig, 2013; Pastor, 1987; Vreeland, 2002). For instance, research comparing various economic measures pre- and post-programme found a reduction in the labour share of income (Pastor, 1987). Garuda (2000) deployed propensity-score matching and found a significant worsening of the income distribution. However, both these early contributions were constrained by small samples and endogeneity bias. A pioneering study by Vreeland (2002) introduced controls for non-random selection, showing that the income share of labour in the manufacturing sector is likely to decrease in countries with IMF programmes. Oberdabernig (2013) builds on Bayesian Averaging of Classical Estimates to assess the impact of IMF programmes on poverty and income inequality. Although she also found that the Fund's programmes increase inequality overall, the programmes had an inequality-decreasing effect for the sub-period 2000-2009. Most recently, Lang (2016) revealed that IMF-mandated reforms deteriorate the income distribution substantially in democratic countries, while being inequality-neutral in non-democracies.

[1] See Vreeland (2003) and Woods (2006) on the evolution of the IMF; Babb and Carruthers (2008) as well as Dreher (2009) review the theory and evidence of conditionality.

However, due to data limitations, none of these studies evaluated the specific mechanisms or assessed conditionality more closely. Thus, all aforementioned articles identified an aggregate treatment effect of an IMF programme, and therefore neglected a more nuanced picture involving the degree of conditionality. This paper is—to our knowledge—the first to identify and test several pathways through which IMF programmes affect income inequality.

2.2 Mechanisms through which the IMF Affects the Income Distribution

To trace out how the IMF influences income inequality, we disaggregate the arrangements according to the policy areas affected. In this analysis, we focus on mechanisms that impact the income distribution within one year. As a consequence, reforms that take several years to implement or translate into changes of the income distribution, such as privatisation, are beyond this analysis. We thus propose four mechanisms through which IMF conditionality could plausibly affect the income distribution: fiscal consolidation conditions, poverty-reduction measures, the external sector, and the financial sector. In all these cases, the IMF does not stipulate conditions directly pertaining to the income distribution. Rather, the Fund's conditionality indirectly affects income inequality by moderating the impact of macroeconomic determinants.

First, fiscal consolidation measures—entailing policy reforms that lower government expenditure or increase public revenues in order to restore a balanced budget—are a cornerstone of IMF structural adjustment programmes. These measures have been linked to higher inequality (Agnello & Sousa, 2014; Ball, et al., 2013). For instance, periods of austerity often result in higher unemployment, with the poor potentially being disproportionately affected (Ball, et al., 2013). Austerity might also lower economic growth. Indeed, IMF arrangements reduce the rate of economic growth (Dreher, 2006; Vreeland, 2003). At the same time, reduced economic growth is itself a key consequence of income inequality (Ostry, et al., 2014). In this paper, we consider fiscal issues that restrict public spending and thus reflect the expenditure dimension of fiscal consolidation. The impact on income inequality depends on the distribution of the spending cuts—i.e., whether the bottom of the income distribution is disproportionately affected.[2]

Second, IMF programmes can reduce income inequality through poverty-reduction measures. The establishment of the Poverty Reduction and Growth Facility (since 2009 known as the Extended Credit Facility) in the late 1990s indicated the IMF's explicit focus on issues of poverty and inequality and signified the introduction of pro-poor spending conditions. These target the lower end of the income distribution by requiring governments to increase spending on health and education. Thus, the conditions aim to offset adverse effects of broader fiscal policy measures (discussed above) and we therefore expect the poverty-reduction measures to be associated with lower income inequality.

Third, we posit that conditions of the external sector also impact the income distribution. The Fund has repeatedly argued for fewer restrictions on goods and capital flows as part of its structural adjustment programmes. Especially for (labour-abundant) developing countries, proponents of trade liberalisation argue that the removal of trade barriers lowers income inequality as the volume of trade increases and living conditions of employees in exporting sectors improve. However, the realisation of these gains is contextual (Rodrik, 2011). Studies by authors not affiliated with IFIs find that trade exacerbates income inequality for some groups of countries (Bergh & Nilsson, 2010; Dreher & Gaston, 2008; Goldberg &

[2] Instead of reducing expenditure, the government may increase taxes, or raise revenue by privatisation of state-owned enterprises. However, the analysis of their distributional effects is complex (Birdsall & Nellis, 2003; Claessens & Perotti, 2007). Further, since some of the effects may take several years to translate into changes of the income distribution, these dimensions of fiscal consolidation are beyond the scope of this paper.

Pavcnik, 2007; Meschi & Vivarelli, 2009). By contrast, a study by IMF staff concludes the opposite (Jaumotte, et al., 2013). Liberalising capital accounts is expected to improve macroeconomic indicators through higher foreign direct investment (FDI). In different studies, FDI has been associated with higher growth and improved human capital formation. Yet, financial development (Roine, et al., 2009) and capital account liberalisations (Furceri & Loungani, 2015) tend to favour the top of the income distribution and increase inequality. The threat of capital flight due to less restrictions may also lead to suboptimal policy decisions in borrowing countries (Babb, 2005). In addition, FDI and trade are substitutes to a certain extent. Countries with restrictions on flows of goods might attract higher FDI, and *vice versa*. Thus, the overall impact of external sector conditionality on income inequality is theoretically ambiguous.

Fourth, conditionality in the financial sector may affect the income distribution. The Fund advises on the conduct of monetary policy, initiates the privatisation of financial institutions and specifies targets for the inflation rate. Overall, this set of conditions aims at stabilisation of the financial sector. Indeed, IMF arrangements are associated with a lower probability of currency crises (Dreher & Walter, 2010). Likewise, evidence that IMF arrangements reduce inflation is promising (Bird, 2007). With regard to income inequality, it matters that central banks often raise interest rates to combat high inflation. Creditors—as opposed to debtors—stand to benefit from this policy. More generally, if access to financial services and markets is unequal—as is often the case in developing countries (Claessens & Perotti, 2007)—these conditions potentially exacerbate existing inequalities. In this case, the gains of a reduction in inflation or an improvement in investor confidence accrue disproportionately to the rich. For example, some have argued that the central banks' policy response to the recent financial crisis has further helped those at the top (Stiglitz, 2012, p. xi). Thus, we expect IMF measures in the financial sector to distort the income distribution.

Not only the number of conditions potentially affects the income distribution, so does the scope of conditionality: We suggest its impact on income inequality depends on the government's preferences with regard to redistribution, the (expected) effect of an IMF programme, and the government's ability to react or offset these effects. The determinants of the scope of conditionality have been discussed elsewhere (Bird, 2009; Dreher, 2006; Stone, 2008). However, it is unclear whether a given number of conditions in a narrow area or broader coverage involves more conditionality, and this ambiguity may account for different interpretations of evidence (Bird, 2009). With respect to income inequality, we put forward an explanation according to which, *ceteris paribus*, broader coverage involves less conditionality. The government has the mandate to realise the electorate's preferences for the income distribution. In order to do so, policy space and resources are required. If IMF programmes cover a narrow scope, the impact of affected sectors on income inequality is predominantly determined by the structural adjustment reforms. By contrast, if conditions are allocated across a large number of policy areas, the government has relatively more policy space to implement alternative or additional measures, potentially countervailing (or amplifying) the impact of the Fund's prescribed reforms. Thus, all other things being equal, broader scope of conditionality leaves the government with more room in specific policy areas to manoeuver the economy towards its target level of income inequality.

In short, it is plausible that fiscal issues widen income inequality. By contrast, we expect poverty-reduction policies to lower income inequality. Moreover, measures liberalising the external sector and conditions pertaining to the financial sector may well have adverse effects and exacerbate existing inequalities. Irrespective of the pathway, the scope of conditionality is one additional aspect to be considered in IMF programme evaluations; however, its impact on the income distribution is conditional on specific

circumstances of borrowing countries. In the next section, we outline the research design to test these theoretical propositions.

3 Research Design

3.1 Variables

Data on the Gini coefficient of net income, the dependent variable, are from the Standardised World Income Inequality Database (Solt, 2016), as are the data on the Gini coefficient of market income, which we use for robustness checks. Solt exploits systematic relationships among different Gini coefficients and employs an algorithm for missing data, taking the Luxembourg Income Study as the baseline. The data on the Gini coefficient consist of 100 estimates per country-year observation. These reflect the uncertainty of the calculations. To control for this, our analysis builds on multiple imputation techniques. Otherwise, standard errors are underestimated (Solt, 2016)—especially so for developing countries with incomplete and imprecise data on income inequality—and the regression results are overly optimistic in terms of their statistical significance. This dataset, and the adjustment to coefficients, standard errors, and measures of goodness of the fit are described in Appendix 7.1.

Explanatory variables of interest are IMF programme participation, the number of conditions, and the scope of conditionality. IMF programme participation is a binary variable, taking the value of one if an IMF programme has been in effect for at least five months in a specific year, and zero otherwise. This definition follows Dreher (2006).

The number of binding conditions indicates how much conditionality an IMF programme involves. The IMF formally distinguishes five types of conditions specifying the relative weight it attaches to its implementation. These types can be clustered into hard (binding) or soft (non-binding) conditions (Woods, 2006, pp. 70-71). Since binding conditions (BA2) are the ones the Fund places most weight on, we only consider these. Their implementation is most relevant for the scheduled disbursement of loans (Stubbs, et al., 2016). As a robustness check, we correct for implementation by assessing whether or not a programme was interrupted, before discounting conditions during the interruption period (dBA2). An interruption is defined as a delayed programme review. Once again, we only consider binding conditions for this implementation-discounted count.

Yet, the number of conditions is an imperfect measure for the extent of conditionality because it neglects the variety of policy areas affected or the degree of difficulty to implement them. Thus, we also include the scope of conditionality, summing the number of policy areas covered by an arrangement (IEO, 2007; Kentikelenis, et al., 2016; Stone, 2008). See Appendix 7.2 for the description of the 13 mutually exclusive and collectively exhaustive policy areas. Since the number and scope measure different aspects of IMF arrangements we control for both (one variable on its own implies that the model suffers from omitted variable bias). As already noted, this consideration is one way we advance on previous research of IMF programmes and income inequality.

Control variables are the macroeconomic determinants discussed above. Research suggests that the stage of development of an economy matters. We therefore include GDP per capita (the natural logarithm), life expectancy, and the dependency ratio, all approximating the level of economic development. Moreover, we account for trade (imports and exports in terms of GDP), and two measures of financial openness—*de jure*, i.e., the Chinn-Ito Index of Financial Openness (Kaopen); and *de facto*, foreign direct investment (net capital inflows as a percentage of GDP), FDI. Inflation reflects monetary policy, while government consumption in terms of GDP approximates fiscal policy. Political variables include indicators for the orientation of the leading party, and a democracy index for political regime,

because left-wing governments and democracies (for both variables indicated by higher numbers) are expected to be less tolerant to income inequality. These are the baseline controls. For robustness checks, we additionally include the rate of unemployment, a measure for human capital, and the share of urban population. Appendix 7.3 provides the definition, source, and summary statistics of the variables.

3.2 Estimation Techniques

Our data cover a maximum of 131 countries over the period 1980-2014, with the total number of observations depending on the model specification. The baseline model is estimated as follows:

$$Gini_{it} = \alpha + \beta_1 IMF_{it-1} + \gamma' X_{it-1} + \mu_i + \nu_t + \varepsilon_{it},$$

where $Gini_{it}$ is the Gini coefficient of net income. The coefficient of interest is β_1, indicating the marginal effect of an IMF programme. X_{it} denotes a vector of control variables, as discussed above. In addition, we control for time-invariant country specifics, μ_i, and time effects across all countries in the sample, ν_t. Any effect of IMF arrangements and the control variables on income inequality is unlikely to materialize instantaneously. To allow for any delayed effect, the explanatory variables are lagged by one period, which is standard in the literature (e.g., Oberdabernig, 2013; Vreeland, 2002). We estimate the equation using fixed effects, thereby considering only within-variation. In addition, we compute heteroscedasticity-robust standard errors and cluster them on the country-level in order to account for autocorrelation. For subsequent analysis, we include the number of conditions and the scope of policy areas covered by an IMF arrangement. The interpretation of the IMF dummy changes with the inclusion of further IMF-related measures. It now reflects the marginal effect on income inequality beyond the number and scope of conditions.

There are various potential sources of endogeneity. Reverse causality implies that the level of inequality determines whether a country participates in an IMF programme or not. This is a concern if a high degree of inequality in a country changes politics in a systematic way such that it affects the decision to participate in IMF programmes. The more pressing issue, common to all studies on IMF programme evaluation, is non-random sample selection. Countries under an IMF arrangement are unlike non-participating economies. One can control for many economic and political variables that determine participation. In addition, fixed effects estimation mitigates endogeneity due to time-invariant country specific variables. However, evidence suggests this is insufficient because certain relevant unobservable variables are time-varying, e.g., political will or trust (Vreeland, 2003, p. 107). A government that participates in an IMF programme in order to have international support for liberalising trade and capital accounts might be willing to accept higher levels of inequality. Thus, a third, effectively omitted variable determines both the (binary) explanatory variable of interest and the dependent variable.

One approach to address this issue is to use instrumental variables (IV) and estimate the model with two-stage-least-squares (2SLS). First, the endogenous variable is estimated with a relevant, but exogenous instrument. Second, the predicted values from the first stage are used in the original model of interest in place of the observed endogenous variable. Therefore, one needs an instrument that explains variation in IMF programme participation (the relevance condition), but is not correlated with income inequality (the exclusion condition) to obtain consistent estimates. The former can easily be tested. However, IV estimates tend to be highly unstable and imprecise with weak instruments (Angrist & Pischke, 2008, p. 155). On the other hand, the exclusion condition needs to be taken on faith and defended on theoretical grounds. One instrument commonly used in the literature on IMF programmes is a variable measuring voting in the UN General Assembly (Barro & Lee, 2005). Another political variable found to explain IMF programmes is temporary UNSC membership (Dreher, et al., 2015). As Lang

(2016) discusses, neither variable suits the study of income inequality, because both reflect political preferences and the exclusion condition can therefore not be defended. There is also an additional concern. By using OLS for a bivariate variable in the first stage, predicted values are not bounded by zero and one. Thus, even if one finds a highly relevant and exogenous instrument, questions still remain as to whether IV/2SLS is the most appropriate approach for evaluating IMF programmes and income inequality.

Alternatively, one can use Heckman's two-step method to control for the selection bias. Consider again the example of political will as omitted variable. As part of the disturbance term, it causes unexplained variation in the selection of IMF programmes but also in the outcome equation explaining income inequality. Heckman (1979) uses these characteristics to account for the non-random selection. The correlation of the error terms in both equations is captured by the inverse Mills ratio, which is used as an additional control in the outcome equation. This two-step method then controls for the unobservable variables causing the selection bias. Similar to many previous evaluations of IMF programmes (e.g., Clements, et al., 2013; IEO, 2003; Kentikelenis, et al., 2015), we use this method to address the non-random sample selection. For the selection equation, standard determinants of IMF programme participation are explanatory variables. In addition, we include an exogenous interacted variable as instrument, drawing on recent methodological innovations in political science (Dreher & Langlotz, 2015; Lang, 2016; Nunn & Qian, 2014). We construct a compound instrument based on the interaction of the within-country average IMF programme participation and the period-specific budget constraint of the Fund. Appendix 7.4 discusses Heckman's two-step method and the selection equation in more detail.

In order to go beyond the aggregate effect of an IMF programme, we use the number of conditions covering a specific policy area—as opposed to the total number of conditions—to test individual mechanisms. Recall that the IMF moderates the effect of macroeconomic determinants. By including controls which are related to income inequality, less variation is left to be explained by the IMF measures. Thus, the inclusion of the variables that are relevant for a pathway corresponds to a very stringent test of the IMF's impact on income inequality. To capture such a moderation effect of the IMF, we include interaction terms, i.e., $BA2PA \times Y_{it-1}$, where Y_{it-1} is any macroeconomic variable we suspect the IMF to moderate with regard to the income distribution. We therefore test for individual mechanisms as follows:

$$Gini_{it} = \alpha + \beta_1 IMF_{it-1} + \beta_2 BA2PA_{it-1} + \beta_3 BA2NPA_{it-1} + \beta_4 BA2SCO_{it-1} + \beta_5 BA2PA \times Y_{it-1} + \gamma' X_{it-1} + \mu_i + \nu_t + \varepsilon_{it}$$

$BA2PA$ are the number of binding conditions (BA2) of a certain policy area, whereas $BA2NPA$ are the number of remaining conditions (of the policy area not under consideration). While we control for the scope calculated on the basis of binding conditions, $BA2SCO$, the vector of controls includes an interaction of the remaining number of conditions with the macroeconomic variable of interest ($BA2NPA \times Y_{it-1}$). The other variables are defined as above. The coefficient of interest to test the pathways outlined above is β_5. To illustrate our estimation technique, consider policies related to the external sector: One potential pathway through which IMF arrangements affect income inequality is through trade. Given that we already include trade as a control, it might absorb much of the effect of the IMF programme. To test the mechanism as described above, we regress the Gini coefficient of net income on the Heckman-corrected IMF dummy for programme participation, the number of conditions in the external sector, the remaining number of conditions, the scope, the interaction between the number of external conditions and the trade variable, and all the controls (which now also include the interaction of trade with the remaining number of conditions). Because the number of conditions is

strictly positive for participating countries, the sign of the interaction term is always determined by the macroeconomic variable.

The interpretation would then be as follows: Suppose free trade reduces inequality. In this case, the coefficient on trade (one of the controls) is negative. The coefficient on the interaction term then indicates how the IMF moderates this effect. If conditions of the external sectors are inequality-narrowing through their impact on trade, the sign of the interaction is negative, too. This indicates that the Fund helps in some way related to increased trade to reduce inequality even further in borrowing countries (e.g., due to technical advice by the Fund or the monitoring of the correct implementation). By contrast, a positive coefficient on the interaction term suggests that the IMF-mandated policy reforms have adverse distributional consequences if trade increases (e.g. because the structural adjustments are too intrusive). Depending on the magnitude of the coefficient, the overall effect of trade on inequality could even be reversed such that the marginal effect of trade is inequality-increasing. Since there is no extensive literature on the selection of specific conditions (for an exception, see Wei & Zhang, 2010), the estimates of the number of conditions are not corrected for any non-random selection. This is a limitation we acknowledge in the discussion.

For several reasons, we believe the results might be different in Sub-Saharan Africa (SSA), as opposed to other regions in the sample (see also Kentikelenis, et al., 2015). Among the poorest countries and given their colonial legacy, Sub-Saharan African economies receive special attention from the international community (Gereffi & Fonda, 1992; United Nations, 2001; World Bank, 1994). As a consequence, the number of IMF programmes, their content, and impact on income inequality may be systematically different in SSA relative to other regions. Figure 1 plots the Gini coefficient of net income over the sample period examined. It reveals a marked different trajectory by region. While income inequality has decreased slightly in SSA since 1980, the income distribution outside SSA—albeit on a lower level—has become more unequal over recent decades. However, to understand whether IMF programmes explain some of these changes, we need to employ the econometric methods outlined in this section.

[Figure 1]

4 Findings

First, we present evidence from the baseline model, considering only a binary variable for the IMF programme. Next, we extend our analysis to include the number of conditions and scope. Finally, we test the mechanisms outlined in Section 2.

4.1 Baseline Model

As discussed, existing research has highlighted the need to investigate Sub-Saharan Africa separately due to the special role of these economies in international development debates (Kentikelenis, et al., 2015). Our results conform to this; a Hausman test comparing the coefficients for Sub-Saharan Africa versus all other regions suggests systematic differences in the underlying determinants of income inequality. Table 1 presents the baseline model for the full sample, Non-SSA, and SSA separately. For these estimations, we regress the Gini coefficient of net income on the IMF binary variable, all baseline controls, and include the inverse Mills ratio for the Heckman correction.

[Table 1]

For the full sample (model 1), the IMF variable is positive and significant at the 10% level. Thus, like previous studies, the baseline model suggests that IMF programmes, on average, increase income inequality. However, running the regression by different regions (model 2 and 3) reveals a substantially

different magnitude of the effect and the coefficient turns insignificant. Thus, IMF programmes could also be inequality-neutral. However, the theoretical discussion of the different pathways indicated that conditions have different expected effects on the income distribution. Thus, it is plausible that the binary variable—capturing an aggregate effect—masks that different conditions offset each other with regards to income inequality over the time period considered. The inverse Mills ratio is significant at the 10% level for Sub-Saharan Africa, suggesting that unobservable variables driving the selection of IMF programmes are associated with lower income inequality.

Many of the control variables are insignificant, most likely as a result of fixed effects estimation, which uses only within-country variation. Due to fairly persistent macroeconomic variables, the overall explained variation in the Gini coefficient is rather low. Further, the literature on the macroeconomic determinants of income inequality allows for different coefficients by regions, and we do not interpret the control variables in detail. Next, we start exploiting the available data on IMF programmes in more detail. As discussed, the results for the regions differ significantly. In the following, we therefore report results for sub-samples only.

4.2 Number and Scope of Conditionality

In the baseline model, the binary IMF variable captures all effects of an IMF agreement. However, programmes differ with regard to their complexity and intrusiveness. Thus, we use the number of conditions and scope of conditionality to evaluate IMF arrangements in more detail. Table 2, controlling for both these measures, reveals even more substantial differences by region.

[Table 2]

Considering model 1 for countries outside Sub-Saharan Africa first, the sign of the IMF dummy has now turned negative. However, it is highly insignificant and therefore suggests the number and scope of conditions capture most of the Fund's impact on income inequality. The former is positive, and significant at 5%. Thus, every additional condition, *ceteris paribus*, increases income inequality. By contrast, the scope of conditionality is negative, at the 10% level of statistical significance. Our theoretical discussion of the scope of conditionality offers an explanation for this result. A broader scope, all else being equal, involves less conditionality. As a consequence, there is still policy space for the government to realise its preferences for the income distribution. If the level of income inequality is deemed to deviate from the target due to an IMF programme, borrowing governments may implement additional, inequality-decreasing measures.

For Sub-Saharan Africa (model 2), all IMF measures are insignificant at conventional thresholds of statistical significance. In contrast to Non-SSA, the estimate of the coefficient on the binary IMF variable is positive and substantial. This implies that IMF programmes beyond the number and scope of conditions affect the income distribution. For instance, one could think of the Fund's technical assistance or catalytic effects on aid, which is—to a degree—independent of programme specifics. The number of conditions is also positive, and the scope of conditionality is negative. Put differently, an IMF programme potentially evokes offsetting policy responses with regard to income inequality to satisfy the electorate, which is capture by the scope variable. Some relevant questions are still unanswered, though. How is the scope determined in negotiations? Do governments or the IMF have strong preferences with regard to individual policy areas? Due to these unknowns, we acknowledge the importance of the scope of conditionality by including it in our subsequent models but we treat it primarily as an additional control.

This model, controlling for the number and scope of conditions, as well as the selection-adjusted binary variable of programme participation, captures a wide range of the Fund's structural adjustment programmes. It is time to take stock. We evaluate the effect of an IMF programme at the mean and median. For countries with an IMF arrangement outside Sub-Saharan Africa, the average number and scope of conditions is 25.6 and 4.2, respectively. The corresponding median values are 26 and 4. Thus, our best estimate for the overall effect of an average IMF programme is that the Gini coefficient increases by 0.070 (at the median: +0.111) per year with an IMF arrangement. For economies of Sub-Saharan Africa, the mean values of the number of conditions and scope are 22.3 and 4.2 (median: 24 and 5). This corresponds to an overall effect of +1.634 at the mean (+1.520 at the median). While we can see that the number of conditions and scope seem to offset each other largely for Non-SSA, IMF programmes have an inequality-widening effect in SSA. These findings are in line with the existing literature on the IMF and income inequality.

Consider two examples from our data. Firstly, Paraguay had an IMF programme from 2004 until 2008. The number and scope of conditions differed by year, ranging from 16 to 57, and 5 to 7, respectively.[3] Our point estimates imply that the marginal effect of the IMF was a decrease in the net Gini coefficient of 0.276 for this programme. Secondly, Angola had only one programme in the period our database covers, from 2010 until 2011. The number of conditions was 28 and 25, with the scope defined by our measures of 5 and 4. This corresponds to a net increase of the Gini coefficient due to the IMF programme of 3.352. These changes in income inequality are substantial. However, recall that some of the coefficients are insignificant, especially in Sub-Saharan Africa. Hence, although it is our best estimate, the true effect of an average IMF arrangement could still be inequality-neutral. We therefore investigate components of IMF programmes in more detail next.

4.3 Individual Mechanisms through Policy Areas

The analysis of specific mechanisms builds on the policy areas and pathways discussed in Section 2.2. First, the analysis of fiscal issues measures supports the theorised relationship. Table 3 indicates that a reduction in government expenditure, which these conditions stipulate, increases income inequality.

[Table 3]

Throughout, the number of fiscal policy conditions is positively related to income inequality, while the coefficient on the interaction of government expenditure with fiscal issues is negative. However, these effects are only statistically significant in Sub-Saharan Africa (model 2). The result suggests that, *ceteris paribus*, an additional fiscal policy condition has adverse distributional consequences beyond government expenditure. This effect is significant only at the 10% level, though. More importantly, and explicitly related to our hypothesis, a reduction in government expenditure is more detrimental in countries opting for IMF assistance relative to non-participating states.

Second, it is reasonable to expect the impact of poverty-reduction measures to be stronger in Sub-Saharan Africa. Countries of this region are among the poorest and thus also targeted often by the Fund with these pro-poor conditions. Table 4 presents the evidence on this hypothesis.

[Table 4]

[3] Over the period of 2004-2008, the number of conditions was 57, 22, 25, 25, and 16. During the same time, the scope of conditionality of the IMF programme was 7, 6, 6, 5, and 5.

The interaction term of the poverty-reduction conditions with government expenditure has the expected effect, but is not significant at standard thresholds. That is, an increase in government expenditure reduces income inequality more in countries with an IMF programme than those without. Note that the number of conditions related to poverty-reduction is large in magnitude and significant at the 1% level in SSA (model 2). This reflects most likely a selection effect: Countries with high inequality in Sub-Saharan Africa tend to receive poverty-reduction measures. As already pointed out in the description of the estimation technique, the IMF variables of the policy areas are not corrected for endogeneity due to non-random selection. Further research should do so.

Third, turning to the external sector, we test that IMF programmes moderate the relationships between income inequality and the volume of trade, foreign direct investment, and the Chinn-Ito Index of financial openness, as depicted in table 5.

[Table 5]

The findings support that, in Non-SSA at 5% (model 1), IMF programmes increase income inequality through the adverse effects of *de facto* financial openness (FDI). If run separately, the interaction of trade with the number of conditions of the external sector is also significant and positive, thereby further exacerbating inequality. These results are not reported here due to space constraints. For SSA (model 2), it is the *de jure* measure of financial openness (the Chinn-Ito Index of financial openness, Kaopen) which widens the pay gap in countries with IMF participation (both significant at 5%). In a recent interview, the IMF's chief economist, Maurice Obstfeld, has acknowledged that measures limiting capital flows might be helpful in some circumstances (IMF, 2016). We find that the concern of income inequality is one such condition where countries seem to be better advised restricting free capital flows. These models corroborate existing theories that suggest capital account liberalisation has detrimental effects with regard to income inequality.

Finally, we test whether—with respect to the financial sector—IMF programmes affect income inequality through inflation. We would like to investigate the role of investor confidence, but due to data limitations we are unable to do so.

[Table 6]

Table 6 indicates that in economies not participating in an IMF programme, the rate of inflation increases income inequality (the coefficient on inflation). By contrast, the marginal effect of an IMF programme is negative with regard to inflation and income inequality (model 1 and 2). These results suggest that conditions inducing the reduction of inflation actually widen the pay gap. This is in line with the mechanism we suggested earlier, namely, that a reduction in the rate of inflation, potentially due to increases in the interest rate, exacerbates existing inequalities. However, we fail to reject the null hypothesis in any case of the inflation-related variables.

These results mostly conform with the theoretical mechanisms we outlined earlier. However, support for the hypotheses is mostly conditional, because the impact differs substantially by region. Fiscal issues reflecting austerity policies widen income inequality in SSA. By contrast, poverty reduction measures coupled with higher government expenditure can reduce income inequality. Holding across all regions, trade conditionality widens the pay gap. Finally, our evaluation of financial sector measures indicates that the top end of the income distribution may benefit disproportionately from contractionary monetary policy. Not all of these results are significant at standard thresholds of statistical significance, though. This imprecise estimation could result from a low number of observations, little variation in the

explanatory variable, multicollinearity among the regressors, or simply because the relationship is not very strong. The following section on robustness checks addresses some of these issues.

5 Robustness Checks

The results described above are robust to another dependent variable, i.e., the Gini coefficient of market income, to the exclusion of outliers, to a different measure of the condition count of IMF measures, and to the inclusion of additional variables.

As a first robustness check, we evaluate the different mechanisms with the Gini coefficient of market income. We do not expect the results to be identical, because the net Gini coefficient already incorporates the policy response to the market distribution of incomes. Nonetheless, the effect of the IMF programme should be largely consistent. See Appendix 7.5.1 for the results.

The fiscal issue findings are robust, i.e., a reduction in government expenditure mandated by the IMF has adverse distributional consequences in SSA. For poverty-reduction measures, the number of these conditions is positive and significant in Sub-Saharan Africa. Recall that this is most likely a selection effect, though. More importantly, the interaction with government expenditure is also negative, indicating that these policies reduce income inequality. However, we again fail to reject the null hypothesis for this interaction term. For the external sector, the results are also consistent with our finding of the net Gini coefficient: IMF arrangements increase income inequality in both regions. Finally, the results of financial sector conditionality are stronger considering the Gini of market income relative to net income. Although the signs and magnitude of the coefficients are similar, a reduction in the inflation rate is now significantly (at 5%) associated with higher income inequality outside Sub-Saharan Africa.

The next robustness checks, reported in detail in Appendix 7.5.2, deal with outliers. We use Cook's distance method to exclude outliers. Cook's d is a measure that combines information of leverage (how far an independent variable deviates from its mean) and residual (difference between observed and predicted value). Excluding these outliers, we again test for the different pathways.

The result of fiscal issues is not sensitive to outliers. A higher number of fiscal issues increases income inequality, and a subsequent reduction of government expenditure due to austerity widens the pay gap. For poverty-reduction measures, the previously discussed results also hold. We still find that, in economies of SSA, the number of these conditions are significantly positive. The interaction with government expenditure is negative, albeit insignificant.

The finding of adverse distributional impact of external sector conditions through FDI for Non-SSA is robust to outliers. However, the effect is now smaller. The *de jure* measure of capital openness in SSA has also decreased in magnitude, and turned insignificant. Nonetheless, it is still positive and suggests therefore that the Fund induces policy reforms in the external sector which distort the income distribution at the expense of the poor. For the financial sector, the negative association of inflation with inequality holds, too. However, these variables are significant for neither region.

Next, we consider an implementation-discounted binding condition count (dBA2), see Appendix 7.5.3. Again, the results of fiscal issues are robust to the choice of the condition count in terms of magnitude and sign. The coefficients of interest are now insignificant, though. Further, we find still evidence of what we identified as a selection effect in SSA, i.e., the number of poverty-reduction measures is associated with increasing income inequality. In addition, and like our robustness check with the Gini of market income, the interaction term of these measures with government expenditure is negative and significant in that region. The evidence of the income-widening impact of IMF arrangements through

FDI in Non-SSA, and the Chinn-Ito Index of financial openness in SSA is even stronger. In addition, we obtain similar estimates for financial sector conditions, for which we fail to reject the null hypothesis at standard thresholds of statistical significance.

As a further step, we extend our control variables in Appendix 7.5.4 to include the rate of unemployment, a measure for human capital, and the urban population share. Unemployment reflects another dimension of fiscal policy and the latter two variables signify the level of development, potentially with implications for income (re)distribution. The inclusion of further explanatory variables reduces the number of observations, which impedes precise estimation. In addition, we would expect standard errors to increase due to higher multicollinearity, thereby weakening the level of significance. The results of fiscal issues remain largely unchanged by the additional variables. The pathway that poverty-reduction conditions reduce income inequality in case of higher government expenditure in Sub-Saharan Africa is robust. Surprisingly, we find that the interaction of poverty-reduction measures with government expenditure outside Sub-Saharan Africa is now positive. However, the effect is only significant at 10%. For the external sector, the coefficients turn insignificant. Nonetheless, their sign and magnitude are consistent with the findings reported earlier. Finally, the results for the mechanism of the financial sector hold. In particular, the coefficients are comparable in magnitude and sign, and in Non-SSA, the interaction of financial sector condition with the inflation rate is negative and now significant at 1%. Thus, this analysis indicates again that individuals at the top of the income distribution reap the benefits of a reduction in the inflation rate.

6 Discussion and Conclusions

In many regions of the world, within-country income inequality has increased over the past three decades. This study has shown that part of this increase may be attributed to IMF programmes. Disaggregating conditions of an IMF arrangement by policy area enables a detailed assessment of the components of structural adjustment programmes. While we show that fiscal issues—austerity measures restricting government expenditure—have adverse distributional consequences, poverty-reduction measures have an inequality-narrowing effect. This is true for economies in Sub-Saharan Africa. In addition, we find that conditions of the external sector lead to higher income inequality in all regions considered. This impact primarily works through adverse effects of financial openness, but there is also evidence that trade volume and income inequality are positively related to income inequality outside Sub-Saharan Africa. Turning our attention to the financial sector, the models indicate that a reduction in inflation, a common target of IMF programmes, widens the pay gap. This is most likely due to inequality in access to financial services. Thus, stabilising effects of the IMF serve the rich in this context. However, this latter finding is only modestly robust.

Before discussing the policy implication of these findings, we note three limitations of our work. First, while we employ Heckman's two-step method to control for non-random selection into IMF programmes, we do not correct for unobservable variables driving selection into conditionality (i.e., the specific content of an IMF programme, such as the policy areas covered). The exogenous instrument we use in the selection equation is an example of 'synthetic instrumentation' (using compound instruments). This identification strategy, employed in aid effectiveness research (e.g., Dreher & Langlotz, 2015; Nunn & Qian, 2014) and by Lang (2016), promises to solve this issue. Second, the list of mechanisms we identified and tested is not exhaustive. However, the pathways described are homogenous insofar as the Fund's structural adjustment programmes in these areas translate into changes of income inequality within one year. This is not to say that the effects disappear in the long run, but their effects

are tangible already soon after implementation of the structural adjustment reforms. Third, data limitations have restricted a more comprehensive analysis: The observations on the Gini coefficients confined our sample to certain countries. In addition, the number of conditions of a specific policy area has not allowed to test the mechanisms in different sub-periods.

What do our findings suggest for policy? The fact that lower government expenditure following fiscal issues conditionality widens the pay gap supports evidence that austerity is harmful. In addition to lower economic growth or higher unemployment, this work has shown another negative consequence of restrictions on government spending. In light of these risks, both the Fund and borrowing countries need to fully understand the rationale behind these fiscal consolidation measures. Further, we have shown that poverty-reduction measures have an income inequality-narrowing effect. Thus, it is disappointing to discover that only 77 of these binding conditions have been prescribed during the period 1980-2014 (for countries where an estimate of the Gini coefficient was available). The efforts of the Fund with regard to poverty-reduction are laudable, but, at present, amount to little more than a drop in the ocean.

Our evidence of conditions in the external sector justify concerns and criticisms targeted at unfettered liberalisation of trade and capital. These results are in line with the existing literature warning of potentially adverse effects of foreign direct investment. These gains for developing countries appear to increase demand for skilled labour and tilt domestic policy discourse towards the interests of the international financial community. The research has also demonstrated that financial sector conditionality—while aimed at stabilisation, increasing the efficiency of monetary policy, and improving the independence of central banks—has potentially adverse distributional consequences. This is due to unequal access to financial services in developing countries. Thus, IMF arrangements should consider the domestic features of a borrowing country in more detail. In view of the different findings by region, this is paramount. Announcing the streamlining of conditions and increasing local ownership has again been a step in the right direction, yet, the new rhetoric and reforms may reflect an organisational window-dressing, instead of fundamental changes to the Fund's operations (Kentikelenis, et al., 2016).

The contribution of this paper is therefore twofold. Firstly, the findings enhance our understanding of IMF programmes and their impact on income inequality. Taken together, these results suggest that IFIs and their structural adjustment programmes have tangible effects on income inequality. However, we also show that it is insufficient to study the aggregate of these policies because many different, potentially countervailing, forces are at play. Moreover, the impact of the policies prescribed differs substantially by the region considered. Secondly, we use multiple imputation methods to account for the uncertainty of Gini coefficient estimates from the Standardised World Income Inequality Database.

In terms of methodology, future research should employ more sophisticated models which control for unobservable variables into specific components of structural adjustment programmes. Closely related to this, more work needs to be done on the determinants and selection of the scope of conditionality. In terms of substantive work, additional mechanisms should be tested in full detail. Case studies can complement this quantitative evidence and improve our understanding of the causes on income inequality further. Once we have a good knowledge of the determinants of income inequality, we can truly address what is one of the most pressing challenges of our time.

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Figure 1: Income Inequality Over Time, by Region

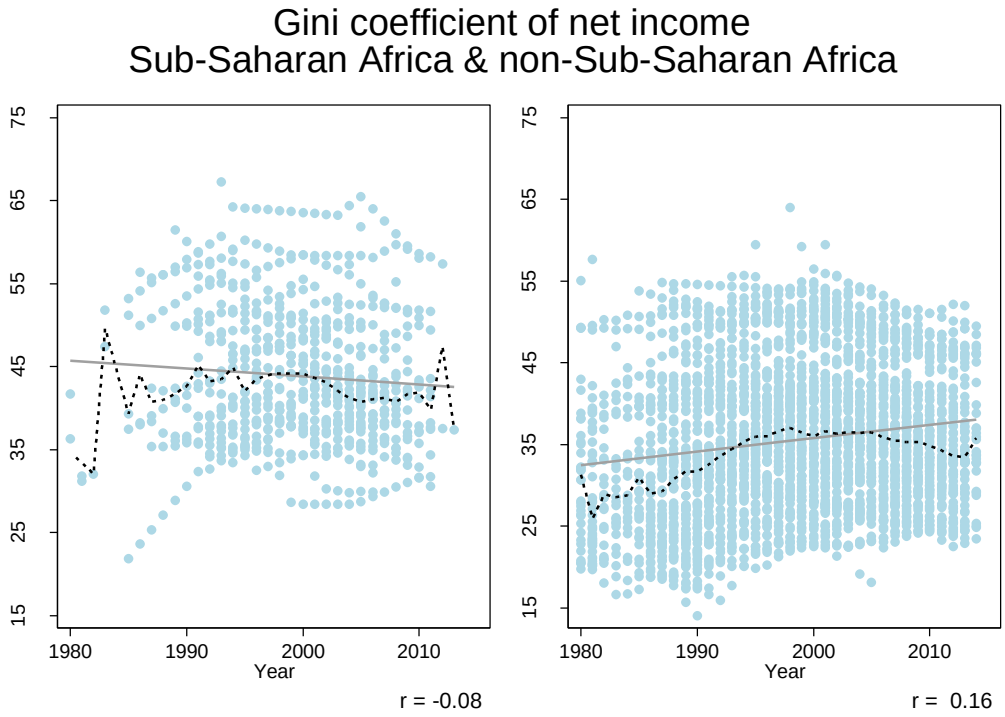

Table 1: Baseline Model

Dependent Variable	Gini of net income					
Model	1		2		3	
Sample	All		Non-SSA		SSA	
L. IMF programme	1.18125*	[0.64182]	0.41765	[0.45182]	3.60041	[2.27274]
L. GDP per cap (ln)	1.58331	[2.12281]	0.66536	[1.42532]	-0.23279	[6.34188]
L. Trade	0.00669	[0.01054]	0.00397	[0.0098]	0.0339	[0.03895]
L. FDI	0.00186	[0.0126]	-0.00146	[0.01034]	-0.00183	[0.09193]
L. Kaopen	0.83205	[0.94678]	0.38507	[0.69962]	5.62586*	[2.95225]
L. Inflation	0.00071**	[0.00035]	0.00046	[0.00031]	0.01845	[0.01889]
L. Govt expenditure	-0.00483	[0.06635]	-0.0246	[0.07295]	0.19429	[0.15854]
L. Life expectancy	0.07096	[0.10798]	-0.21736	[0.20608]	0.37492***	[0.11656]
L. Dependency ratio	0.11254	[0.1508]	0.26195**	[0.10349]	-1.41838**	[0.66355]
L. Govt orientation	-0.21349	[0.13436]	-0.32874***	[0.10288]	0.79959	[0.57651]
L. Democracy Index	-0.376	[0.3046]	0.22105	[0.14174]	-1.45233***	[0.4473]
Inverse Mills ratio	-0.58566**	[0.29312]	-0.20267	[0.21116]	-1.88879*	[1.08996]
Constant	16.16127	[16.41872]	32.66348	[20.42213]	86.56729**	[38.86374]
R2	0.084		0.138		0.499	
N	2319		1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

Table 2: Number and Scope of Conditionality

Dependent Variable	Gini of net income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.11028	[0.52794]	1.9133	[1.42689]
L. No. Conditions	0.03048**	[0.01491]	0.02375	[0.03497]
L. Scope	-0.1429*	[0.08142]	-0.19259	[0.19787]
L. GDP per cap (ln)	0.64764	[1.382]	0.11288	[6.33599]
L. Trade	0.00338	[0.00978]	0.03837	[0.04021]
L. FDI	-0.00127	[0.01028]	0.01313	[0.09389]
L. Kaopen	0.35534	[0.69852]	4.81655*	[2.81348]
L. Inflation	0.00046	[0.00031]	0.01483	[0.01581]
L. Govt expenditure	-0.02085	[0.07327]	0.17835	[0.15477]
L. Life expectancy	-0.23459	[0.20529]	0.386***	[0.12495]
L. Dependency ratio	0.26137**	[0.1034]	-1.4825**	[0.65667]
L. Govt orientation	-0.34095***	[0.10277]	0.7661	[0.55173]
L. Democracy Index	0.22133	[0.14206]	-1.39973***	[0.43322]
Inverse Mills ratio	0.15339	[0.28375]	-0.96749	[0.72825]
Constant	34.18436*	[20.33285]	87.70721**	[38.21008]
R2	0.143		0.489	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

Table 3: Fiscal Issues

Dependent Variable	Gini of net income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.0996	[0.52654]	1.93325	[1.50157]
L. GDP per cap (ln)	0.61655	[1.38954]	0.03081	[6.21185]
L. Trade	0.00299	[0.00987]	0.03966	[0.03758]
L. FDI	-0.00159	[0.01031]	-0.02152	[0.09615]
L. Kaopen	0.39198	[0.69626]	4.53608*	[2.63563]
L. Inflation	0.00049	[0.00031]	0.01364	[0.01549]
L. Govt expenditure	-0.0139	[0.07432]	0.16214	[0.15712]
L. Life expectancy	-0.2312	[0.20514]	0.37893***	[0.12191]
L. Dependency ratio	0.25946**	[0.10326]	-1.48733**	[0.65354]
L. Govt orientation	-0.34668***	[0.10324]	0.84576	[0.53804]
L. Democracy Index	0.22072	[0.141]	-1.43292***	[0.43901]
Inverse Mills ratio	0.12184	[0.28113]	-0.99184	[0.76633]
L. No. Conditions FP	0.01034	[0.09409]	0.75793*	[0.3738]
L. No Conditions Non-FP	0.04192	[0.03464]	-0.09829	[0.08792]
L. Scope	-0.13795	[0.08329]	-0.19569	[0.19896]
L. Govt exp. x FP	-0.00156	[0.00629]	-0.04516**	[0.02059]
L. Govt exp. x Non-FP	-0.00031	[0.00218]	0.00718	[0.00604]
Constant	34.20074*	[20.33122]	89.34631**	[37.39669]
R2	0.144		0.501	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

Table 4: Poverty Reduction

Dependent Variable	Gini of net income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.12045	[0.53698]	1.74671	[1.32537]
L. GDP per cap (ln)	0.63149	[1.38199]	0.20036	[5.888]
L. Trade	0.00334	[0.00979]	0.03803	[0.03946]
L. FDI	-0.00148	[0.01023]	0.03198	[0.0976]
L. Kaopen	0.35314	[0.69696]	5.05763*	[2.72397]
L. Inflation	0.00046	[0.00031]	0.00904	[0.01381]
L. Govt expenditure	-0.00952	[0.0744]	0.14441	[0.15613]
L. Life expectancy	-0.23412	[0.20597]	0.25175**	[0.12012]
L. Dependency ratio	0.26133**	[0.10332]	-1.27775*	[0.66494]
L. Govt orientation	-0.33942***	[0.10251]	0.5854	[0.52082]
L. Democracy Index	0.22233	[0.14132]	-1.2499***	[0.40538]
Inverse Mills ratio	0.14085	[0.28918]	-1.04373	[0.76552]
L. No. Conditions POV	-0.15777	[0.84857]	4.06685***	[1.30968]
L. No Conditions Non-POV	0.04108*	[0.02416]	-0.02829	[0.05249]
L. Scope	-0.13948*	[0.07973]	-0.09021	[0.18761]
L. Govt exp. x POV	-0.00839	[0.07399]	-0.14382	[0.09999]
L. Govt exp. x Non-POV	-0.00075	[0.00133]	0.00103	[0.00399]
Constant	34.11056*	[20.36374]	85.8661**	[39.63586]
R2	0.143		0.526	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

Table 5: External Sector

Dependent Variable	Gini of net income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.08252	[0.48157]	2.04479	[1.57082]
L. GDP per cap (ln)	0.89498	[1.32851]	1.07659	[5.57277]
L. Trade	0.00505	[0.00985]	0.07482	[0.04531]
L. FDI	-0.00273	[0.00865]	-0.08133	[0.0878]
L. Kaopen	0.47839	[0.70695]	5.258*	[2.89037]
L. Inflation	0.0005	[0.0003]	0.01884	[0.01549]
L. Govt expenditure	-0.00407	[0.06831]	0.1883	[0.14199]
L. Life expectancy	-0.24106	[0.20408]	0.33951***	[0.11775]
L. Dependency ratio	0.26213**	[0.10399]	-1.36615**	[0.64056]
L. Govt orientation	-0.33626***	[0.10099]	0.75324	[0.54966]
L. Democracy Index	0.21916	[0.13586]	-1.36903***	[0.39925]
Inverse Mills ratio	0.00841	[0.26231]	-1.27037	[0.83846]
L. No. Conditions EXT	-0.22418*	[0.13333]	-0.9318	[0.56932]
L. No Conditions Non-EXT	0.09011**	[0.0395]	0.24861**	[0.12023]
L. Scope	-0.14028*	[0.07926]	-0.17564	[0.21754]
L. Trade x EXT	0.00271	[0.00191]	0.00324	[0.00831]
L. Trade x Non-EXT	-0.00067*	[0.0004]	-0.00217	[0.00145]
L. FDI x EXT	0.05998**	[0.02475]	0.01817	[0.05592]
L. FDI x Non-EXT	-0.00778*	[0.00399]	0.00506	[0.00962]
L. Kaopen x EXT	-0.24708	[0.25321]	2.35188**	[1.11729]
L. Kaopen x Non-EXT	0.01693	[0.04417]	-0.36256**	[0.13816]
Constant	32.09112	[19.81243]	75.79254**	[32.85367]
R2	0.18		0.516	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

Table 6: Financial Sector

Dependent Variable	Gini of net income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.09219	[0.51565]	2.00127	[1.54189]
L. GDP per cap (ln)	0.63156	[1.37795]	-0.25439	[6.10711]
L. Trade	0.00333	[0.00983]	0.03617	[0.03874]
L. FDI	-0.00138	[0.01032]	0.01779	[0.09046]
L. Kaopen	0.3507	[0.69776]	4.68116	[2.92276]
L. Inflation	0.00052	[0.00035]	0.03264	[0.02469]
L. Govt expenditure	-0.02485	[0.07477]	0.19695	[0.15302]
L. Life expectancy	-0.23416	[0.20713]	0.37476***	[0.12406]
L. Dependency ratio	0.26004**	[0.10335]	-1.4801**	[0.66555]
L. Govt orientation	-0.34115***	[0.10393]	0.66195	[0.56467]
L. Democracy Index	0.22023	[0.14209]	-1.3591***	[0.40598]
Inverse Mills ratio	0.1325	[0.27453]	-1.1839	[0.86215]
L. No. Conditions FIN	0.03349	[0.03421]	0.0822	[0.18149]
L. No Conditions Non-FIN	0.03051	[0.01896]	0.0369	[0.07469]
L. Scope	-0.14482*	[0.08175]	-0.1956	[0.19841]
L. Inflation x FIN	-0.00013	[0.00008]	-0.00407	[0.00569]
L. Inflation x Non-FIN	0.00001	[0.00003]	-0.00079	[0.00276]
Constant	34.40829*	[20.25458]	90.02204**	[37.94579]
R2	0.143		0.5	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7 Appendix

7.1 The Standardised World Income Inequality Database

7.1.1 Characteristics, Advantages, and Limitations of the Data on Income Inequality

Any quantitative study of income inequality across countries and time requires comparable data with broad coverage. The Standardised World Income Inequality Database (SWIID) has this as its underlying objective (Solt, 2016, p. 1267). The dataset covers a maximum of 174 countries and 4,631 country-years of the Gini coefficient of net income. Additionally, it includes three series of estimates—Gini coefficient of market income, absolute redistribution, and relative redistribution. For the purposes of our study, we use the Gini coefficients of net and market income.

In terms of coverage, the SWIID advances substantially on previous data collections since Solt (2016) exploits systematic relationships among different operationalisations of Gini coefficients. Unlike other databases (e.g., Deininger & Squire, 1998; Milanovic, 2014), he does not employ a fixed adjustment. Such constant ratios preclude the possibility that the relationship between different inequality measures changes over time. Put differently, one imposes the restriction that the Gini of net income is always and everywhere the same fraction of the Gini coefficient of market income, or that the ratio between income inequality based on consumption and expenditure measures is constant. Of course, this is not plausible, because income inequality is a function of government policies, the tax code, consumption patterns, and other factors. Instead, Solt classifies the data in 13 different categories, drawing from different sources. The SWIID is based on the estimation of different ratios among these measures. In particular, they are predicted as a function of "1) country-decade, (2) country, (3) region, and (4) advanced or developing world" (Solt, 2016, p. 1272). To obtain imputed values, Solt utilises different regression techniques. Subsequent predictions are made by way of comparison to the Luxembourg Income Study (LIS), known as the gold standard due to its uniform definitions and harmonised data on income inequality. Since stark year-to-year variations in the income distribution are likely to reflect measurement error (except for certain periods and countries, e.g., the transition years in former Soviet Union countries), Solt smoothens the series by moving-average algorithms. Finally, the variables are re-generated through Monte Carlo simulations. Thus, the database ultimately includes 100 observations per country-year.

Importantly, Solt (2016) assesses the quality of the database. With the release of additional data by the LIS and other sources, he compares estimates from earlier versions of the SWIID with the newly-available data. These results are satisfying in terms of various statistical criteria. Given its advantages of comparable data and broad coverage, the SWIID has been increasingly used in the literature (e.g., IMF, 2014; Lang, 2016; Oberdabernig, 2013).

However, an external assessment of the SWIID raises some concerns (Jenkins, 2015). In particular, Jenkins questions some of the underlying assumptions about multiple imputation (i.e., the plausibility of the four criteria mentioned above) and asks for more transparency. Furthermore, Solt removes data prior to 1960 due to low quality. Yet, Jenkins believes this is insufficient, because observations for developing countries may still be of low quality post-1960. In our paper, we use data from 1980 onwards, making it thus more reliable. On top of that, Jenkins' evaluation referred to an earlier version of the SWIID from September 2013. Since then, it has been updated (we use the current version 5.1, July 2016) and additional data for the replication of the SWIID are available online.

In sum, the SWIID offers an innovative solution to the trade-off between country coverage and data quality. Thus, it is not surprising that researchers have used the data increasingly in empirical studies.

For the purposes of this analysis, studying a panel of countries from 1980-2014, we are mostly interested in within-country changes over time. The levels of income inequality are therefore not *per se* relevant for the estimation. In addition, we employ multiple imputation techniques, following recommendations by both Solt and Jenkins in their papers. This adjustment is explained next.

7.1.2 Multiple Imputation

The Standard World Income Inequality Database (SWIID) incorporates Gini coefficients of different sources and definitions. Solt obtains estimates for Gini coefficients (net and market income) by employing different algorithms to exploit systematic relationship among Gini coefficients. Once there are estimates, he re-generates the variable with Monte Carlo simulations and averages these values. Thus, the database includes 100 estimates per country-year. In order to account for the uncertainty, one needs to use multiple imputations.

In this procedure, we run the regressions for all Gini estimates separately and average the coefficients over the 100 observations. The standard errors are adjusted following Rubin (1987). He shows that the variance is as follows:

$$(estimated\ total\ variance) = (estimated\ average\ within\ variance) + (1 + m^{-1}) \times (estimated\ between\ variance)$$

The estimated average within-variance is the mean of the variance of a coefficient across all 100 regressions. The adjustment consists of $(1 + m^{-1})$, a correction term due to the finite number of imputations and the between-imputation variance of the estimate. The latter is the total variation in the coefficient (i.e., the sum of the variance of coefficient i to the mean of all coefficients).

The measure of the goodness of the fit, R^2, needs to be corrected, too. We follow Harel (2009). Accordingly, we take the square root of each R^2 to obtain a correlation coefficient, r, and use Fisher's z-transformation:

$$z = \frac{1}{2} log_e \frac{1 + r}{1 - r}$$

Following Rubin (1987) again, we average all z-values and inverse transform for the multiple imputation-corrected r:

$$r = \frac{e^{2z} - 1}{e^{2z} + 1}$$

Finally, we obtain R^2 by squaring the correlation coefficient r.

Unless we use multiple imputation or if we fail to adjust the estimates correctly, we underestimate the standard errors and report significant results overly optimistic. This bias is most severe for countries with low data quality, i.e., mostly developing countries. For these countries, the estimates of the Gini coefficients are less precise and using multiple imputation estimation is paramount. We take this into account.

7.2 Policy Areas

Policy Area Description
External debt issues [DEB] Debt management and external arrears.
Financial sector, monetary policy, and Central Bank issues [FIN] Financial institution regulation, financial SOE privatization, treasury bills, interest rates, Central Bank regulation, money supply, and domestic credit.
Fiscal issues [FP] Expenditure administration, fiscal transparency, audits, budget preparation, domestic arrears, and fiscal balance.
External sector (trade and exchange system) [EXT] Trade liberalization, exchange rate policy, capital account liberalization, foreign direct investment, and foreign reserves.
Revenues and tax issues [RTP] Customs administration, tax policy, tax administration, and audits of private enterprises.
SOE reform and pricing [SOE] SOE restructuring, subsidies, price liberalization, audits, marketing boards, and corporatization and rationalization.
Labor issues (public and private sector) [LAB] Wage and employment limits, pensions, and social security institutions.
SOE privatization [PRI] Non-financial SOE privatization (incl. liquidation and bankruptcy proceedings for SOEs).
Social policy (restrictive or neutral) [SP] Restrictive or neutral policy on health, housing, and education, price increases for food, water, public transport, or other basic need goods.
Redistributive policies [POV] Poverty Reduction Strategy Paper development, increases in social sector spending, and implementation of social safety nets.
Institutional reforms [INS] Judicial system reforms, anti-corruption measures, enhancing competition, private sector development, devolution, and sectoral policies.
Land and environment [ENV] Land registries, granting of property rights, environmental regulations and access to commons.
Residual category [OTH] National accounts framework, balance of payments reporting, and household surveys.

Kentikelenis, et al. (2016) discuss the evolution of conditionality in more detail and introduce the dataset used in this study. Our definition of the scope of conditionality is derived from the policy areas above.

7.3 Data

7.3.1 List of Variables

Variable name	Definition	Source
Dependent variables		
Gini coefficient of net income	Estimate of Gini index of inequality in equivalized (square root scale) household disposable (post-tax, post-transfer) income, using Luxembourg Income Study data as the standard	Solt, 2016
Gini coefficient of gross income	Estimate of Gini index of inequality in equivalized (square root scale) household market (pre-tax, pre-transfer) income, using Luxembourg Income Study data as the standard	Solt, 2016
Covariates for outcome equation		
IMF programme	Binary indicator variable for whether an IMF programme has been active for at least five months in a given year	Kentikelenis, et al., 2016
All conditions (BA2)	Number of binding conditions in a given year; a condition is binding if it is either a prior action, a structural performance criterion, or a quantitative performance criterion	Kentikelenis, et al., 2016
Scope of conditions	Number of policy areas covered by an IMF programme in a given year, based on binding condition count	Authors' calculation using Kentikelenis, et al., 2016
Fiscal policy issues [FP]	Number of binding conditions on fiscal policy issues; includes measures related to expenditure administration, fiscal transparency, and fiscal balance, in a given year	Kentikelenis, et al., 2016
Poverty-reduction measures [POV]	Number of binding conditions on poverty reduction; includes measures related to Poverty Reduction Strategy Paper development, increases in social sector spending (health, education, and housing), and implementation of social safety nets, in a given year	Kentikelenis, et al., 2016
External sector conditions [EXT]	Number of binding conditions in the external sector; includes targets on net international reserves, gross foreign reserves, and similar; it also includes conditions on the foreign exchange rate regime, exchange rate policies, capital account liberalization, and trade-related issues, in a given year	Kentikelenis, et al., 2016
Financial sector conditions [FIN]	Number of binding conditions on the financial sector; includes conditions on financial institutions (legal reforms, regulation, and supervision), treasury bill issuance and auctions, government securities, monetary policy, and central bank reform, in a given year	Kentikelenis, et al., 2016
All conditions (dBA2)	Number of binding conditions in a given year, discounted for programme interruptions	Kentikelenis, et al., 2016

Scope of conditions (dBA2)	Number of policy areas covered by an IMF programme in a given year, based on implementation-discounted binding condition count	Authors' calculation using Kentikelenis, et al., 2016
Fiscal policy issues [FP] (dBA2)	Number of implementation-discounted binding conditions on fiscal policy issues; includes measures related to expenditure administration, fiscal transparency, and fiscal balance, in a given year	Kentikelenis, et al., 2016
Poverty-reduction measures [POV] (dBA2)	Number of implementation-discounted binding conditions on poverty reduction; includes measures related to Poverty Reduction Strategy Paper development, increases in social sector spending (health, education, and housing), and implementation of social safety nets, in a given year	Kentikelenis, et al., 2016
External sector conditions [EXT] (dBA2)	Number of implementation-discounted binding conditions in the external sector; includes targets on net international reserves, gross foreign reserves, and similar; it also includes conditions on the foreign exchange rate regime, exchange rate policies, capital account liberalization, and trade-related issues, in a given year	Kentikelenis, et al., 2016
Financial sector conditions [FIN] (dBA2)	Number of implementation-discounted binding conditions on the financial sector; includes conditions on financial institutions (legal reforms, regulation, and supervision), treasury bill issuance and auctions, government securities, monetary policy, and central bank reform, in a given year	Kentikelenis, et al., 2016
GDP per capita (ln)	ln GDP per capita (constant 2005 US$) [NY.GDP.PCAP.KD]	WDI, Feb. 2016
Trade	Trade (% of GDP) [NE.TRD.GNFS.ZS]	WDI, Feb. 2016
Financial openness	Foreign direct investment, net inflows (% of GDP) [BX.KLT.DINV.WD.GD.ZS]	WDI, Feb. 2016
Chinn-Ito index	Chinn-Ito Financial Openness Index, normalized to range between zero and one	Chinn & Ito, 2006
Inflation	Inflation, GDP deflator (annual %) [NY.GDP.DEFL.KD.ZG]	WDI, Feb. 2016
Government consumption	General government final consumption expenditure (% of GDP) [NE.CON.GOVT.ZS]	WDI, Feb. 2016
Life expectancy	Life expectancy at birth, total (years) [SP.DYN.LE00.IN], 1 year lagged	WDI, Feb. 2016
Dependency ratio	Sum of Population, ages 0-14 (% of total) [SP.POP.0014.TO.ZS] and Population ages 65 and above (% of total) [SP.POP.65UP.TO.ZS]	Authors' calculation using WDI, Feb. 2016
Largest government party orientation	The variable captures whether the party is right, left, or center oriented: (1) Right; (2) Center (2); (3) Left. Right: for parties that are defined as conservative, Christian democratic, or right- wing; Left: for parties that are defined as communist, socialist, social democratic, or left-wing; Center: for parties that are defined as centrist or when party position can best be described as centrist (e.g. the party advocates strengthening private enterprise in a social-liberal context); not described as centrist if competing factions “average out” to a centrist position (e.g.	Database of Political Institutions 2015 [2016]

	a party of “right-wing Muslims and Beijing-oriented Marxists”). The primary source of these codings is the party’s name.	
Democracy	Index of Level of Democracy (Freedom House/Imputed Polity), ranges from 0 (least democratic) to 10 (most democratic)	Quality of Governance Database, Jan. 2016
Unemployment	Unemployment, total (% of total labor force) [SL.UEM.TOTL.ZS]	WDI, Feb. 2016
Human capital index	Human capital index, based on years of schooling and assumed returns	Quality of Governance Database, Jan. 2016
Urban population	Urban population (% of total) [SP.URB.TOTL.IN.ZS]	WDI, Feb. 2016
Covariates for selection stage		
GDP growth	GDP growth (annual %) [NY.GDP.MKTP.KD.ZG]	WDI, Feb. 2016
Foreign exchange reserves	Total reserves in months of imports [FI.RES.TOTL.MO]	WDI, Feb. 2016
Current account	Current account balance (% of GDP)	WEO, Apr. 2016
Legislative elections	Binary indicator variable for whether a legislative election was held in a given year	Database of Political Institutions 2015 [2016]
Executive elections	Binary indicator variable for whether a executive election was held in a given year	Database of Political Institutions 2015 [2016]
Countries under programme	Number of countries participating in an IMF programme (for at least five months in a specific year)	Authors' calculation using Kentikelenis, et al., 2016
Country-specific probability	Number of years with an IMF programme in terms of the sample period	Authors' calculation using Kentikelenis, et al., 2016
Exogenous interaction	Interaction of 'Countries under programme' with 'Country-specific probability'	Authors' calculation using Kentikelenis, et al., 2016

7.3.2 Summary Statistics

Variable name	N	Mean	Sd	Min	Max
Dependent variables					
Gini coefficient of net income	3,560	37.11	9.38	14.06	67.21
Gini coefficient of gross income	3,560	45.62	7.85	21.97	76.89
Covariates for outcome equation					
IMF Programme	3,420	0.32	0.47	0	1
All conditions (BA2)	3,420	8.21	14.69	0	124
Scope of conditions	3,420	1.46	2.42	0	11
Fiscal policy issues [FP]	3,420	1.19	2.82	0	25
Poverty-reduction measures [POV]	3,420	0.02	0.28	0	8
External sector conditions [EXT]	3,420	0.96	2.02	0	24
Financial sector conditions [FIN]	3,420	2.08	3.99	0	36
All conditions (dBA2)	2,942	7.55	13.72	0	93
Scope of conditions (dBA2)	2,942	1.43	2.35	0	11
Fiscal policy issues [FP] (dBA2)	2,942	1.04	2.51	0	25
Poverty-reduction measures [POV] (dBA2)	2,942	0.02	0.28	0	6
External sector conditions [EXT] (dBA2)	2,942	0.89	1.95	0	24
Financial sector conditions [FIN] (dBA2)	2,942	1.93	3.69	0	28
GDP per capita (ln)	3,387	8.15	1.62	4.84	11.38
Trade	3,353	82.03	54.49	11.55	447.06
Financial openness	3,223	3.72	7.47	-58.98	173.45
Chinn-Ito index	3,182	0.52	0.37	0	1
Inflation	3,360	42.48	371.95	-29.17	15444.38
Government consumption	3,302	15.70	5.58	1.38	47.19
Life expectancy	3,524	68.42	9.88	27.08	83.42
Dependency ratio	3,533	38.24	6.52	24.82	54.08
Largest government party orientation	3,127	1.51	1.21	0	3
Democracy	3,308	6.83	3.01	0.25	10
Unemployment	2,877	9.09	6.27	0.10	39.30
Human capital index	2,730	2.45	0.57	1.12	3.62
Urban population	3,536	56.52	22.96	5.06	100.00
Covariates for selection stage					
GDP growth	3,367	3.56	5.35	-50.25	88.96
Foreign exchange reserves	2,871	3.95	3.17	0.01	27.63
Current account	3,308	-2.66	7.50	-84.11	49.98
Legislative elections	3,312	0.24	0.43	0	1
Executive elections	3,313	0.12	0.32	0	1
Countries under programme	3,560	51.96	9.98	31.00	65.00
Country-specific probability	3,560	0.28	0.25	0	0.94
Exogenous interaction	3,561	14.72	13.90	0	61.29

7.4 Non-Random Sample Selection

A country's participation in an IMF programme in a given year is not randomly assigned but instead a decision by a country's executive. This decision to ask the IMF for financial assistance is a function of a number of economic and political variables. For instance, countries may turn to the Fund due to financial turmoil. In order to account for this non-random sample selection—participating countries differ systematically from non-participating states along a range of factors—we need to account for these variables explaining programme participation in our model. Unless we do so, any effect we attribute to IMF programmes may be partly explained by unobserved variables, e.g., political will. To address the issue of selection bias, we adopt a version of Heckman's (1979) two-step method.

7.4.1 Heckman's Two-step Method

Following Vreeland's discussion (2006, pp. 79-81) of non-random sample selection, we explain the intuition behind Heckman's two-step method in more detail. Consider again political will as an unobserved variable relevant for the investigation of IMF programmes and income inequality. Since the variable is unobserved, it is included in the error term. As a consequence, we sometimes overestimate, sometimes underestimate the true parameter of the IMF. If our data covers only countries with high political will, this may distort our results further. In this case, we cannot generalise the results to the whole population, i.e., all member states of the IMF. Technically speaking, the standard assumption for ordinary least squares regression analysis that the error term is distributed independently of the regressors is violated.

To overcome the problem of a non-random sample selection, we somehow need to account for these unobserved and time-variant variables. Since the mathematical estimation of any statistical model accounts for error, the problem can be broken down into two components. First, unobserved variables determine sample selection. Put differently, variables such as political will determine the likelihood of an IMF programme. Second, these unobserved variables could also affect our outcome variable. That is, political will may lead to systematically different outcomes of income inequality. Thus, we have effectively two equations whose error term includes the same unobserved time-varying variables.

Heckman's two-step method utilises this fact. In particular, we can estimate these two separate equations. First, we predict the probability of IMF programme participation. In this case, we choose for our selection equation explanatory variables that are indicative of IMF arrangements (e.g., past programme participation, but see details further down). Recall that this model controls explicitly for error. Second, we estimate the outcome equation, i.e., the structural relationship of macroeconomic variables and income inequality. Thus, there are two models, each with its own error. These may not be correlated, meaning that none of the factors not accounted for in either model are relevant for the other equation. They are independent. Yet, suppose that they are correlated. As we suggested above, political will is likely to be such an example. If this holds, any mistake for the selection will also occur for the same country-year observations in the outcome equation. Thus, factors driving participation affect income inequality. Once this correlation is detected, one can disentangle the effects and determine which portion of change in income inequality is due to unobserved variables driving selection and how much is due to the IMF programme. In short, Heckman's two-step method allows to control for the correlation between the errors in selection and the errors in the outcome equation of income inequality. In the estimation, an additional variable is computed from the two equations. This variable, known as the hazard rate or inverse Mills ratio, is then added as a control in the second stage, reflecting the correlation of errors.

However, the approach also has its critics, as pointed out by Lang (2016): On the one hand, the method has not always been applied appropriately, e.g., wrong estimation (logit instead of probit for the first stage, other than OLS for the second stage) and improper calculation of the inverse Mills ratio (Bushway, et al., 2007). On the other hand, there are concerns of collinearity if the explanatory variables in the selection and outcome equation are the same (Puhani, 2000).[4] These concerns notwithstanding, we use a version of Heckman's two-step method to control for non-random selection in this paper. This seems to be the more reasonable approach given the IMF participation variable is binary. In addition, we draw on recent methodological innovations for our selection equation, which is described next.

7.4.2 Selection Equation

7.4.2.1 Specification

As outlined above, we need to specify a selection equation predicting countries opting into IMF programmes. In order to capture the correlation of unobserved variables with the outcome equation, we want to achieve the best fit for this prediction of IMF programme participation.

For our selection model, estimated with probit, we control for variables which are standard in the literature of IMF evaluations (e.g., see Dreher & Walter, 2010; Kentikelenis, et al., 2015, for selection equations). We control for both economic and political variables, but also use an exogenous instrument. Our explanatory variables are lagged values of programme participation, GDP per capita, GDP growth, foreign exchange reserves, current account balance, an index for democracy, and binary variables for legislative and executive elections. Additionally, we include regional dummies plus all controls from the second stage (see section 3.1 and 3.2). As an exogenous instrument, we interact the number of countries under an IMF programme—reflecting the Fund's budget constraint—with the country-specific fraction of years with a programme in terms of the sample period. The latter is indicative of a country-varying probability of programme participation. In addition, we also include these two variables in levels as controls for the selection.

However, the exclusion condition is only violated if there are unobservable variables conditional on the country-specific probability of an IMF programme that systematically determine income inequality in borrowing countries through their impact on the liquidity constraint of the Fund, after accounting for all other control variables. This is unlikely to be the case. Thus, we believe that our selection equation and the identification strategy using Heckman's two-step method with an exogenous instrument is valid.

7.4.2.2 Estimates

We tested alternative specifications for the selection equation to generate the inverse Mills ratio. This probit model correctly predicts 88.01% cases, and—given this fit—retaining the highest number of observations for the subsequent analysis of income inequality.

[4] For a survey of methods to estimate models with sample selection, see Vella (1998).

Dependent Variable	IMF programme	
Model	Selection equation	
Sample	Full Sample	
L. IMF programme	1.65325***	[0.08237]
L. GDP per capita	-0.33332	[0.90453]
L. GDP growth	-0.03077***	[0.01037]
L. Foreign exchange reserves	-0.07529***	[0.01846]
L. Current account	-0.01252	[0.00782]
L. Democracy index	-0.0171	[0.06378]
L. Legislative election	0.00165	[0.09915]
L. Executive election	-0.04655	[0.12171]
Countries under programme	0.00911	[0.00906]
Country-specific probability	0.86361	[1.10199]
Exogenous interaction	0.02465	[0.0197]
Constant	0.10141	[1.21311]
Pseudo R2	0.536	
N	2319	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.
The regression includes regional dummies and all covariates from the outcome equation, see section 3.1 and 3.2.

7.5 Regressions Robustness Checks

7.5.1 Gini of Market Income as Dependent Variable

7.5.1.1 Fiscal issues

Dependent Variable	Gini of market income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.04591	[0.679]	1.96988	[1.71397]
L. GDP per cap (ln)	0.83421	[1.5916]	0.51017	[6.96126]
L. Trade	0.00555	[0.01242]	0.04359	[0.04285]
L. FDI	-0.00813	[0.01732]	-0.03183	[0.10844]
L. Kaopen	0.68661	[0.89999]	5.99208*	[3.04117]
L. Inflation	0.00041	[0.00036]	0.01564	[0.01793]
L. Govt expenditure	0.05689	[0.07855]	0.20229	[0.18137]
L. Life expectancy	-0.32673	[0.27331]	0.41288***	[0.13676]
L. Dependency ratio	0.45281***	[0.1402]	-1.62951**	[0.75409]
L. Govt orientation	-0.3273**	[0.15252]	0.97268	[0.59438]
L. Democracy Index	0.20079	[0.16504]	-1.62411***	[0.51057]
Inverse Mills ratio	-0.01799	[0.34132]	-1.0531	[0.87014]
L. No. Conditions FP	-0.00535	[0.14545]	0.86758*	[0.44103]
L. No Conditions Non-FP	0.06456	[0.0463]	-0.10812	[0.10333]
L. Scope	-0.09737	[0.098]	-0.22817	[0.23926]
L. Govt exp. x FP	-0.00137	[0.01152]	-0.05114**	[0.02396]
L. Govt exp. x Non-FP	-0.00315	[0.00322]	0.00833	[0.00693]
Constant	36.86848	[25.77848]	97.25624**	[42.88757]
R2	0.17		0.495	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.1.2 Poverty-reduction measures

Dependent Variable	Gini of market income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.02782	[0.68024]	1.75339	[1.53073]
L. GDP per cap (ln)	0.84612	[1.58641]	0.69766	[6.6462]
L. Trade	0.00597	[0.0123]	0.04179	[0.04536]
L. FDI	-0.00791	[0.01726]	0.02838	[0.10929]
L. Kaopen	0.64005	[0.89303]	6.57426**	[3.15584]
L. Inflation	0.00037	[0.00035]	0.01065	[0.01613]
L. Govt expenditure	0.06163	[0.07904]	0.18235	[0.18239]
L. Life expectancy	-0.33143	[0.27443]	0.27338*	[0.13537]
L. Dependency ratio	0.45491***	[0.13972]	-1.39826*	[0.76714]
L. Govt orientation	-0.32132**	[0.15312]	0.68271	[0.58175]
L. Democracy Index	0.20187	[0.16563]	-1.42201***	[0.47546]
Inverse Mills ratio	0.04991	[0.34328]	-1.10177	[0.87386]
L. No. Conditions POV	-0.44094	[1.19073]	4.38352***	[1.57356]
L. No Conditions Non-POV	0.05968*	[0.03154]	-0.02634	[0.06425]
L. Scope	-0.09585	[0.09287]	-0.11195	[0.22567]
L. Govt exp. x POV	0.02309	[0.1028]	-0.15158	[0.11296]
L. Govt exp. x Non-POV	-0.00319*	[0.00189]	0.00133	[0.00461]
Constant	36.91979	[25.80552]	93.35659**	[45.62391]
R2	0.169		0.518	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.1.3 External sector

Dependent Variable	Gini of market income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.3504	[0.67184]	2.05926	[1.78952]
L. GDP per cap (ln)	1.10761	[1.58813]	1.56299	[6.27845]
L. Trade	0.00768	[0.01213]	0.08053	[0.05169]
L. FDI	-0.00925	[0.01527]	-0.09751	[0.09836]
L. Kaopen	0.8122	[0.9558]	6.5824*	[3.35634]
L. Inflation	0.00042	[0.00035]	0.02142	[0.0181]
L. Govt expenditure	0.03189	[0.07793]	0.23485	[0.16523]
L. Life expectancy	-0.33756	[0.27343]	0.37265***	[0.13237]
L. Dependency ratio	0.44275***	[0.14053]	-1.51203**	[0.74093]
L. Govt orientation	-0.32003**	[0.15238]	0.85902	[0.61739]
L. Democracy Index	0.19411	[0.1639]	-1.54917***	[0.46522]
Inverse Mills ratio	-0.166	[0.34242]	-1.35937	[0.95939]
L. No. Conditions EXT	-0.07761	[0.16862]	-1.14493*	[0.66356]
L. No Conditions Non-EXT	0.048	[0.05518]	0.28467*	[0.14276]
L. Scope	-0.10489	[0.09484]	-0.20167	[0.26092]
L. Trade x EXT	0.00278	[0.00295]	0.00416	[0.00963]
L. Trade x Non-EXT	-0.00064	[0.00058]	-0.00235	[0.00171]
L. FDI x EXT	0.06094**	[0.02856]	0.02583	[0.06431]
L. FDI x Non-EXT	-0.00799	[0.00527]	0.00478	[0.01116]
L. Kaopen x EXT	-0.6996*	[0.34527]	2.77082**	[1.2969]
L. Kaopen x Non-EXT	0.07173	[0.05907]	-0.40473**	[0.15691]
Constant	35.91154	[25.95451]	83.60476**	[37.9739]
R2	0.19		0.509	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.1.4 Financial sector

Dependent Variable	Gini of market income			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.07099	[0.6626]	1.97681	[1.78007]
L. GDP per cap (ln)	0.87332	[1.58332]	0.18848	[6.89087]
L. Trade	0.00597	[0.01234]	0.03939	[0.04424]
L. FDI	-0.00753	[0.01725]	0.01283	[0.1025]
L. Kaopen	0.63968	[0.901]	6.09406*	[3.36383]
L. Inflation	0.00029	[0.00036]	0.0367	[0.02822]
L. Govt expenditure	0.0182	[0.08656]	0.24068	[0.17854]
L. Life expectancy	-0.33485	[0.275]	0.40943***	[0.1395]
L. Dependency ratio	0.4539***	[0.14082]	-1.6311**	[0.76921]
L. Govt orientation	-0.32585**	[0.15341]	0.76407	[0.63419]
L. Democracy Index	0.20035	[0.16825]	-1.5398***	[0.4795]
Inverse Mills ratio	0.01561	[0.33672]	-1.19179	[0.98454]
L. No. Conditions FIN	0.04203	[0.05061]	0.12958	[0.20253]
L. No Conditions Non-FIN	0.0035	[0.02956]	0.0364	[0.0878]
L. Scope	-0.09688	[0.09682]	-0.2212	[0.23674]
L. Inflation x FIN	-0.00025**	[0.00012]	-0.00581	[0.00645]
L. Inflation x Non-FIN	0.00008*	[0.00004]	-0.00033	[0.00314]
Constant	37.60506	[25.75937]	98.45989*	[43.67273]
R2	0.166		0.493	
N	1969		350	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.2 Outliers

7.5.2.1 Fiscal issues

Dependent Variable	Gini of net income, excluding outliers			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.23247	[0.53635]	-0.37421	[1.0153]
L. GDP per cap (ln)	-0.16179	[1.31943]	5.8125	[4.35087]
L. Trade	0.00531	[0.01016]	0.03352	[0.03098]
L. FDI	0.01008	[0.01106]	-0.0004	[0.08919]
L. Kaopen	0.37971	[0.69425]	1.62839	[1.77625]
L. Inflation	0.00085	[0.00079]	0.02346	[0.01406]
L. Govt expenditure	-0.04511	[0.08121]	0.1606	[0.15397]
L. Life expectancy	-0.1881	[0.19634]	0.18512	[0.15188]
L. Dependency ratio	0.27254**	[0.10451]	-0.29435	[0.51526]
L. Govt orientation	-0.30215***	[0.10135]	0.48661	[0.46246]
L. Democracy Index	0.265	[0.16134]	-0.55279	[0.38262]
Inverse Mills ratio	0.06535	[0.29432]	0.02547	[0.56101]
L. No. Conditions FP	0.07851	[0.10338]	0.93408**	[0.44731]
L. No Conditions Non-FP	0.02622	[0.0387]	-0.14531*	[0.08182]
L. Scope	-0.15182*	[0.09139]	0.00736	[0.16954]
L. Govt exp. x FP	-0.00569	[0.00708]	-0.07198**	[0.03166]
L. Govt exp. x Non-FP	0.00011	[0.00243]	0.01202*	[0.00667]
Constant	36.40496*	[19.30492]	10.19096	[23.01046]
R2	0.165		0.341	
N	1853		323	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.2.2 Poverty-reduction measures

Dependent Variable	Gini of net income, excluding outliers			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.25133	[0.54362]	-0.36208	[0.99907]
L. GDP per cap (ln)	-0.09478	[1.30058]	6.09678	[4.82487]
L. Trade	0.006	[0.01005]	0.03113	[0.03385]
L. FDI	0.00958	[0.01087]	0.03946	[0.09112]
L. Kaopen	0.40126	[0.68673]	1.90089	[1.85583]
L. Inflation	0.00029	[0.0007]	0.02371	[0.01521]
L. Govt expenditure	-0.04104	[0.08]	0.17793	[0.16379]
L. Life expectancy	-0.21521	[0.19614]	0.05482	[0.17777]
L. Dependency ratio	0.2737***	[0.10381]	0.01425	[0.55444]
L. Govt orientation	-0.29014***	[0.10114]	0.28925	[0.45277]
L. Democracy Index	0.23316	[0.16729]	-0.39599	[0.36196]
Inverse Mills ratio	0.06062	[0.30169]	0.22092	[0.53631]
L. No. Conditions POV	0.78777	[1.64268]	2.48613**	[1.13652]
L. No Conditions Non-POV	0.03985	[0.02688]	-0.04709	[0.04628]
L. Scope	-0.17466**	[0.08763]	0.08111	[0.18958]
L. Govt exp. x POV	-0.14685	[0.1259]	-0.13569	[0.09187]
L. Govt exp. x Non-POV	-0.00102	[0.00146]	0.00349	[0.00455]
Constant	37.86435*	[19.23661]	-0.52493	[28.39485]
R2	0.165		0.308	
N	1859		318	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.2.3 External sector

Dependent Variable	Gini of net income, excluding outliers			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.35118	[0.51164]	-0.13394	[0.93455]
L. GDP per cap (ln)	0.26049	[1.26436]	6.61569	[4.43624]
L. Trade	0.00766	[0.01009]	0.04526	[0.03903]
L. FDI	0.00111	[0.0074]	0.00569	[0.08805]
L. Kaopen	0.53009	[0.70281]	2.52933	[1.88563]
L. Inflation	0.0008	[0.00081]	0.03571**	[0.01415]
L. Govt expenditure	-0.04467	[0.07694]	0.18353	[0.13788]
L. Life expectancy	-0.20842	[0.19947]	0.16002	[0.14593]
L. Dependency ratio	0.27726***	[0.10366]	-0.18908	[0.49828]
L. Govt orientation	-0.27741***	[0.10035]	0.50026	[0.54419]
L. Democracy Index	0.18307	[0.1708]	-0.39868	[0.38325]
Inverse Mills ratio	-0.05132	[0.27521]	-0.33656	[0.52822]
L. No. Conditions EXT	0.09154	[0.27838]	-0.42483	[0.59665]
L. No Conditions Non-EXT	0.04583	[0.04831]	0.08301	[0.12126]
L. Scope	-0.13069	[0.07932]	0.06333	[0.15913]
L. Trade x EXT	0.00209	[0.00268]	0.00382	[0.01029]
L. Trade x Non-EXT	-0.00086*	[0.00047]	-0.00084	[0.00161]
L. FDI x EXT	0.03471**	[0.017]	0.07388	[0.09707]
L. FDI x Non-EXT	0.00003	[0.00211]	-0.00983	[0.01452]
L. Kaopen x EXT	-0.43614*	[0.25655]	1.37461	[1.29857]
L. Kaopen x Non-EXT	0.04113	[0.04199]	-0.18745	[0.13952]
Constant	34.48373*	[19.52446]	-0.63843	[24.31033]
R2	0.19		0.369	
N	1853		316	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.2.4 Financial sector

Dependent Variable	Gini of net income, excluding outliers			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.21794	[0.50643]	-0.01861	[0.98171]
L. GDP per cap (ln)	-0.15051	[1.31404]	5.73867	[4.24393]
L. Trade	0.00579	[0.01009]	0.03618	[0.0334]
L. FDI	0.00952	[0.01091]	0.06268	[0.08242]
L. Kaopen	0.42075	[0.69277]	1.96716	[1.78737]
L. Inflation	0.00114	[0.00072]	0.0392	[0.02617]
L. Govt expenditure	-0.05841	[0.0799]	0.18925	[0.15754]
L. Life expectancy	-0.20246	[0.19628]	0.17598	[0.14448]
L. Dependency ratio	0.26968**	[0.10288]	-0.29524	[0.53838]
L. Govt orientation	-0.28535***	[0.10414]	0.44413	[0.52129]
L. Democracy Index	0.22339	[0.17275]	-0.50256	[0.37224]
Inverse Mills ratio	0.1266	[0.27988]	-0.38511	[0.61043]
L. No. Conditions FIN	0.02597	[0.04198]	0.03878	[0.15754]
L. No Conditions Non-FIN	0.02659	[0.01989]	0.02456	[0.0615]
L. Scope	-0.17435**	[0.0873]	-0.00771	[0.16868]
L. Inflation x FIN	-0.0018	[0.00141]	-0.00187	[0.00611]
L. Inflation x Non-FIN	0.00073	[0.00056]	-0.00118	[0.00219]
Constant	38.15828*	[19.31609]	9.76285	[25.25629]
R2	0.168		0.339	
N	1860		320	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.3 Implementation-discounted Condition Count

7.5.3.1 Fiscal issues

Dependent Variable	Gini of net income, implementation-discounted conditions			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.24707	[0.69363]	1.9388	[1.61892]
L. GDP per cap (ln)	-0.09255	[1.4975]	-1.34267	[6.33779]
L. Trade	0.00253	[0.0103]	0.03602	[0.03562]
L. FDI	0.00724	[0.01309]	0.02394	[0.07918]
L. Kaopen	-0.04379	[0.66742]	4.22902	[2.59496]
L. Inflation	0.0003	[0.0003]	0.01148	[0.01574]
L. Govt expenditure	0.01707	[0.07312]	0.2079	[0.16338]
L. Life expectancy	-0.01326	[0.21997]	0.36529***	[0.12336]
L. Dependency ratio	0.22681*	[0.11818]	-1.41981**	[0.66037]
L. Govt orientation	-0.29647***	[0.09813]	1.12784*	[0.62031]
L. Democracy Index	0.09787	[0.11924]	-1.45982***	[0.42991]
Inverse Mills ratio	0.20983	[0.34658]	-1.04101	[0.80214]
L. No. Conditions FP (dBA2)	-0.03033	[0.1114]	0.55333	[0.40773]
L. No Conditions Non-FP (dBA2)	0.04324	[0.04306]	-0.03291	[0.07831]
L. Scope	-0.0871	[0.09608]	-0.18552	[0.23222]
L. Govt exp. x FP	0.00163	[0.0079]	-0.03137	[0.02056]
L. Govt exp. x Non-FP	-0.00149	[0.00241]	0.00397	[0.00506]
Constant	27.27929	[21.64193]	94.68792**	[39.04305]
R2	0.124		0.511	
N	1662		324	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.3.2 Poverty-reduction measures

Dependent Variable	Gini of net income, implementation-discounted conditions			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.30395	[0.68497]	1.25272	[1.21288]
L. GDP per cap (ln)	-0.08977	[1.49451]	-1.04615	[5.85119]
L. Trade	0.00282	[0.01017]	0.03224	[0.03708]
L. FDI	0.00726	[0.01302]	0.07477	[0.08114]
L. Kaopen	-0.06612	[0.66831]	4.50151*	[2.62251]
L. Inflation	0.00027	[0.0003]	0.00673	[0.01425]
L. Govt expenditure	0.01978	[0.07298]	0.16882	[0.1583]
L. Life expectancy	-0.01528	[0.22077]	0.17497	[0.13377]
L. Dependency ratio	0.22966*	[0.11817]	-1.11418*	[0.65055]
L. Govt orientation	-0.29362***	[0.09743]	0.86385	[0.56956]
L. Democracy Index	0.09917	[0.11919]	-1.25027***	[0.3841]
Inverse Mills ratio	0.25858	[0.34078]	-0.73799	[0.64072]
L. No. Conditions POV (dBA2)	0.12278	[0.81003]	5.34495***	[1.64801]
L. No Conditions Non-POV (dBA2)	0.03472	[0.03541]	-0.00649	[0.04654]
L. Scope	-0.08183	[0.09519]	-0.01549	[0.20941]
L. Govt exp. x POV	-0.03024	[0.06495]	-0.18981*	[0.10527]
L. Govt exp. x Non-POV	-0.0011	[0.00147]	0.0001	[0.00342]
Constant	27.22113	[21.6852]	90.11608**	[41.29928]
R2	0.124		0.557	
N	1662		324	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.3.3 External sector

Dependent Variable	Gini of net income, implementation-discounted conditions			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.02812	[0.54527]	1.63289	[1.63565]
L. GDP per cap (ln)	0.50462	[1.3776]	0.02818	[5.54934]
L. Trade	0.00292	[0.01023]	0.07214*	[0.03735]
L. FDI	0.00079	[0.01311]	-0.05141	[0.08681]
L. Kaopen	0.20715	[0.66745]	4.66801	[2.82848]
L. Inflation	0.00027	[0.00028]	0.01439	[0.01568]
L. Govt expenditure	0.0175	[0.06204]	0.19749	[0.15795]
L. Life expectancy	-0.02646	[0.21459]	0.31398**	[0.12391]
L. Dependency ratio	0.22729*	[0.11833]	-1.31751*	[0.67939]
L. Govt orientation	-0.29415***	[0.09798]	1.03243	[0.60959]
L. Democracy Index	0.08794	[0.11302]	-1.39828***	[0.39818]
Inverse Mills ratio	0.06226	[0.27882]	-0.90791	[0.80724]
L. No. Conditions EXT (dBA2)	-0.35992***	[0.11038]	-0.83335	[0.64844]
L. No Conditions Non-EXT (dBA2)	0.09873**	[0.04181]	0.26121*	[0.13748]
L. Scope	-0.09791	[0.09997]	-0.10594	[0.24432]
L. Trade x EXT	0.00422***	[0.00159]	0.00209	[0.00894]
L. Trade x Non-EXT	-0.00083**	[0.00032]	-0.00227	[0.00157]
L. FDI x EXT	0.06369***	[0.02227]	0.00776	[0.05733]
L. FDI x Non-EXT	-0.00616*	[0.00333]	0.00724	[0.01001]
L. Kaopen x EXT	-0.37389	[0.23913]	2.87015*	[1.62115]
L. Kaopen x Non-EXT	0.00328	[0.0434]	-0.41463**	[0.1834]
Constant	23.10601	[20.50114]	81.54526**	[34.21635]
R2	0.18		0.533	
N	1662		324	

7.5.3.4 Financial sector

Dependent Variable	Gini of net income, implementation-discounted conditions			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	-0.24153	[0.64991]	1.78859	[1.63323]
L. GDP per cap (ln)	-0.05815	[1.48138]	-1.53839	[6.07315]
L. Trade	0.00292	[0.01019]	0.03124	[0.03533]
L. FDI	0.00736	[0.01313]	0.05159	[0.07865]
L. Kaopen	-0.06473	[0.66928]	4.03793	[2.8194]
L. Inflation	0.00034	[0.00036]	0.03363	[0.02563]
L. Govt expenditure	-0.0001	[0.07295]	0.22043	[0.16782]
L. Life expectancy	-0.01793	[0.22071]	0.35532***	[0.12473]
L. Dependency ratio	0.22763*	[0.11845]	-1.40364**	[0.67055]
L. Govt orientation	-0.29656***	[0.09869]	0.953	[0.59541]
L. Democracy Index	0.0944	[0.11915]	-1.3998***	[0.40524]
Inverse Mills ratio	0.23068	[0.3138]	-1.03956	[0.86389]
L. No. Conditions FIN (dBA2)	0.01722	[0.04243]	0.1115	[0.21869]
L. No Conditions Non-FIN (dBA2)	0.02073	[0.02796]	0.0436	[0.09567]
L. Scope	-0.0898	[0.09871]	-0.11532	[0.23908]
L. Inflation x FIN	-0.00002	[0.00007]	-0.00275	[0.00586]
L. Inflation x Non-FIN	-0.00002	[0.00003]	-0.00187	[0.00295]
Constant	27.54183	[21.5802]	95.20684**	[38.86592]
R2	0.123		0.518	
N	1662		324	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.4 Additional Variables

7.5.4.1 Fiscal issues

Dependent Variable	Gini of net income, additional variables			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.55234	[0.55513]	-0.96382	[1.48618]
L. GDP per cap (ln)	2.59946	[1.95675]	7.83027*	[4.19623]
L. Trade	0.00466	[0.00994]	0.021	[0.03445]
L. FDI	0.00441	[0.0076]	0.0287	[0.1004]
L. Kaopen	0.53088	[0.73916]	3.04714	[2.2565]
L. Inflation	0.00104**	[0.00049]	0.0068	[0.02395]
L. Govt expenditure	0.00093	[0.10129]	0.04382	[0.14934]
L. Life expectancy	-0.18015	[0.23662]	0.31**	[0.12095]
L. Dependency ratio	0.28693**	[0.12289]	-1.148	[0.86391]
L. Govt orientation	-0.22044**	[0.10748]	0.57713	[0.81361]
L. Democracy Index	0.05509	[0.17443]	-0.77013*	[0.38919]
L. Unemployment	0.04576	[0.0615]	-0.34108**	[0.15878]
L. Human capital index	-3.52184	[2.61439]	-21.21329	[13.28821]
L. Urban population	0.08814	[0.0954]	0.38192	[0.37867]
Inverse Mills ratio	-0.17215	[0.31552]	0.2465	[0.67166]
L. No. Conditions FP	0.04521	[0.11088]	0.72025*	[0.38101]
L. No Conditions Non-FP	-0.00523	[0.03087]	-0.11652	[0.08278]
L. Scope	-0.12296	[0.08923]	-0.02235	[0.2479]
L. Govt exp. x FP	-0.00379	[0.00726]	-0.04647*	[0.02321]
L. Govt exp. x Non-FP	0.00206	[0.00232]	0.00921	[0.00592]
Constant	17.87254	[26.05968]	65.01669	[56.31675]
R2	0.138		0.511	
N	1485		276	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.4.2 Poverty-reduction measures

Dependent Variable	Gini of net income, additional variables			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.58658	[0.55913]	-1.07742	[1.56807]
L. GDP per cap (ln)	2.55854	[1.95073]	7.99322*	[4.1493]
L. Trade	0.00498	[0.00989]	0.01609	[0.03951]
L. FDI	0.00466	[0.00769]	0.06242	[0.0992]
L. Kaopen	0.51717	[0.74166]	3.16022	[2.26266]
L. Inflation	0.00101**	[0.00048]	0.00398	[0.02311]
L. Govt expenditure	-0.00026	[0.10087]	0.03771	[0.15428]
L. Life expectancy	-0.17991	[0.23807]	0.2904**	[0.1329]
L. Dependency ratio	0.28485**	[0.12328]	-1.17401	[0.8931]
L. Govt orientation	-0.22011**	[0.10733]	0.52839	[0.86644]
L. Democracy Index	0.05918	[0.17488]	-0.73503*	[0.37715]
L. Unemployment	0.04182	[0.05992]	-0.31772*	[0.1578]
L. Human capital index	-3.60967	[2.62958]	-22.06286	[13.55963]
L. Urban population	0.08915	[0.09481]	0.3211	[0.39583]
Inverse Mills ratio	-0.18928	[0.31789]	0.26583	[0.70734]
L. No. Conditions POV	-0.50907	[0.87984]	3.39931**	[1.36365]
L. No Conditions Non-POV	0.00602	[0.02372]	-0.04281	[0.04734]
L. Scope	-0.13776	[0.09104]	-0.00457	[0.24822]
L. Govt exp. x POV	0.10291*	[0.05882]	-0.19339**	[0.09425]
L. Govt exp. x Non-POV	0.00087	[0.00141]	0.00417	[0.00422]
Constant	18.44828	[26.04827]	69.64518	[58.84254]
R2	0.139		0.509	
N	1485		276	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.4.3 External sector

Dependent Variable	Gini of net income, additional variables			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.64361	[0.55864]	-0.90106	[1.44305]
L. GDP per cap (ln)	2.4748	[1.96139]	7.28191*	[4.1499]
L. Trade	0.00616	[0.00979]	0.02008	[0.04045]
L. FDI	0.00264	[0.00743]	0.0011	[0.11592]
L. Kaopen	0.60373	[0.77682]	4.42076	[2.61021]
L. Inflation	0.00092*	[0.00048]	0.00976	[0.02451]
L. Govt expenditure	0.02011	[0.09517]	0.10891	[0.1308]
L. Life expectancy	-0.17618	[0.23264]	0.29458**	[0.12577]
L. Dependency ratio	0.27903**	[0.12472]	-1.05672	[0.91928]
L. Govt orientation	-0.2191**	[0.10396]	0.60158	[0.90257]
L. Democracy Index	0.05964	[0.17228]	-0.75558*	[0.38519]
L. Unemployment	0.03654	[0.06091]	-0.32096*	[0.17203]
L. Human capital index	-3.66405	[2.64632]	-21.80561	[13.48922]
L. Urban population	0.08975	[0.09547]	0.42946	[0.40381]
Inverse Mills ratio	-0.19229	[0.30865]	0.17003	[0.7]
L. No. Conditions EXT	-0.10745	[0.14856]	-0.64101	[0.56015]
L. No Conditions Non-EXT	0.04665	[0.04112]	0.13947	[0.10047]
L. Scope	-0.12535	[0.09234]	-0.00451	[0.2618]
L. Trade x EXT	0.00025	[0.00251]	0.00707	[0.00928]
L. Trade x Non-EXT	-0.00016	[0.00043]	-0.0012	[0.00131]
L. FDI x EXT	0.02399	[0.01849]	-0.00242	[0.05013]
L. FDI x Non-EXT	-0.00166	[0.00169]	0.00491	[0.00871]
L. Kaopen x EXT	-0.09665	[0.27484]	0.82628	[0.73941]
L. Kaopen x Non-EXT	-0.00805	[0.05025]	-0.18236	[0.1116]
Constant	18.81179	[26.2454]	63.09937	[60.18663]
R2	0.141		0.505	
N	1485		276	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

7.5.4.4 Financial sector

Dependent Variable	Gini of net income, additional variables			
Model	1		2	
Sample	Non-SSA		SSA	
L. IMF programme	0.53896	[0.53132]	-1.12809	[1.32354]
L. GDP per cap (ln)	2.69325	[1.92785]	7.1645	[4.28937]
L. Trade	0.00444	[0.00999]	0.01358	[0.03865]
L. FDI	0.0044	[0.00753]	0.06074	[0.09408]
L. Kaopen	0.46439	[0.72992]	3.50744	[2.51867]
L. Inflation	0.00111**	[0.00046]	0.02849	[0.03841]
L. Govt expenditure	0.0265	[0.09679]	0.09957	[0.13623]
L. Life expectancy	-0.18644	[0.23239]	0.30338**	[0.12155]
L. Dependency ratio	0.27981**	[0.12245]	-1.11033	[0.89443]
L. Govt orientation	-0.20606*	[0.10689]	0.39864	[0.96946]
L. Democracy Index	0.04965	[0.17456]	-0.68231*	[0.35101]
L. Unemployment	0.05243	[0.05992]	-0.30816*	[0.16673]
L. Human capital index	-3.57855	[2.61977]	-22.2916	[13.3553]
L. Urban population	0.08396	[0.09376]	0.42021	[0.37937]
Inverse Mills ratio	-0.14727	[0.29934]	0.34819	[0.66519]
L. No. Conditions FIN	0.03965	[0.04055]	0.06532	[0.1889]
L. No Conditions Non-FIN	-0.00048	[0.01738]	0.04563	[0.07803]
L. Scope	-0.11645	[0.08791]	-0.02812	[0.2172]
L. Inflation x FIN	-0.00335***	[0.00106]	-0.00152	[0.00693]
L. Inflation x Non-FIN	0.00174***	[0.00056]	-0.00124	[0.00261]
Constant	17.73908	[25.79831]	67.22254	[55.76891]
R2	0.145		0.498	
N	1485		276	

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.