Reviewer: 2

Comments for the reviewer

The second revision of the paper has addressed many of my previous concerns, and I commend the authors for the greatly increased clarity of the research design. That said, my doubts persist about the ability of the analysis to convincingly establish the link between ratings, policy and inequality. This is partly because of questions about the ability of the current instrumental variables to deal with endogeneity, and partly because of the lack of any attempt to show that policy makers in fact pay attention to policy recommendations attached to ratings.

**RESPONSE: We share the reviewer’s concern with endogeneity and thank the reviewer for identifying two areas where the manuscript could be improved to deal with this issue. First, we provide additional support that the current instrumental variables appropriately address the problem of endogeneity, and second present evidence that policy makers do appear to pay attention to policy recommendations attached to ratings.**

**Regarding the second concern, we follow the reviewer’s advice and present several brief case studies showing that governments may observe the policy recommendations of CRAs in response to a downgrade. While we are not fully able to attribute the policy decisions of countries to CRA recommendations, as there are a litany of reasons that may explain why policy makers enact economic policies, we provide evidence that countries act in accordance with CRA recommendations when they likely should not for short-term political reasons. The problem here is that the CRAs often provide beneficial economic advice, so it is difficult to show that governments are following those strategies because of the CRAs, and not because it is the right thing to do. However, we have some leverage here, because the advice provided by CRAs and the types of policies preferred by governments in response to economic downturns are often at cross purposes. On the one hand, governments prioritize short-term economic solutions (e.g., countercyclical spending that can increase debt) as their political survival are at stake if they are seen as having a lagging response (Remmer 1991, Benton 2005; Hernández and Kriesi 2016). On the other hand, CRAs are more interested in countries adopting policies that promote long-term economic performance and debt repayment, not policies that incur increased debt loads. We present evidence showing that leaders in several developing countries followed the advice of CRAs instead of adopting policies that would provide short-term economic benefits, the very type of policies that they are incentivized to implement.**

**However, we found it challenging to give much detail in the case studies as we had less than 800 words available without exceeding the maximum 10,000 word count of the journal. Notwithstanding, and as the reviewer advised, we identify the recommendations CRAs provide in the reports accompanying their rating decisions, and the policy measures governments put in place following a downgrade.**

**Here is what we write on pp. 4-6:**

**“We also report some brief examples where governments appear responsive to the advice of CRAs following ratings changes. As national governments are reticent to attribute policy changes to rating downgrades, we cannot fully rule out the possibility of unintentionally contemporaneous policy decisions. However, there are instances where leaders enact policies consistent with CRA recommendations that produce short-term economic deteriorations, running contrary to expectations, as officials for political reasons often prioritize short-term gains over long-term sustainability.**

**Starting with Brazil, in the summer of 2002, both S&P and Moody’s downgraded its sovereign bonds. Moody’s (2002) recommended Brazil maintain high primary surpluses, cut government spending by restraining minimum and public sector wages to lower its fiscal deficits, and intensify neoliberal policies to promote longer-term growth. The newly-elected Luiz Inácio “Lula” da Silva, a leftist labor leader, who for decades had supported increased spending for the working class and poor and opposed market reforms, reduced government expenditures by nearly 8 percent in 2003 and 13 percent in 2004 (World Bank 2018). The government cut public employee wages by 6.2 percent in 2003 (Barbosa-Filho 2008, 203), and, in 2004, its “nonfinancial public sector surplus reached 5.8 percent of the GDP” (Campello 2015, 104). The government also expanded trade and financial reforms and privatization by introducing a fully flexible exchange rate. S&P and Moody’s boosted Brazil’s ratings in September 2004, with Moody’s (2004) noting “the positive developments in the overall Brazilian economy are closely linked to the maintenance of a tight fiscal policy and a fully flexible exchange rate regime,” policies endorsed by the CRAs.**

**Similarly, Moody’s and S&P both downgraded Vietnam’s sovereign bonds in 2012. Moody’s (2012) provided two recommendations: (1) improve the banking system's credit profile, decreasing contingent risks to the government; and (2) increase fiscal and macroeconomic management transparency. In 2013, Vietnam’s government implemented aggressive economic restructuring designed to deal with the issues raised by the CRAs. First, the government took action to stabilize the exchange rate, while increasing foreign currency reserves and cutting interest rates, to shore up domestic markets and improve the banking system’s credit profile. Next, Prime Minister Nguyen Tan Dung announced that starting in February of 2013, foreign strategic investors would be allowed to hold up to a 20 percent (up from 15 percent) stake in domestic financial institutions to speed up bank restructuring and clean up bad debt (Barbour-Lacey 2014). Moody’s would revise its rating upwards, citing a strengthening of the balance of payments and external payments position, and an increase in transparency, policies it had earlier recommended to limit the government's balance sheet risks.**

**In Malaysia, after the East Asian financial crisis, Moody’s (1998) reported that the imposition of capital controls and a fixed exchange rate would “result in an increase in government debt.” Both Moody’s and S&P downgraded Malaysia’s bond rating, with Moody’s decreasing it by three notches. In response, the Mahathir government phased out capital and currency control measures, despite their contribution to economic recovery, in an apparent attempt to curry CRA favor.**

**Brazil, Vietnam, Malaysia, and others,[[1]](#footnote-1) illustrate a trend where countries abandon policies that would produce short-term benefit and pursue reforms that mirror those recommended by CRAs. While CRAs prioritize stability and decreasing debt, political leaders are incentivized to take action that produces the greatest benefit in the short-term. Our cases suggest that policy makers may pay attention to policy recommendations attached to ratings changes.”**

**Regarding the first issue of endogeneity, we agree with the reviewer that finding instrumental variables in cases of mutual causation is exceedingly difficult, and a problem facing the majority of research employing these methods. However, we believe we have provided sufficient evidence to give some assurance that our results do not result from problems that prior researchers encountered when conducting similar research. We utilize recent methodological innovations in political science and construct two separate compound instruments (e.g., DiGiuseppe and Shea 2016, Lang, 2016; Nunn and Qian, 2014). Using compound instruments is similar to a (continuous) difference-in-difference design: the impact of bond ratings on income inequality is compared between country-years with high and low ratings. Thus, the relevance condition is satisfied insofar as sovereign bond ratings decrease in times of scarce resources (Lang, 2016). That is, as the average sovereign bond rating in a given year increases, the likelihood that any country will receive a bond rating increase decreases. This is related to the cyclical nature of risk. The CRAs consider global investors' risk aversion, which correlates with international financial trends (Baek, Bandopadhyaya, and Du 2005), indicating that in times of scarcity, the likelihood of bond rating downgrade rises, and during times of financial abundance, the likelihood of a bond rating downgrade falls, indifferent to the economic conditions in any specific country. From the perspective of borrowing governments, bond ratings declines are more likely during economic hard times, even when those hard times are not specifically experienced within their borders. Thus, the interaction of international financial conditions with a country specific characteristic varies both across countries as well as over time and, after controlling for the constituent variables, the interaction introduces exogenous variation. This exogenous variation provides us with the confidence that our instruments are not correlated to the error term of our second stage.**

**We understand and acknowledge that this is a limitation to our analysis, and indicate it in the paper. However, with the increased evidence provided above that governments are following the policy recommendations of CRAs, we believe that we have provided enough evidence to overcome this limitation.**

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**Appendix 1 – Variables**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Mean** | **S.D.** | **Min** | **Max** | **Description & Source** |
| Income Inequality  | 37.87 | 9.13 | 15.14 | 64.65 | Gini coefficient of net income inequality, from SWIID version 5.0 (Solt 2015). |
| Change in Income Inequality | 0.06 | 0.97 | -3.84 | 3.42 | Gini coefficient of net income inequality, from SWIID version 5.0 (Solt 2015). |
| CRA Change Moody’s | 0.01 | 0.77 | -5 | 9 | The first difference of CRA rating letters in ordinal scale (0-16), (from Moody’s website). |
| CRA Change S&P | 0.03 | 0.74 | -3 | 11 | The first difference of CRA rating letters in ordinal scale (0-16), (from S&P website). |
| GDP (ln)  | 23.49 | 2.37 | 16.27 | 30.52 | Logged gross domestic product in constant 2010 US$ (World Bank 2015). |
| GDP Growth | 3.66 | 6.94 | -64.05 | 149.97 | Yearly percent change in Gross Domestic Product 2010 US$ (World Bank 2015) |
| Inflation | 30.59 | 308.19 | -11.69 | 11749 | Annual inflation rate (IMF 2015). |
| Current Account Balance  | -2.39 | 9.39 | -240.5 | 56.70 | The sum of the balance of trade (goods and services exports less imports), net income from abroad, and net current transfers (World Bank 2015). |
| Natural Resources | 8.40 | 13.38 | 0 | 92.02 | Total ores and metals exports plus fuel exports (% total merchandise exports) (World Bank 2015). |
| Trade | 74.32 | 47.33 | 4.98 | 439.66 | Exports plus imports (% GDP) (World Bank 2015). |
| Unemployment | 8.26 | 5.22 | 0.70 | 26.86 | The share of the labor force that is without work but available for and seeking employment. ILOSTAT database (World Bank 2015) |
| Social Contributions | 13.63 | 15.07 | 0 | 65.82 | Social contributions include social security contributions by employees, employers, and self-employed individuals. (World Bank 2015) |
| IMF SA Program | .21 | .10 | 0 | 1 | Inclusion in an IMF Structural Adjustment Program Data from Kentikelenis., Stubbs, & King (2016). |
| Population (ln) | 15.59 | 1.98 | 9.50 | 21.04 | Natural log of national population (World Bank 2015). |
| % Population over 65 | 7.89 | 6.75 | 0.05 | 51.5 | The percentage of the population over the age of 65(World Bank 2015). |
| Polity | 6.43 | 3.31 | 0 | 10 | Scale ranges from 0-10 where 0 is least democratic and 10 most democratic (Freedom House 2015). |
| Regime Durability | 26.10 | 31.14 | 0 | 205 | The number of years since the most recent regime change (three point change in the polity score over a period of three years or less) (Marshall et al. 2014). |
| Left Executive | 0.31 | 0.46 | 0 | 1 | Dummy variable, 1 for leftist party control and 0 for all other parties (Beck et al. 2001). |
| Election  | 0.09 | 0.29 | 0 | 1 | Dummy Variable for year of executive election. Database of Public Institutions (2017)  |
| Government Spending | 1.03 | 0.13 | 0.21 | 2.09 | General government final consumption expenditure (World Bank 2015). |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **Variable** | **Mean** | **S.D.** | **Min** | **Max** | **Description & Source** |
| Income Assistance | 4.97 | 9.36 | 0 | 91.36 | Percentage of the population covered by programs specifically designed to provide financial assistance (UNU-WIDER SAPI Database 2018). |
| Social Assistance | 10.18 | 11.92 | 0 | 91.36 | Percentage income assistance plus programs designed to improve health and nutritional outcomes as well as to improve education, the network of social services, the wellbeing of the elderly, and tackle the intergenerational transmission of poverty (UNU-WIDER SAPI Database 2018). |
| Tax Burden | 72.9 | 15.5 | 0 | 100 | An index measure of individual and corporate income tax rates (Heritage Foundation 2019) |
| Labor Freedom | 60.7 | 16.4 | 0 | 100 | An index measure of the ability of businesses to contract freely for labor and dismiss redundant workers (Heritage Foundation 2019) |
| Investment Freedom | 53.2 | 21.4 | 0 | 95 | An index measure of free and open investment environment (Heritage Foundation 2019) |
| Monetary Freedom | 72.7 | 15.7 | 0 | 95.4 | An index measure of government intervention into the monetary supply, price controls, and inflationary policy (Heritage Foundation 2019) |
| Interest Rate Spread | 7.10 | 8.24 | -14.50 | 80.33 | Interest rate charged by banks on loans to private customers minus interest rate paid by commercial banks (World Bank 2015).  |
| Interest Rates | 17.0 | 82.1 | 0.5 | 297.5 | Interest rate charged by banks on loans to private customers adjusted for inflation (World Bank 2015). |
| Interest Rate – LIBOR | 5.39 | 7.65 | 0.02 | 294.37 | Interest rate charged by banks on loans to private customers minus the London Interbank Offer Rate (World Bank 2015). |
| LIBOR | 3.78 | 2.67 | 0.23 | 9.28 | London Interbank Offer Rate (FRED 2018) |

**Appendix 2 – Methodological Concerns**

**Endogeneity Analysis**

The Instrumental Variable estimator can avoid the bias that Ordinary Least Squares (OLS) estimates suffer from (absence of inconsistency) when independent variables in the regression are correlated with the error term in the equation of interest. The selection of instrumental variables requires identifying factors that are correlated to changes in the endogenous independent variable while not correlated (exogenous) to changes in the primary dependent variable. Unfortunately, previous research provides a dearth of possible instruments that produce expected change in bond ratings while also lacking a theoretical connection to income inequality. For this reason, we employ two separate identification strategies, one which relies on a neighborhood ratings previously employed by DiGiuseppe and Shea (2016), the other which utilizes exogenous variation in global financial trends previously employed by Lang (2016)

Our first method relies on two incremental repressors in the first stage of our analysis: the lagged value of the yearly average regional sovereign bond rating excluding a country’s individual rating and the total number of countries in the region whose experienced debt crises.[[2]](#footnote-2) Following DiGiuseppe and Shea (2016), we rely on Reinhart and Rogoff’s (2011) coding of debt crises, as a sovereign default or “the failure to meet a principal or interest payment on a due date,” and the United Nation’s classification of 21 different sub-regions to compile the count of external and domestic debt crises. Previous research indicates that bondholders often lack resources and so must use informational shortcuts to assess risk (Brooks et al. 2015), such as the credit risks of nearby countries, which is referred to as the “neighborhood effect” (Christopher et al. 2012; Gray 2013). Similarly, CRAs also use informational shortcuts because they are understaffed. Indeed, only one or a few persons from the CRAs may be responsible for monitoring an entire region. Thus, we include a measure of the average bond rating of other countries within the region. Next, we include the total number of countries whose sovereign bonds received ratings that year. As noted above, the larger number of countries rated in a particular year reinforces concern about CRAs using shortcuts. The larger number of countries rated may also provide added clues to debtor nations on the fairly secretive process of CRA ratings. Neighborhood shortcuts and number of countries rated by CRAs plausibly affect bond ratings but appear to have little clear direct impact on income inequality. This informational reliance on neighboring states can contribute to contagion that influences bond rates that spread from one state to another. We exploit the exogenous contagion process here to satisfy the exclusion restrictions. To control for path dependency, and the existence of first order autocorrelation, we employ a partial first differenced model in the second stage.[[3]](#footnote-3)

Thus, our methodology includes the following models:

1st Stage:

 (2.1)

2nd Stage:

 (2.2)

In the two equations, *X* is a set of exogenous control variables that are included in first-stage regressions. For the first and second equations, ʋ and ε, respectively denote the error terms, while and represent the country and year fixed effects. The instrumental variables are the two right side variables in model 1.

Our second identification strategy, established by Lang (2016), exploits exogenous variation in global financial trends, measured with the London Interbank Offer Rate (LIBOR). Consistent with recent research (Lang 2016; Nunn and Qian 2014), we interact this time-variant variable with a country-variant variable, indicating a country’s likelihood of experiencing a ratings change (LRC). The resulting interaction varies both across countries as well as over time and, after controlling for the constituent variables, the interaction introduces exogenous variation to the extent that the isolated interaction effect is excludable from alternative channels (Lang 2016). Previous literature has shown that global financial trends have a spill-over effect that can influence inequality in developing countries (Pieper and Taylor 1998, Lee, Nielsen, and Alderson 2007), but that these effects are consistently dependent on how the state reacts to growing globalization-related pressure. Thus, even if there were endogeneity between the time-variant level variable and the outcome, the exclusion restriction would only be violated if the unobserved variables driving this endogeneity were correlated with the country-specific likelihood (for econometric details see Nizalova and Murtazashvili 2016). Specifically, we use the 3-month certificate of deposit rate (LIBOR), and interact it with the fraction of years that the country has experienced a rate change between 1995 and year *t (CRAprobit)*.

In the first-stage equation is regressed on this interaction term and on all second-stage variables*.* While year fixed effects control for the level effect of the global financial trends, we also control for *CRAprobit* in both stages. The identification can therefore be interpreted as a difference-in-difference approach: After controlling for the levels, the IV’s coefficient indicates how global financial trends affects the likelihood of receiving a sovereign bond downgrade in year *t* differently in countries with different participation probabilities. Similar to the above approach, we employ a partial first differenced model in the second stage.

Thus, our methodology includes the following models:

1st Stage:

 (2.3)

2nd Stage:

 (2.4)

In the two equations, *X* is a set of exogenous control variables that are included in first-stage regressions. For the first and second equations, ʋ and ε, respectively denote the error terms, while and represent the country and year fixed effects. The instrumental variables are the two right side variables in Model 1.

 Some readers, however, might worry that global financial trends, as measured by LIBOR, threaten the excludability of the instrument. However, even if there was a correlation it would have to be conditional on *CRAprob* because of the difference-in-difference style model the interacted IV estimates.

**Mediation Analysis**

Since the publication of Baron and Kenny (1986), numerous social scientists, including political scientists, have frequently turned to mediation analysis to identify intermediate variables thought to lie in the causal path between treatment and outcome variables. While there are a few traditional approaches to mediation analysis (see VanderWeele 2016), causal mediation analysis employed in this paper has been formulated, and implemented within the framework of linear structural equation modeling (LSEM; e.g. Baron & Kenny 1986; Little et al 2007; MacKinnon 2012). The LSEM can be interpreted as an Average Causal Mediation Effect (ACME) estimator under the sequential ignorability assumption (Baron and Kenny 1986). The sequential ignorability assumption requires that two ignorability assumptions be made sequentially. First, given the observed independent confounders, the assignment of mediating variables values is assumed to be ignorable, that is, statistically independent of potential outcomes and other potential mediators. Second, the mediator is ignorable given the observed mediator and independent confounders. Sequential ignorability (Imai, Keele, and Tingley 2010) assumes that the following two statements of conditional independence hold:

 (2.5)

 (2.6)

and all *x* X  *and m* M*.*

The second stage of sequential ignorability is a strong assumption and cannot be taken lightly. It is always possible that there might be unobserved variables that confound the relationship between the outcome and the mediator variables even after conditioning on the observed treatment status and the observed covariates. Due to the potential for violating the sequential ignorability assumption, Kraemer et al. (2008) proposed an alternative to the standard product of coefficients method by relaxing the no-interaction assumption. They argued that assuming no interaction between the treatment and the mediator is often unrealistic and can thus estimate the standard mediation analysis based on the single mediator LSEM as:

 (2.7)

 (2.8)

 (2.9)

After fitting each linear equation via least squares, the product of coefficients method identifies as an estimated mediation effect (MacKinnon et al., 2002). Similarly, the difference of coefficient methods yields the numerically identical estimate by computing because

 and always holds in the linear case. Imai, Keele, and Tingley (2010) show that under sequential ignorability and the additional no-interaction assumption, relaxed via the method implemented by Kraemer et al. (2008), the estimate based on the product of coefficients method can be interpreted as a valid estimate (i.e., asymptotically consistent) of the causal mediation effect as long as the linearity assumption holds (see also Jo 2008).

**Appendix 3 – The Effects of CRA Rating Change on Income Inequality (Selection Effects)**

Following the approach employed by Beaulieu et al. (2012) we employ a Heckman selection model to control for the potential of a selection effect in our analysis. The Heckman selection model begins with estimating a binary selection equation to generate non-selection hazard that allow us to control for the effect of unobservable factors of program participation decisions in the outcome equation, a method recommended by others (Heckman 1990; Atoyan and Conway 2006; Wei and Zhang 2010). The adoption equation (the first stage of the Heckman model) estimated is:

 (4.1)

where is a latent variable representing the selection into specific IMF conditions, and is the vector of country specific characteristics that influence the condition decision.

The choice of specific variables for the selection equation requires identifying factors that are correlated to changes in the endogenous independent variable while not correlated (exogenous) to changes in the primary dependent variable. Although the Heckman model is identified when the same independent variables appear in both the selection and outcome equations, it is generally recommended to include at least one extra explanatory variable that influences selection but not the subsequent outcome of interest. Following the approach of Beaulieu et al. (2012), we include both decade fixed effects and a variable measuring a country’s exports to the United States.

The second stage equation is estimated as:

 (4.2)

where is poverty. is a vector of variables that likely affect poverty, and is the corresponding parameter vector. is a variable equal to the number of specific IMF conditions a country is under at time t − 1. is a Mills ratio from a probit regression to predict the probability of IMF conditionality obtained from the first stage of the Heckman two-step technique, calculated as follows:

 (4.3)

Where φ is the density function of a standard normal variable, ϕ is the cumulative distribution function of a standard normal distribution and λi is the Mills ratio term.

**The Effects of CRA Rating Change on Income Inequality (Selection Effects – Full Model)**

|  |  |  |
| --- | --- | --- |
|  | Moody’s | S&P |
|  | (1) | (2) | (3) | (4) |
|  | Coef. | S.E. | Coef. | S.E. | Coef. | S.E. | Coef. | S.E. |
| *Income Inequality* |
| CRA Change  | -0.224\*\*\* | (0.040) | -0.222\*\*\* | (0.041) | -0.312\*\*\* | (0.042) | -0.303\*\*\* | (0.043) |
| GDP (ln)  | 0.013 | (0.041) | -0.083 | (0.061) | 0.013 | (0.041) | -0.081 | (0.061) |
| GDP Growth | 0.005 | (0.007) | 0.002 | (0.008) | 0.005 | (0.007) | 0.003 | (0.008) |
| Inflation | 0.000 | (0.000) | 0.000 | (0.000) | 0.000 | (0.000) | 0.000 | (0.000) |
| Cur. Acct. Balance | -0.001 | (0.005) | -0.002 | (0.005) | -0.001 | (0.005) | -0.002 | (0.005) |
| Natural Resources | -0.006\* | (0.003) | -0.004 | (0.003) | -0.006\* | (0.003) | -0.004 | (0.003) |
| Trade (% GDP) | 0.001 | (0.001) | 0.001 | (0.001) | 0.001 | (0.001) | 0.001 | (0.001) |
| Unemployment | 0.014\* | (0.009) | 0.019\*\* | (0.008) | 0.014\* | (0.009) | 0.019\*\* | (0.008) |
| IMF SA Program | 0.047 | (0.065) | 0.046 | (0.068) | 0.046 | (0.065) | 0.045 | (0.068) |
| Population (ln) |  |  | 0.107\*\* | (0.048) |  |  | 0.105\*\* | (0.048) |
| % over 65 |  |  | 0.004 | (0.006) |  |  | 0.004 | (0.006) |
| Polity 2 |  |  | 0.010 | (0.015) |  |  | 0.010 | (0.015) |
| Regime Durability |  |  | 0.005\*\*\* | (0.002) |  |  | 0.005\*\*\* | (0.002) |
| Left Executive |  |  | -0.033 | (0.068) |  |  | -0.033 | (0.068) |
| Election |  |  | -0.012 | (0.092) |  |  | -0.012 | (0.092) |
| Left\*Election |  |  | -0.132 | (0.168) |  |  | -0.134 | (0.168) |
| Constant | -0.568 | (1.144) | -0.199 | (1.050) | -0.568 | (1.145) | -0.223 | (1.050) |
| *Rated by Credit Agency* |
| GDP (ln)  | 0.507\*\*\* | (0.029) | 1.032\*\*\* | (0.065) | 0.507\*\*\* | (0.029) | 1.032\*\*\* | (0.065) |
| GDP Growth | 0.008 | (0.008) | 0.017\* | (0.009) | 0.008 | (0.008) | 0.017\* | (0.009) |
| Inflation | -0.001\*\*\* | (0.000) | -0.001\*\*\* | (0.000) | -0.001\*\*\* | (0.000) | -0.001\*\*\* | (0.000) |
| Cur. Acct. Balance | -0.016\*\*\* | (0.005) | -0.024\*\*\* | (0.006) | -0.016\*\*\* | (0.005) | -0.024\*\*\* | (0.006) |
| Natural Resources | -0.016\*\*\* | (0.003) | -0.006 | (0.004) | -0.016\*\*\* | (0.003) | -0.006 | (0.004) |
| Trade (% GDP) | 0.006\*\*\* | (0.001) | 0.003\* | (0.001) | 0.006\*\*\* | (0.001) | 0.003\* | (0.001) |
| Unemployment | 0.068\*\*\* | (0.011) | -0.005 | (0.014) | 0.068\*\*\* | (0.011) | -0.005 | (0.014) |
| IMF SA Program | -0.190\*\* | (0.075) | 0.052 | (0.090) | -0.190\*\* | (0.075) | 0.052 | (0.090) |
| Population (ln) |  |  | -0.533\*\*\* | (0.063) |  |  | -0.533\*\*\* | (0.063) |
| % over 65 |  |  | -0.024\*\*\* | (0.007) |  |  | -0.024\*\*\* | (0.007) |
| Polity 2 |  |  | 0.159\*\*\* | (0.019) |  |  | 0.159\*\*\* | (0.019) |
| Regime Durability |  |  | -0.003 | (0.003) |  |  | -0.003 | (0.003) |
| Left Executive |  |  | -0.115 | (0.103) |  |  | -0.115 | (0.103) |
| Election |  |  | -0.091 | (0.134) |  |  | -0.091 | (0.134) |
| Left\*Election |  |  | 0.092 | (0.265) |  |  | 0.092 | (0.265) |
| Constant | -12.288\*\*\* | (0.695) | -16.231\*\*\* | (0.993) | -12.288\*\*\* | (0.695) | -16.231\*\*\* | (0.993) |
| Total Observations | 1,840 |  | 1,712 |  | 1,840 |  | 1,712 |  |
| Selected | 1,162 |  | 1,021 |  | 1,162 |  | 1,021 |  |
| Countries | 84 |  | 80 |  | 84 |  | 80 |  |
| *ρ* (*rho*) | 0.318\*\* |  | 0.103\* |  | 0.297\*\*\* |  | 0.102\* |  |
| Wald test (*ρ*=0) Chi2 | 0.021\*\* |  | 0.069\* |  | 0.023\*\* |  | 0.075\* |  |
| Heckman selection model with country and year *fixed effects*. Dependent variable: Yearly change in Income Inequality (SWIID). Selection: Country rated by credit rating agency. Note: All standard errors are robust and all independent variables lagged 1 year. Significance level: \* p<.1; \*\* p<.05; \*\*\* p<.01. |

**Appendix 4 - Cliff and Ratings Interactive Models (Moody’s) – Full Models**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| CRA Changet-1 | -0.593\* | -0.616\*\* | -0.402\* | -0.542\* |
|  | (0.309) | (0.241) | (0.221) | (0.313) |
| CRA Rating t-1 | 0.008 | -0.027\*\*\* |  |  |
|  | (0.055) | (0.012) |  |  |
| CRA Rating t-1\*CRA Change t-1 |  | -0.014\* |  |  |
|  |  | (0.008) |  |  |
| Cliff t-1 |  |  | 0.034 | -0.674\*\*\* |
|  |  |  | (0.248) | (0.220) |
| Cliff t-1 \*CRA Change t-1 |  |  |  | -0.026 |
|  |  |  |  | (0.742) |
| *Economic Controls* |  |  |  |  |
| GDP (ln)  | -0.180\* | -0.157\*\* | -0.218\* | -0.190 |
|  | (0.095) | (0.067) | (0.116) | (0.116) |
| GDP Growth | -0.005 | -0.014 | -0.027 | -0.030 |
|  | (0.034) | (0.041) | (0.025) | (0.030) |
| Inflation | 0.000 | 0.000 | 0.000 | 0.000 |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| Current Account Balance  | -0.014\* | -0.010 | -0.021\*\*\* | -0.022\*\*\* |
|  | (0.008) | (0.007) | (0.008) | (0.008) |
| Natural Resources | -0.015\* | -0.003 | -0.024\*\*\* | -0.027\*\*\* |
|  | (0.008) | (0.006) | (0.009) | (0.010) |
| Trade (% GDP) | 0.003 | 0.002 | 0.009\*\* | 0.010\*\* |
|  | (0.004) | (0.003) | (0.004) | (0.005) |
| Unemployment | 0.002 | 0.001 | -0.051 | -0.070 |
|  | (0.029) | (0.019) | (0.058) | (0.061) |
| Social Contributions | 0.003 | 0.006 | -0.008 | -0.010 |
|  | (0.008) | (0.007) | (0.010) | (0.012) |
| IMF SA Program | 0.074 | 0.084 | 0.019 | 0.039 |
|  | (0.100) | (0.102) | (0.097) | (0.113) |
| *Country Controls* |  |  |  |  |
| Population (ln) | 0.212\* | 0.191\*\*\* | -0.102 | -0.103 |
|  | (0.109) | (0.070) | (0.513) | (0.536) |
| % over 65 | 0.006 | 0.016 | 0.006 | 0.008 |
|  | (0.013) | (0.011) | (0.013) | (0.015) |
| Polity 2 | 0.039 | 0.019 | 0.005 | -0.000 |
|  | (0.033) | (0.023) | (0.048) | (0.054) |
| Regime Durability | -0.001 | 0.003 | -0.002 | -0.000 |
|  | (0.005) | (0.003) | (0.006) | (0.007) |
| Left Executive | -0.070 | -0.088 | -0.093 | -0.126 |
|  | (0.106) | (0.096) | (0.110) | (0.139) |
| Election Year | 0.034 | 0.008 | 0.012 | 0.029 |
|  | (0.112) | (0.114) | (0.105) | (0.107) |
| Left Executive\* | -0.072 | -0.053 | -0.056 | -0.008 |
|  Election Year | (0.205) | (0.209) | (0.183) | (0.209) |
| Constant | 13.252 | 11.027 | 6.935 | 6.369 |
|  | (10.553) | (11.059) | (7.896) | (8.105) |
|  |  |  |  |  |
| Observations | 1,056 | 1,056 | 1,056 | 1,056 |
| Number of Countries | 70 | 70 | 70 | 70 |
| R-Squared | 0.036 | 0.128 | 0.046 | 0.010 |
| Dependent variable: Yearly change in Income Inequality (SWIID). Note: All regressions include country and year *fixed effects,* and all standard errors are robust. All independent variables lagged 1 year. Significance level: \* p<.1; \*\* p<.05; \*\*\* p<.01. |

**Appendix 4 - Cliff and Ratings Interactive Models (S&P) – Full Models**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| CRA Changet-1 | -0.695\* | -0.573\* | -0.518\* | -0.615 |
|  | (0.353) | (0.304) | (0.318) | (0.476) |
| CRA Rating t-1 | 0.090 | -0.034\*\*\* |  |  |
|  | (0.080) | (0.011) |  |  |
| CRA Rating t-1\*CRA Change t-1 |  | -0.017\*\* |  |  |
|  |  | (0.008) |  |  |
| Cliff t-1 |  |  | 0.254 | -0.237\*\* |
|  |  |  | (0.268) | (0.111) |
| Cliff t-1 \*CRA Change t-1 |  |  |  | -0.042 |
|  |  |  |  | (0.601) |
| *Economic Controls* |  |  |  |  |
| GDP (ln)  | -0.222 | -0.069 | -0.169 | -0.170 |
|  | (0.207) | (0.153) | (0.103) | (0.103) |
| GDP Growth | 0.059 | 0.040 | -0.014 | -0.013 |
|  | (0.043) | (0.028) | (0.038) | (0.033) |
| Inflation | 0.000 | 0.000 | 0.000 | 0.000 |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| Current Account Balance  | -0.005 | -0.004 | -0.020\*\* | -0.020\*\* |
|  | (0.011) | (0.011) | (0.009) | (0.008) |
| Natural Resources | -0.020 | -0.028\*\*\* | -0.025\*\* | -0.024\*\* |
|  | (0.012) | (0.010) | (0.012) | (0.010) |
| Trade (% GDP) | -0.001 | -0.001 | 0.006\* | 0.006\* |
|  | (0.004) | (0.004) | (0.003) | (0.003) |
| Unemployment | 0.019 | -0.028 | -0.066 | -0.065 |
|  | (0.101) | (0.080) | (0.056) | (0.054) |
| Social Contributions | 0.007 | 0.006 | -0.001 | -0.001 |
|  | (0.011) | (0.010) | (0.008) | (0.008) |
| IMF SA Program | 0.089 | 0.072 | -0.016 | -0.014 |
|  | (0.108) | (0.106) | (0.092) | (0.104) |
| *Country Controls* |  |  |  |  |
| Population (ln) | -0.487 | -0.888 | -0.155 | -0.148 |
|  | (0.685) | (0.705) | (0.489) | (0.469) |
| % over 65 | 0.009 | 0.014 | 0.006 | 0.005 |
|  | (0.018) | (0.017) | (0.017) | (0.014) |
| Polity 2 | 0.115\* | 0.114\* | 0.022 | 0.022 |
|  | (0.061) | (0.059) | (0.045) | (0.047) |
| Regime Durability | 0.004 | 0.006 | 0.001 | 0.001 |
|  | (0.007) | (0.007) | (0.006) | (0.007) |
| Left Executive | 0.036 | 0.026 | 0.001 | 0.003 |
|  | (0.123) | (0.117) | (0.112) | (0.096) |
| Election Year | 0.086 | 0.134 | 0.032 | 0.032 |
|  | (0.119) | (0.129) | (0.099) | (0.098) |
| Left Executive\* | -0.326 | -0.379 | -0.170 | -0.172 |
|  Election Year | (0.223) | (0.233) | (0.175) | (0.171) |
| Constant | 11.515 | 15.051 | 6.636 | 6.535 |
|  | (10.337) | (10.654) | (7.309) | (6.958) |
|  |  |  |  |  |
| Observations |  |  | 1,056 | 1,056 |
| Number of Countries |  |  | 70 | 70 |
| R-Squared |  |  | 0.042 | 0.042 |
| Dependent variable: Yearly change in Income Inequality (SWIID). Note: All regressions include country and year *fixed effects,* and all standard errors are robust. All independent variables lagged 1 year. Significance level: \* p<.1; \*\* p<.05; \*\*\* p<.01. |

**Appendix 5– Mediation Effects (Full Models)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| DV: | Income Assistance | Income Inequality | Social Assistance | Income Inequality | Social Contribution | Income Inequality | Total Gov. Spend. | Income Inequality |
|  |  |  |  |  |  |  |  |  |
| Income Assistance |  | -0.041\* |  |  |  |  |  |  |
|  |  | (0.024) |  |  |  |  |  |  |
| Social Assistance |  |  |  | -0.134\*\*\* |  |  |  |  |
|  |  |  |  | (0.031) |  |  |  |  |
| Social Contributions |  |  |  |  |  | -0.209\*\*\* |  |  |
|  |  |  |  |  |  | (0.020) |  |  |
| Total Government  |  |  |  |  |  |  |  | -1.189\*\*\* |
| Spending |  |  |  |  |  |  |  | (0.487) |
|  |  |  |  |  |  |  |  |  |
| CRA Change  | -1.027\*\*\* | -0.251 | -0.953\*\*\* | -0.214 | -0.472\*\*\* | -0.324 | -0.003\*\*\* | -0.157 |
|  | (0.196) | (0.294) | (0.275) | (0.235) | (0.134) | (0.276) | (0.001) | (0.171) |
| GDP (ln)  | 4.524\*\*\* | -0.248 | 5.354\*\*\* | -0.136 | 1.453\*\*\* | 0.917\*\*\* | -0.016\*\*\* | 0.884\*\*\* |
|  | (0.864) | (0.416) | (1.168) | (0.585) | (0.532) | (0.300) | (0.003) | (0.278) |
| GDP Growth | -0.125\* | 0.044 | -0.029 | 0.001 | 0.011\*\*\* | 0.002\*\* | -0.000\* | 0.001 |
|  | (0.071) | (0.033) | (0.085) | (0.041) | (0.002) | (0.001) | (0.000) | (0.001) |
| Inflation | -0.057 | 0.161\*\*\* | -0.105 | 0.197\*\*\* | -0.105\* | 0.100\*\*\* | -0.011\*\*\* | 0.090\* |
|  | (0.081) | (0.038) | (0.100) | (0.048) | (0.062) | (0.035) | (0.000) | (0.046) |
| Current Account  | 0.056 | -0.140\*\*\* | 0.195\*\*\* | -0.136\*\*\* | -0.147\*\*\* | 0.020 | -0.002\*\*\* | -0.052\*\* |
| Balance | (0.049) | (0.023) | (0.056) | (0.028) | (0.043) | (0.024) | (0.000) | (0.022) |
| Natural Resources | -0.084\*\*\* | 0.002 | -0.073\*\*\* | -0.007 | -0.000 | -0.043\*\*\* | 0.000 | -0.009\*\* |
|  | (0.020) | (0.010) | (0.025) | (0.012) | (0.011) | (0.006) | (0.000) | (0.005) |
| Trade (% GDP) | -0.541\*\* | -1.217\*\*\* | -0.610\* | -0.716\*\*\* | 2.437\*\*\* | -0.864\*\*\* | -0.001\*\*\* | -1.442\*\*\* |
|  | (0.243) | (0.114) | (0.335) | (0.161) | (0.095) | (0.073) | (0.001) | (0.051) |
| Unemployment | -1.071 | 0.000 | -1.937 | 3.062\*\*\* | -0.263 | 0.548 | 0.007 | 1.032\*\* |
|  | (1.452) | (0.674) | (1.758) | (0.848) | (0.874) | (0.489) | (0.005) | (0.462) |
| IMF SA Program | -4.913\*\*\* | 0.454 | -6.557\*\*\* | 0.815 | -0.818 | -0.713\*\* | 0.006\*\* | -0.522\* |
|  | (0.915) | (0.441) | (1.223) | (0.620) | (0.527) | (0.296) | (0.003) | (0.274) |
| Population (ln) | -0.418\*\*\* | 0.401\*\*\* | 0.081 | -0.065 | 0.079 | 0.007 | 0.001\*\*\* | 0.075\* |
|  | (0.124) | (0.059) | (0.172) | (0.083) | (0.078) | (0.044) | (0.000) | (0.043) |
| % over 65 | 0.367 | 1.447\*\*\* | 0.995\*\*\* | 1.080\*\*\* | 0.166 | 0.958\*\*\* | -0.005\*\*\* | 0.850\*\*\* |
|  | (0.236) | (0.110) | (0.339) | (0.165) | (0.183) | (0.102) | (0.001) | (0.088) |
| Polity 2 | -0.051\* | 0.001 | -0.099\*\*\* | 0.018 | 0.040\* | 0.009 | 0.000\* | 0.036\*\*\* |
|  | (0.028) | (0.013) | (0.035) | (0.017) | (0.021) | (0.012) | (0.000) | (0.011) |
| Regime Durability | 2.605\*\* | 2.377\*\*\* | 3.676\*\* | 0.310 | 4.914\*\*\* | -0.631 | -0.008\* | -1.876\*\*\* |
|  | (1.245) | (0.581) | (1.616) | (0.784) | (0.773) | (0.444) | (0.004) | (0.431) |
| Left Executive | 1.564 | 0.439 | -0.049 | -0.504 | 0.686 | -0.352 | -0.002 | 0.082 |
|  | (1.699) | (0.789) | (2.036) | (0.977) | (1.080) | (0.605) | (0.006) | (0.602) |
| Election | -1.499 | -0.962 | 0.402 | 0.860 | -0.865 | 1.851\* | 0.010 | 1.473 |
|  | (2.646) | (1.228) | (3.263) | (1.565) | (1.923) | (1.077) | (0.011) | (1.079) |
| Constant | -5.756 | 35.415\*\*\* | -4.216 | 32.301\*\*\* | -27.215\*\*\* | 38.232\*\*\* | 1.372\*\*\* | 34.974\*\*\* |
|  | (13.396) | (6.218) | (16.325) | (7.834) | (8.156) | (4.601) | (0.043) | (5.954) |
|  |  |  |  |  |  |  |  |  |
| Observations | 360 | 360 | 541 | 541 | 957 | 957 | 1,056 | 1,056 |
| Countries | 45 | 45 | 52 | 51 | 61 | 61 | 70 | 70 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
| DV: | Tax Burden | Income Inequality | Labor Freedom | Income Inequality | Investment Freedom | Income Inequality | Monetary Freedom | Income Inequality |
|  |  |  |  |  |  |  |  |  |
| Tax Burden |  | -0.184\*\*\* |  |  |  |  |  |  |
|  |  | (0.016) |  |  |  |  |  |  |
| Labor Freedom |  |  |  | -0.185\*\*\* |  |  |  |  |
|  |  |  |  | (0.030) |  |  |  |  |
| Investment Freedom |  |  |  |  |  | -0.056\*\*\* |  |  |
|  |  |  |  |  |  | (0.014) |  |  |
| Monetary Freedom  |  |  |  |  |  |  |  | -0.029\*\* |
|  |  |  |  |  |  |  |  | (0.015) |
|  |  |  |  |  |  |  |  |  |
| CRA Change  | -0.835\* | -0.170 | -0.772\*\*\* | -0.156 | -0.962\*\* | -0.209 | -0.630\* | -0.222 |
|  | (0.493) | (0.246) | (0.266) | (0.245) | (0.438) | (0.268) | (0.383) | (0.267) |
| GDP (ln)  | 2.262\*\*\* | 0.453\* | 3.704\*\*\* | 0.307 | 4.010\*\*\* | 0.871\*\*\* | 3.843\*\*\* | 0.986\*\*\* |
|  | (0.468) | (0.236) | (0.252) | (0.257) | (0.604) | (0.259) | (0.552) | (0.259) |
| GDP Growth | -0.013\*\*\* | 0.003\* | -0.008\*\*\* | 0.002 | 0.001 | 0.001 | -0.042\*\*\* | 0.000 |
|  | (0.003) | (0.002) | (0.002) | (0.002) | (0.004) | (0.002) | (0.004) | (0.002) |
| Inflation | -0.204\*\*\* | 0.094\*\*\* | -0.019 | 0.043 | -0.156\*\* | 0.084\*\* | -0.029 | 0.083\*\* |
|  | (0.060) | (0.030) | (0.032) | (0.030) | (0.078) | (0.033) | (0.071) | (0.033) |
| Current Account  | 0.152\*\*\* | -0.018 | -0.107\*\*\* | 0.015 | -0.258\*\*\* | -0.027 | -0.172\*\*\* | -0.032 |
| Balance | (0.042) | (0.021) | (0.023) | (0.021) | (0.054) | (0.023) | (0.050) | (0.023) |
| Natural Resources | 0.024\*\* | -0.044\*\*\* | 0.002 | -0.036\*\*\* | -0.093\*\*\* | -0.039\*\*\* | 0.036\*\*\* | -0.038\*\*\* |
|  | (0.011) | (0.006) | (0.006) | (0.006) | (0.014) | (0.006) | (0.013) | (0.006) |
| Trade (% GDP) | 0.025 | -0.581\*\*\* | -0.125\* | -0.658\*\*\* | 0.127 | -0.666\*\*\* | -0.282\* | -0.674\*\*\* |
|  | (0.131) | (0.065) | (0.071) | (0.065) | (0.170) | (0.071) | (0.155) | (0.071) |
| Unemployment | -0.191\*\*\* | -0.206\*\*\* | -0.162\*\*\* | -0.218\*\*\* | -0.094\* | -0.255\*\*\* | -0.334\*\*\* | -0.264\*\*\* |
|  | (0.038) | (0.019) | (0.020) | (0.019) | (0.049) | (0.021) | (0.045) | (0.021) |
| IMF SA Program | 1.734\*\* | 0.451 | -0.149 | 0.827\* | -0.142 | 0.475 | -0.112 | 0.472 |
|  | (0.856) | (0.428) | (0.461) | (0.424) | (1.105) | (0.464) | (1.011) | (0.463) |
| Population (ln) | -2.097\*\*\* | -0.100 | -4.725\*\*\* | 0.237 | -7.092\*\*\* | -0.689\*\* | -3.038\*\*\* | -0.782\*\*\* |
|  | (0.524) | (0.264) | (0.282) | (0.296) | (0.677) | (0.300) | (0.619) | (0.287) |
| % over 65 | -0.142\*\* | 0.139\*\*\* | -0.095\*\* | 0.158\*\*\* | 0.078 | 0.129\*\*\* | 0.164\*\* | 0.134\*\*\* |
|  | (0.070) | (0.035) | (0.038) | (0.035) | (0.090) | (0.038) | (0.082) | (0.038) |
| Polity 2 | 0.219 | 0.699\*\*\* | 1.102\*\*\* | 0.471\*\*\* | 2.408\*\*\* | 0.772\*\*\* | 1.328\*\*\* | 0.812\*\*\* |
|  | (0.170) | (0.085) | (0.092) | (0.091) | (0.220) | (0.098) | (0.201) | (0.094) |
| Regime Durability | -0.018 | 0.059\*\*\* | 0.004 | 0.041\*\*\* | 0.055\*\* | 0.054\*\*\* | 0.037 | 0.055\*\*\* |
|  | (0.021) | (0.010) | (0.011) | (0.010) | (0.027) | (0.011) | (0.025) | (0.011) |
| Left Executive | -3.094\*\*\* | 0.933\*\* | -0.617 | 1.094\*\*\* | -0.940 | 0.180 | 0.006 | 0.179 |
|  | (0.805) | (0.405) | (0.433) | (0.399) | (1.040) | (0.437) | (0.951) | (0.436) |
| Election | 1.432 | 0.305 | -0.039 | 0.571 | -1.159 | 0.203 | 0.972 | 0.231 |
|  | (1.097) | (0.548) | (0.591) | (0.544) | (1.418) | (0.595) | (1.296) | (0.594) |
| Left \* Election | -2.414 | 0.864 | -0.087 | 0.589 | -1.229 | 1.141 | -1.540 | 1.095 |
|  | (1.935) | (0.967) | (1.042) | (0.960) | (2.500) | (1.050) | (2.286) | (1.048) |
|  |  |  |  |  |  |  |  |  |
| Constant | 54.602\*\*\* | 20.261\*\*\* | 44.682\*\*\* | 22.814\*\*\* | 65.552\*\*\* | 34.673\*\*\* | 22.396\*\*\* | 35.365\*\*\* |
|  | (7.310) | (3.753) | (3.936) | (3.862) | (9.443) | (4.064) | (8.635) | (3.970) |
|  |  |  |  |  |  |  |  |  |
| Observations | 1,056 | 1,056 | 1,056 | 1,056 | 1,056 | 1,056 | 1,056 | 1,056 |
| Countries | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (17) | (18) | (19) | (20) | (21) | (22) |
| DV: | Rate Spread | Income Inequality | Interest Rate | Income Inequality | Rate - LIBOR | Income Inequality |
|  |  |  |  |  |  |  |
| Rate Spread |  | 0.130\*\*\* |  |  |  |  |
|  |  | (0.025) |  |  |  |  |
| Interest Rate |  |  |  | 0.031\*\* |  |  |
|  |  |  |  | (0.013) |  |  |
| Rate-LIBOR |  |  |  |  |  | 0.035\*\*\* |
|  |  |  |  |  |  | (0.013) |
|  |  |  |  |  |  |  |
| CRA Change  | -0.442\*\*\* | -0.238 | -0.666\*\*\* | -0.370 | -0.917\*\*\* | -0.359 |
|  | (0.139) | (0.283) | (0.247) | (0.281) | (0.245) | (0.282) |
| GDP (ln)  | 0.565 | 0.190 | -1.319 | 1.388\*\*\* | -0.102 | 1.350\*\*\* |
|  | (0.596) | (0.352) | (0.948) | (0.310) | (0.939) | (0.310) |
| GDP Growth | 0.099\*\*\* | -0.058\*\*\* | 0.212\*\*\* | -0.008 | 0.209\*\*\* | -0.009\* |
|  | (0.033) | (0.019) | (0.014) | (0.005) | (0.013) | (0.005) |
| Inflation | 0.252\*\*\* | 0.078\*\* | 0.366\*\*\* | 0.114\*\*\* | 0.321\*\*\* | 0.115\*\*\* |
|  | (0.059) | (0.035) | (0.107) | (0.035) | (0.106) | (0.035) |
| Current Account  | -0.029 | 0.044 | -0.090 | 0.022 | -0.081 | 0.022 |
| Balance | (0.046) | (0.027) | (0.081) | (0.027) | (0.081) | (0.027) |
| Natural Resources | -0.075\*\*\* | -0.039\*\*\* | -0.099\*\*\* | -0.040\*\*\* | -0.088\*\*\* | -0.040\*\*\* |
|  | (0.011) | (0.007) | (0.020) | (0.007) | (0.020) | (0.007) |
| Trade (% GDP) | -0.729\*\*\* | -0.872\*\*\* | -0.965\*\*\* | -1.067\*\*\* | -0.863\*\*\* | -1.067\*\*\* |
|  | (0.134) | (0.081) | (0.234) | (0.078) | (0.232) | (0.077) |
| Unemployment | 0.201\*\*\* | -0.236\*\*\* | 0.371\*\*\* | -0.200\*\*\* | 0.331\*\*\* | -0.200\*\*\* |
|  | (0.036) | (0.022) | (0.064) | (0.021) | (0.063) | (0.021) |
| IMF SA Program | 3.130\*\*\* | 0.331 | 5.036\*\*\* | 0.783 | 4.676\*\*\* | 0.778 |
|  | (0.852) | (0.508) | (1.548) | (0.510) | (1.532) | (0.509) |
| Population (ln) | -1.140\* | 0.326 | 0.230 | -1.212\*\*\* | -0.673 | -1.181\*\*\* |
|  | (0.647) | (0.382) | (0.903) | (0.295) | (0.894) | (0.295) |
| % over 65 | -0.033 | 0.017 | -0.036 | 0.030 | -0.014 | 0.029 |
|  | (0.075) | (0.044) | (0.138) | (0.045) | (0.137) | (0.045) |
| Polity 2 | 0.660\*\*\* | 0.557\*\*\* | 0.625 | 0.552\*\*\* | 0.529 | 0.554\*\*\* |
|  | (0.213) | (0.126) | (0.391) | (0.128) | (0.387) | (0.128) |
| Regime Durability | -0.026 | 0.051\*\*\* | -0.067\* | 0.023\*\* | -0.043 | 0.022\* |
|  | (0.021) | (0.013) | (0.035) | (0.012) | (0.035) | (0.011) |
| Left Executive | -0.537 | 1.335\*\*\* | 0.011 | 0.806\* | 0.008 | 0.806\* |
|  | (0.827) | (0.487) | (1.460) | (0.477) | (1.446) | (0.477) |
| Election | -0.272 | 0.156 | 3.001 | 0.208 | 3.206\* | 0.191 |
|  | (1.055) | (0.622) | (1.946) | (0.637) | (1.927) | (0.637) |
| Left \* Election | 1.282 | 0.467 | -1.051 | 0.968 | -0.955 | 0.969 |
|  | (1.825) | (1.075) | (3.365) | (1.100) | (3.331) | (1.099) |
|  |  |  |  |  |  |  |
| Constant | 20.255\*\* | 39.779\*\*\* | 55.175\*\*\* | 37.940\*\*\* | 37.232\*\* | 38.374\*\*\* |
|  | (8.280) | (4.903) | (15.012) | (4.960) | (14.862) | (4.926) |
|  |  |  |  |  |  |  |
| Observations | 1,056 | 1,056 | 1,056 | 1,056 | 1,056 | 1,056 |
| Countries | 70 | 70 | 70 | 70 | 70 | 70 |

**Appendix 6 – Robustness Checks**

|  |
| --- |
| **Robustness Check Models with Different Controls (Moody’s)** |
|  | (1) | (2) | (3) | (4) |
| Change Moody’s Ratingt-1  | -0.777\*\*(0.392) | -0.886\*(0.519) | -0.607\*(0.351) | -.146\*\*\*(0.735) |
| Change in Gini t-1 | -- | -- | 0.886\*\*\* (0.025) | 0.878\*\*\*(0.032) |
| *Economic Controls* |  |  |  |  |
| GDP (ln)  | -0.740\*\*\* (0.233) | -- | -0.193(0.169) | -0.286(0.425) |
| - GDP/capita (ln) | -- | 9.388\*\*(3.681) | 4.013(2.981) | 4.889(7.208) |
| Inflation | 0.000(0.001) | -0.001(0.001) | 0.000(0.001) | -0.001(0.003) |
| Current Account Balance | 0.000(0.000) | 0.000(0.000) | 0.000(0.000) | 0.000(0.000) |
| Natural Resources | 0.001(0.009) | -0.003(0.011) | 0.006(0.009) | -0.016(0.023) |
| Trade (% GDP) | -0.003(0.004) | -0.007(0.006) | -0.002(0.004) | -0.058\*\*\*(0.011) |
| - Social Spending (education) | -- | 0.018(0.052) | -.001(0.044) | 0.161(0.127) |
| - Social Spending (healthcare) | .0001\*(0.000) | -- | -- | -- |
| *Country Controls* |  |  |  |  |
| Population (ln) | -1.392(1.087) | -1.433(1.447) | -1.067(1.227) | 3.685(2.770) |
| - Life Expectancy | .167\*\*\* (0.064) | -- | 0.165\*\*(0.072) | -- |
| %Population over 65 | -- | 0.148\*\*(0.075) | -- | 0.231(0.148) |
| Polity2 | 0.126\*\*(0.058) | -- | 0.174\*\*\* (0.062) | -0.031(0.157) |
| -Democracy Dummy | -- | -0.009(0.265) | -- | -- |
| Regime Durability | 0.003(0.008) | 0.004(0.010) | -- | 0.028(0.021) |
| - Political Stability | -- | -- | -0.155(0.164) | -- |
| Left Dummy | 0.027(0.155) | -- | -- | 1.182\*\*\*(0.395) |
| - Right Dummy | -- | -0.081(0.189) | -0.101(0.152) | -- |
| Constant | -19.125(2.362) | -6.915(28.550) | 12.731 (23.117) | -17.673(52.566) |
| Obs. | 992 | 988 | 883 | 891 |
| Countries | 63 | 62 | 63 | 58 |
| Adjusted R2 | .156 | .197 | .609 | .749 |
| Prob>F | .000 | .000 | .000 | .000 |
| Dependent variable: Yearly change in Income Inequality (SWIID). Note: All regressions include country and year *fixed effects,* and all standard errors are robust. All independent variables lagged 1 year.Significance level: \* p<.1; \*\* p<.05; \*\*\* p<.01. |

|  |
| --- |
| **Robustness Check Models with Different Controls (S&P)**  |
|  | (1) | (2) | (3) | (4) |
| Change Moody’s Ratingt-1  | -0.518\*(0.271) | -0.561\*(0.319) | -0.374\*(0.208) | -1.022(0.644) |
| Gini t-1 | -- | -- | 0.879\*\*\*(0.023) | .889\*\*\*(.025) |
| *Economic Controls* |  |  |  |  |
| GDP (ln)  | -0.742\*\*\*(0.188) | -- | -0.259\*(0.134) | -0.140(0.315) |
| - GDP/capita (ln) | -- | 12.771\*\*\*(2.923) | 8.811\*\*\*(2.535) | 4.862\*\*(2.292) |
| Inflation | 0.000(0.001) | -0.002(0.001) | 0.000(0.001) | -0.002(0.002) |
| Current Account Balance | 0.000(0.000) | 0.000(0.000) | 0.000(0.000) | 0.000(0.000) |
| Natural Resources | -0.001(0.006) | -0.002(0.007) | 0.001(0.006) | -0.034\*(0.018) |
| Trade (% GDP) | 0.002(0.003) | -0.001(0.004) | 0.002(0.003) | -0.046\*\*\*(0.008) |
| - Social Spending (education) | -- | 0.016(0.045) | -0.006(0.043) | 0.167(0.107) |
| - Social Spending (healthcare) | 0.001\*\*(0.000) | -- | -- | -- |
| *Country Controls* |  |  |  |  |
| Population (ln) | -1.534\*(0.891) | -1.360(1.150) | -1.235(1.021) | 2.923(2.213) |
| - Life Expectancy | 0.130\*\*(0.054) | -- | 0.100\*(0.057) | --. |
| %Population over 65 | -- | -0.117\*(0.062) | -- | 275\*\*(0.123) |
| Polity2 | 0.129\*\*(0.053) | -- | 0.202\*\*\*(0.058) | -0.159(0.133) |
| -Democracy Dummy | -- | 0.141(0.209) | -- | -- |
| Regime Durability | -0.002(0.006) | 0.004(0.008) | -- | 0.022(0.016) |
| - Political Stability | -- | -- | -0.008(0.176) | -- |
| Left Dummy | 0.051(0.123) | -- | -- | 1.030\*\*\*(0.317) |
| - Right Dummy | -- | -0.040(0.139) | -0.006(0.121) | -- |
| Constant | -16.268(14.949) | -6.579(19.394) | 8.302(17.566) | -5.528(38.476) |
| Obs. | 1019 | 919 | 925 | 923 |
| Countries | 70 | 70 | 73 | 66 |
| Adjusted R2 | .142 | .133 | .474 | .698 |
| Prob>F | .000 | .000 | .000 | .000 |
| Dependent variable: Income Inequality (SWIID). Note: All regressions include country and year *fixed effects,* and all standard errors are robust. All independent variables lagged 1 year.Significance level: \* p<.1; \*\* p<.05; \*\*\* p<.01. |

**Robustness Check Models Limiting Sample to after 2000**

|  |  |  |
| --- | --- | --- |
|  | Moody’s | S&P |
|  | Neighborhood IV | Global Financial IV | Neighborhood IV | Global Financial IV |
| CRA Changet-1  | -0.488\* | -0.830\*\* | -0.593\*\* | -0.720\* |
|  | (0.275) | (0.328) | (0.235) | (0.395) |
| *Economic Controls* |  |  |  |  |
| GDP (ln) t-1  | -0.121\*\* | -0.214\*\* | -0.243\*\*\* | -0.132\*\* |
|  | (0.060) | (0.087) | (0.075) | (0.066) |
| GDP Growth t-1 | -0.030 | -0.009 | 0.002 | -0.032 |
|  | (0.027) | (0.031) | (0.139) | (0.041) |
| Inflation t-1 | 0.001 | -0.001 | -0.002 | 0.001 |
|  | (0.004) | (0.003) | (0.007) | (0.003) |
| Current Account  | -0.010 | -0.018\*\* | -0.025 | -0.006 |
|  Balance t-1 | (0.007) | (0.008) | (0.022) | (0.008) |
| Natural Resources t-1 | -0.007 | -0.012 | -0.014 | -0.005 |
|  | (0.006) | (0.009) | (0.061) | (0.005) |
| Trade (% GDP) t-1 | 0.006\*\* | 0.007 | 0.007 | 0.004\*\*\* |
|  | (0.002) | (0.005) | (0.005) | (0.002) |
| Unemployment t-1 | 0.014 | 0.016 | 0.034 | 0.011 |
|  | (0.019) | (0.035) | (0.104) | (0.017) |
| Social Contributions t-1 | 0.001 | 0.002 | 0.007 | 0.004 |
|  | (0.007) | (0.012) | (0.035) | (0.006) |
| IMF SA Program t-1 | 0.024 | -0.048 | -0.058 | -0.001 |
|  | (0.139) | (0.179) | (0.381) | (0.139) |
| *Country Controls* |  |  |  |  |
| Population (ln) t-1 | 0.200\*\*\* | 0.328\*\*\* | 0.279\*\*\* | 0.209\*\*\* |
|  | (0.070) | (0.119) | (0.091) | (0.071) |
| % over 65 t-1 | 0.024\*\* | 0.005 | -0.006 | 0.018\* |
|  | (0.012) | (0.020) | (0.075) | (0.011) |
| Polity 2 t-1 | 0.017 | 0.031 | 0.034 | 0.011 |
|  | (0.025) | (0.041) | (0.069) | (0.025) |
| Regime Durability t-1 | 0.007\* | 0.005 | 0.006 | 0.006\* |
|  | (0.004) | (0.005) | (0.014) | (0.004) |
| Left Executive t-1 | -0.104 | 0.039 | 0.122 | -0.094 |
|  | (0.126) | (0.199) | (0.343) | (0.103) |
| Election Year t-1 | 0.079 | 0.108 | 0.117 | 0.087 |
|  | (0.113) | (0.107) | (0.135) | (0.113) |
| Left Executive t-1\* | -0.059 | -0.198 | -0.222 | -0.163 |
|  Election Year t-1 | (0.202) | (0.199) | (0.291) | (0.200) |
| Constant |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Observations | 763 | 763 | 763 | 763 |
| Number of Countries | 65 | 65 | 65 | 65 |
| R-Squared | 0.017 | 0.025 | 0.059 | 0.030 |
| Dependent variable: Yearly change in Income Inequality (SWIID). Note: All regressions include country and year *fixed effects,* and all standard errors are robust. All independent variables lagged 1 year. Significance level: \* p<.1; \*\* p<.05; \*\*\* p<.01. |

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1. **Colombia is another example where Moody’s downgraded its sovereign bonds in 1999. When President Álvaro Uribe took office in 2002, he promptly adopted reforms recommended by the CRAs to “boost investors’ confidence” (Muñoz and Soto 2016, 88). Additionally, Kenya received a worse rating than it had expected from S&P in 2006. Kenya’s government implemented policies encouraged by the CRAs that temporarily abandoned countercyclical monetary policies to build up external reserves (Mandi 2014), at the expense of government spending, to improve the economy.**  [↑](#footnote-ref-1)
2. We considered using a third instrument in the first stage of our analysis, distance from global markets (i.e., New York City and London). It provides good results but there have been concerns raised about how important foreign capital market distance is with respect to CRA decision making. [↑](#footnote-ref-2)
3. While the inclusion of a lagged dependent is a typical means to control for path dependency, lagged dependent variables suck up considerable amounts of variation in other independent variables whose effects may linger over time (Plumper et al 2005), and models with lagged dependent variables often continue to suffer from first order autocorrelation, which leads to additional sources of model bias (Wilson and Butler 2007). [↑](#footnote-ref-3)