Rain Lasch

Applied Political Science Research Methods

Prof. Bessen

14 December 2021

Abstract

This paper analyzes the effect of foreign direct investment on state corruption. Foreign direct investment occurs when multinational corporations invest their resources, like facilities and capital, in another host country, so MNCs become directly involved in that country's economy. Many economists see FDI as an essential driver for development, especially in less developed countries (LDCs) that lack the market competitiveness to compete in the global economy. However, there may be downsides to FDI in the realm of corruption and human development, for while investments can clearly fuel economic advances, there is uncertainty with regards to whether or not they can be ill temptations for state officials and, in turn, whether increased FDI would increase corruption. I will conduct a time-series analysis of 57 countries from 2012 to 2015 using World Bank data on FDI and Transparency International data on corruption perception scores to examine the true nature of the relationship between FDI and corruption. The results show that FDI can positively affect CPI scores, and reduce corruption, in some conditions, but the effect is unclear in others. Such findings could give meaningful implications for how helpful or harmful FDI is in states' economic and institutional development.

Introduction

Whether FDI causally affects corruption is an important question to investigate because many scholars in the realm of international development see foreign direct investment as a major boost for development in LDCs. However, there can be huge downsides to foreign direct investment, and one problem comes from the idea of an international race to the bottom in terms of labor protections. The theory posits that as multinational corporations search for countries to invest in, those companies will look for states with the least amount of regulatory barriers so as to lower operating costs. Obviously, this can lead to many problems as developing countries' labor power may decrease with increased foreign investment, but it may also have implications for states' governance.

It seems that if states are willing to change their domestic economic policy in order to attract foreign direct investment, then state officials may even go as far as to act in a corrupt manner to obtain or exploit further investment. For instance, economic rents, which are bureaucratic extractions of money through the installation of unnecessary fees, are prevalent in corrupt governments, and if more foreign corporations dominate the market, then incentives for productive, rather than extractive, economic policy could be scarce.

For my data, I will be doing a cross-sectional time-series analysis of 57 countries from 2012 to 2015, and I will use OLS bivariate and multivariate regression to conduct analyses of the quantitative relationship between the variables. I will also add region and year fixed effects to account for time and regional differences. Furthermore, I will examine interactions between FDI, GDP, literacy, and resource rents to see how the effect of FDI on corruption depends on resource dependency, economic development, and education. I hypothesize that the positive effect of FDI on corruption depends on low resource reliance, sufficiently high economic development, and

high education as these factors directly influence the ability of states to utilize FDI in clean practice.

Literature Review

There is plenty of literature regarding the relationship between FDI inflows and corruption, but most analyses focus on the causal effect of corruption on FDI inflows. These papers suggest that companies looking to invest in states will either be deterred or encouraged to invest in a particular state given its amount of corruption, and this may mean there is some reverse causality present in my own analysis. However, both directional theories make sense, for investors are surely going to investigate how corrupt a state is beforehand, and FDI can also have an effect on corruption after its introduction. Other papers, like those of Pinto and Zhu and Larrain, have begun working on investigating the causal effect of FDI on corruption though. Overall, results from these analyses are mixed, and there is little certitude in both FDI and corruption's effects on one another.

Two analyses of FDI's effect on corruption show that conclusions are varied. In Felipe Larrain and Jose Tavares's "Does Foreign Direct Investment Decrease Corruption?," the authors found a significant negative relationship between FDI and corruption, finding that increased FDI inflows decreased national corruption[1]. Their models were robust and found that the effect of FDI inflows was comparable to the effect of per capita income, decreasing corruption by 0.3 on a scale of 1 to 10 for each percent increase in FDI as a share of output. Larrain and Tavares's analysis is important as it finds a significant relationship between my two variables of interest and finds that FDI robustly decreases corruption, but I feel that the authors did not take

[1] Felipe Larrain, and Jose Tavares, "Does Foreign Direct Investment Decrease Corruption?," *Cuadernos de Economía* 41, no. 123 (August 2004): 217-230, https://scielo.conicyt.cl/scielo.php?pid=S0717-68212004012300003&script=sci_arttext&tlng=p.

advantage of any controls for industrial development. For this reason, I have decided to account for electrical output to proxy for industrialization. In Pablo Pinto and Boliang Zhu's "Fortune or Evil? The Effect of Inward Foreign Direct Investment on Corruption," Pinto and Zhu found that FDI increased corruption in economic environments where MNCs became excessively dominant[2]. In their analysis, the availability of local resources and domestic competition is crucial, for states without either have little incentive to compete with MNCs and are thus more likely to extract and share rents. This paper is an important counter to Larrain and Tavares's, for while it does not find an opposite effect, their analysis does find that FDI's effect depends on economic conditions like market diversity, competition, and resources. This leads me to believe that controlling for states' GDP, or economic development, and resource rents as a share of GDP are important, for these give a sense of states' levels of economic development and diversity, which further gives an idea of how conducive those conditions are to competition and productivity. These papers demonstrate that the effect of FDI on corruption may be generally positive, but depending on certain factors, that effect may be more unpredictable or even negative, which gives further support to the necessity for interaction specifications.

Rahim Quazi's "Corruption and Foreign Direct Investment in East Asia and South Asia: An Econometric Study" lends support to the grabbing hand hypothesis, which claims that more corrupt countries increase transaction costs and thus deter FDI inflows[3]. Quazi found that corruption had a significant and robustly negative impact on FDI inflows as increases in corruption scores were associated with increases in FDI inflows. Quazi's model used controls for

---

[2] Pablo Pinto, and Boliang Zhu, "Fortune or Evil? The Effect of Inward Foreign Direct Investment on Corruption," *International Studies Quarterly* 60, no. 4 (December 2016): 693-705, https://doi.org/10.1093/isq/sqw025.

[3] Rahim Quazi, "Corruption and Foreign Direct Investment in East Asia and South Asia: An Econometric Study," *International Journal of Economics and Financial Issues* 4, no. 2 (2014): 231-242, https://www.researchgate.net/profile/Rahim-Quazi/publication/272564735_Corruption_and_Foreign_Direct_Investment_in_East_Asia_and_South_Asia_An_Econometric_Study/links/54e8de9e0cf2f7aa4d52e0d6/Corruption-and-Foreign-Direct-Investment-in-East-Asia-and-South-Asia-An-Econometric-Study.pdf.

location, economic freedom, infrastructure, and region fixed effects, indicating that locational and developmental differences are an important factor. The author did state, however, that this added to a mixed bed of study, for many previous analyses found different results. This paper is important as it shows that corruption discourages foreign direct investment, so with this in mind, foreign direct investment may similarly be used in clean ways as corporations may fear corrupt practices that would create unnecessary costs. However, Luisa Melo and Michael Quinn's "Oil, Foreign Direct Investment, and Corruption" makes an opposite case for two specific corporations: the Royal Dutch Shell in Nigeria and the United Fruit Company in Latin America[4]. As the authors note, these two companies turned a blind eye to corrupt practice as they mutually benefited from corrupt governance. This supports the helping hand theory, which sees corruption as easing costly bureaucratic processes and making FDI more efficient. From these papers, it is clear that attitudes toward the effect of corruption on FDI are vague, for alternative models and specific cases have given support to opposite findings regarding corruption's effect on FDI.

These analyses prove that attitudes regarding FDI and corruption's effects on one another are mixed, which means that the effect of FDI on corruption must depend on case specific conditions that are conducive for rent seeking. This is reassuring for my hypothesis, but finding the exact conditions that most affect FDI's relationship with corruption is difficult as there are vastly contrasting theories about whether variables from institutional strength to geography affect this relationship. For this reason, I will examine how the effect of FDI changes with varying amounts of resource rents, GDP, and literacy rates so as to determine which of these conditions most significantly affects FDI's relationship with corruption.

---

[4] Luisa Melo, and Michael Quinn, "Oil, Foreign Direct Investment, and Corruption," *The International Journal of Business and Finance Research* 9, no. 1 (2015): 33-49, https://www.theibfr.com/download/IJBFR/2015-ijbfr/ijbfr-v9n1-2015/IJBFR-V9N1-2015-3.pdf.

Theory

There are many possible explanations for how foreign direct investment can both help and harm states, but there is no question that corruption can play a part in how FDI inflows are distributed. Similarly to foreign aid, FDI, as an almost gift investment, can potentially become deleterious for states' economies if not applied properly, and various possible conditions could encourage corrupt use of FDI or an increase in corrupt behavior following the inflow of FDI. I hypothesize that states in which there is little economic development, economic diversity, and education will be more likely to have increased corruption as a result of FDI as these states fail to have the necessary conditions for the clean use of FDI.

States with insufficient economic development prior to FDI inflows will have much less incentive to innovate outside the invested-in-sector, and this will, in turn, promote rent seeking behavior as citizens and officials may merely exploit the influx of cash. This idea relates to the theoretical understanding of absorptive capacity, which is states' ability to effectively use foreign aid funds. Absorptive capacity posits that states without enough resources and institutional strength will be unable to effectively distribute aid, so states must, paradoxically, have enough resources prior to aid efforts in order to meaningfully redistribute aid funds. This is a confusing situation as it suggests that aid is essentially a waste in countries without enough resources, but these states are, inherently, the most in need of aid and assistance. I believe this idea can be applied to foreign direct investment as well, for while FDI does aim to build up states' resources so as to increase their capacity, these introduced resources can potentially be diverted for nefarious purposes without the necessary institutional strength, oversight, and capacity. For this reason, I believe that states lacking economic development will likely have increased corruption following FDI inflows.

In states with no economic diversity, there are few avenues for FDI to take that would not establish foreign industries as excessively dominant intrusions. This relates to the idea of the Dutch disease, where a rapid improvement of one sector leads to losses in productivity and growth throughout the rest of the economy as well as an overvaluation of domestic currency. Furthermore, new technologies in these industries would mean there are less workers required, and this may allow rent seeking behavior to proliferate as politicians and other occupations could freely work to extract exorbitant returns. In this scenario, investors and corporations would have no choice but to accept the state's corruption or entirely leave the state, and the former is much more likely to take place unless a large-scale scandal and subsequent investigation were to take place. From Pinto and Zhu, it is obvious that FDI may increase corruption where there is little market competition, but this idea also comes from the understanding of states with a resource curse, or economic dependency, with resources like oil. The oil industry, with its low skill work, expectations of high returns, and market dominance in entire regions, encourages few innovations in other economic sectors as it tends to overvalue currency, artificially inflating the host economy. Industries like these often receive state assistance, and for these reasons, highly dominant resource industries may act as breeding grounds for state corruption. Melo and Quinn found that this was markedly true for the Royal Dutch Shell and the United Fruit Company, so there is sufficient reason to believe this may happen in other states with particularly leading industries.

In states with low education, there may be few citizens outside a small group of elites that can effectively hold officials accountable and prevent them from acting in a corrupt manner. In Lindstedt and Naurin's "Transparency is Not Enough: Making Transparency Effective in Reducing Corruption," the authors found that even though freedom of information laws are not

significantly effective in reducing corruption alone, the ability of citizens to consume such information and then hold officials accountable is critical, and this ability comes only from education[5]. Education can then, in a sense, limit corrupt behavior as it enables citizens to remain adequately informed of government activity. With FDI, uneducated citizens may often have no idea of who investments are coming from, where they are going, or what actors are involved in the industry. For this reason, I think that only states with high enough levels of education can utilize FDI in a way that reduces corruption, for otherwise, I think there may be too much potential for officials and corrupt businessmen to exploit consumers, extract rents, and act generally corrupt. Literacy is the most fundamental aspect of education, for the ability to read and write precedes all other educational attainment. For this reason, I have decided to use literacy rates to examine the predicted differences between the effect of FDI on corruption in educated and uneducated states.

There may be many more important factors that influence both corruption and FDI, but I believe that these three factors may play the most significant role as they are indicative of deep determinants of state productivity. In the end, factors that directly relate to state productivity may more significantly explain corruption as corruption is basically practices as a way to make up for deficient state productivity, for officials see little hope in driving change that would similarly reap important benefits and are more prone to take shortcuts to obtain whatever kind of returns they can. In states with thriving productivity throughout society, there may be few reasons to act corrupt, for success may already be more easily attainable through genuine hard work. I believe states with inadequate economic development, economic diversity, and education will thus be

[5] Catharina Lindstedt, and Daniel Naurin, "Transparency is Not Enough: Making Transparency Effective in Reducing Corruption," *International Political Science Review* 31, no. 3 (June 2010): 301-322, https://doi.org/10.1177/0192512110377602.

more likely to have increased corruption with increased FDI inflows as the vital productivity that could create meaningful benefits from such investments is completely absent.

Research Design

For my research, I have collected data from the World Bank and Transparency International to analyze the effect of FDI on corruption. I have included controls for regionality, electric consumption per capita, GDP, literacy rates for adults 15 and up, and resource rents as a percentage of GDP. With these data, I will conduct a cross-sectional time series analysis taking advantage of region and year fixed effects along with interactions accounting for my different hypothesized conditional effects.

For foreign direct investment, I obtained data from the World Bank on net FDI inflows in current $US. Since this variable often goes into the hundreds of millions of dollars and is greatly varied across countries, I decided to log FDI inflows so as to compress the variance and have FDI in a sensical metric. Otherwise, it would be much too difficult to make sense of coefficient estimates and the wide dispersion of FDI values across countries would yield unreliable results. GDP and electrical consumption in kwH per capita both had similarly wide distributions, so I decided to log these variables as well. For resource rents, I used total natural resources rents as a percent of total GDP, so this variable and literacy rate are on a 0-100 scale. All controls (electric consumption, GDP, literacy, resource rents, and population density in people per square kilometer of land) also come from the World Bank's Open Data database.

At one point, I tried to introduce Worldwide Governance indicators to analyze the effect of institutional strength and political stability, but these variables introduced too much endogeneity, yielded excessive variance inflation, and greatly shrunk the sample size of my data

frame as these variables trimmed the number of countries in my data frame from 57 to 29. This much data elimination made models lose much of their significance and reliance. These variables may be important to examine, but after having conducted VIF tests on them in other models, I found that the variance inflation introduced by these indicators was too much as some, like the rule of law ranking, had variance inflation factors over 10. Along with this, Pakistan (extremely low literacy), Iraq (low literacy and high resource rents), and Mauritius (high population density) were found to have high leverage in some of my models, but creating dummy variables for each individual country data point did not seem like an effective solution nor was the amount of leverage enough to warrant such a manipulation. I feel that the variables I have chosen are the right ones for my analysis, and they also allow me to observe changes in a relatively large data set.

For corruption, I retrieved CPI scores from the Transparency International database, which is an international organization dedicated to combating state corruption. CPI scores range from 0-100 with scores closer to 100 representing states that are more clean and scores closer to 0 representing more corrupt states. Figure 1 shows that in my data set most countries fall into the range of 30-40 CPI scores, so the countries in my data are more corrupt than not. CPI, or corruption perceptions index, scores are created through survey data with experts on business and governance, so while this may not be a fully accurate measurement of state corruption, the measure is reliable in its depiction of state corruption. For the purposes of this analysis, CPI scores will be analyzed as a continuous, rather than discrete, variable, for even though scores fall on integer points from 0-100, the range of scores is large enough to analyze in a continuous fashion.

All variables, except for region and year, will thus be analyzed as continuous variables, so for all interactions I will include figures on marginal effects between the two terms of interest. I will use OLS regression to analyze estimated effects, and I have worried that time series OLS regression results with fixed effects will be hard to interpret and insignificant. However, I think that the slimness of the time range between 2012 and 2015 will make interpretation a bit easier and may help reveal significant predictors within a short time period. Overall, I think the data that I have will produce interesting results as they cover appropriate concepts for my hypothesis and occur in a sufficiently large sample and time frame.

Results

In order to fully explain the results, I will do my best to interpret each model and the difference in effects from different model specifications. From Figure 2, it is apparent that the relationship between FDI and corruption is indefinite, especially when observing FDI's effect across distinct regions. Because of this, regression with fixed effects is needed to get a fuller understanding of FDI's quantitative effects on corruption in individual regions, and I will analyze six models to demonstrate how the effect of FDI on corruption changes with increasingly complex model specifications.

Table 1 shows the most simple bivariate (1) and multivariate (2) regressions. In Model 1, FDI has a highly significant and positive effect on corruption as for each unit increase in log FDI, CPI scores will increase, and therefore reduce corruption by, 2.751 points. The intercept is insignificant and has a value of -19.788, so states with zero FDI are expected to be immensely corrupt. This model therefore predicts that with increased FDI, corruption will significantly improve, but this is a statistically elementary model that is in desperate need of controls. Model 2

incorporates all the controls, and this reveals some fascinating significance. FDI (2.561), electric consumption per capita (14.215), and population density (0.002) are all significant and have positive coefficients, and resource rents (-0.394), GDP (-3.188), and literacy rate (-0.5) are also significant but have negative coefficients. So, with all the controls present, the model predicts a similar effect of FDI on corruption while holding all else constant, and it also views increases in resource rents, GDP, and education as negatively affecting CPI scores and therefore increasing corruption, holding all else constant. This is captivating as it shows that increased education and economic development, on their own, produce greater corruption, which is not necessarily expected, but resource rents seem to be in line with my expectations as greater resource rents are associated with more corruption. In addition to these findings, increases in electrical output and population density are associated with decreased corruption, but population density is almost at zero. From this, it may be said that states with denser living and more electrical power available to its citizens will be less likely to be corrupt, which makes sense as closer living conditions may cause an intolerance of corruption and more electricity per person makes more information available to citizens to hold government officials accountable. Notably, only the intercept is insignificant and now positive, but this sign change has similar implications as before as it implies that states with zero resources, FDI, etc. will still be strongly corrupt on the CPI scale. This model shows some interesting relationships, but it does not take into account year or region fixed effects. In order to take time and regional differences into account, I will add dummy controls for year and region.

In Table 2, Model 1 shows the base fixed effects model with region and year fixed effects, and Models 2 through 4 show the base model estimates with added interactions. These dummy categories essentially create baseline values for the model from the reference categories,

which are the Americas region and 2012 in this model. Then, taking into account differences between the baseline and observed values, coefficients are estimated that reflect the variable's average effect within region-year units over time (i.e. the effects of variables on separate region-year units over 2012-2015). Creating dummy variables for these categorical variables is further useful for observing time variant factors like FDI and helps with heterogeneity bias by reducing variation and memory problems in time series analysis. In Figures 3, 4, and 5, regional differences become entirely evident as Western Europe is, on average, the least corrupt and receives the most FDI while the Middle East-North Africa has the highest average resource rents, so controlling for region fixed effects is crucial to observe differences in FDI's effect across these regions.

In Model 1, all of the same variables from the simple multivariate regression have retained their significance: FDI is significant and still around the previous estimate with an estimated effect of 2.4; GDP is significant and still negative with an estimated effect of -2.961; electricity is still highly significant with an estimate of 12.658; literacy is still significant with an estimated effect of -0.297; population density is still significant and slightly positive (0.003); and resource rents is still negative (-0.419) and significant. This further tells me that the variables I have chosen and the sample size are both good choices as different model specifications have not significantly changed coefficient estimates. The intercept of -2.417 represents the predicted CPI score of American region countries in 2012. Two regions, Europe-Central Asia (ECA) and Sub Saharan Africa (SSA), are both significant. The ECA region has a coefficient estimate of -6.147, and the SSA region has an estimate of 8.511. These mean that Europe-Central Asian countries, like Azerbaijan and Albania, are predicted to have CPI scores 6.147 points lower (predicted CPI score of -8.564) than the baseline 2012 American countries, holding all else constant. This makes

sense as well for the ECA region is the most corrupt in the data frame as shown in Figure 3. It is surprising though that Sub Saharan countries, like Angola, Gabon, and Niger, would then be predicted to be less corrupt than 2012 American countries by 8.511 points (predicted CPI score of 6.094), but this difference is not enough to predict that SSA countries would be clean as this would place them around 6 points on the CPI scale (which is atrocious in terms of corruption). In all, the fixed effects model holds similar estimated effects and significance as the previous model: FDI, electricity, and population density are predicted to have significantly positive effects on corruption, and GDP, education, and resource rents are predicted to have significantly negative effects on corruption. This model further shows that FDI may, overall, have a positive effect on corruption, but conditional circumstances can only be observed with the introduction of conditional interaction terms.

In Table 2, Model 2 shows estimates for a model with an interaction between logged FDI and GDP. However, since these two terms, and all subsequent interaction terms, are both continuous, it makes little sense to interpret estimates to show interaction significance as estimates are only given for when the conditioning term is absent, in this case when GDP is zero. Obviously, no country will ever have a total GDP of zero unless it is an unpopulated wasteland, so to observe how the effect of FDI changes with changing values of GDP, I will use marginal effects and predicted values plots to display interaction significance. In Model 2, all variables, except for FDI and GDP (the constitutive terms) and their interaction, are still significant with similar estimates, which further shows the need for interpreting the interaction with visualizations. From Figure 6, it is apparent that the interaction between FDI and GDP is totally insignificant as the marginal effects slope is nearly flat and the confidence interval overlaps zero throughout the plot. From this, I can confidently conclude that the effect of FDI on corruption

conditioned on GDP for different amounts of economic development is uncertain and may be either positive or negative. So, it would be wrong to say that FDI affects countries' corruption differently at different magnitudes of host country economic development, and this may mean that FDI should be directed to countries regardless of their economic development. Figure 7 shows the predicted CPI scores with shifting values of GDP in the interaction, so while holding FDI constant, the plot shows that at lower economic development, whether the state is predicted to be corrupt is largely random. At mid to high economic development though (more than ~24 log GDP), the model predicts states to be more corrupt. This is reflective of the interaction's insignificant coefficient estimate of -0.024 as increases in GDP are associated with decreases in CPI score, increasing corruption. This is absorbing again because it goes against my initial conditional hypothesis regarding economic development, but the predictions are a bit unclear, especially at lower quantities of economic development, and should be received with some skepticism.

Model 3 in Table 2 shows estimates for the interaction between FDI and literacy rates. All variables, except the constitutive terms and the interaction term, have again maintained significance. Surprisingly, the estimated effect of FDI is negative (-6.139), but to observe the significance of interaction effects, I will again interpret visualizations of marginal effects and predicted values. In Figure 8, the interaction between FDI and literacy is shown to become significant around 98% literacy, and beginning at this point, the estimated effect of FDI on corruption is about 2.6. So, for countries with extremely high literacy, the effect of FDI on corruption is significantly positive, increasing CPI scores by about 2.6 points for each unit increase in log FDI while holding controls and fixed effects constant. So, for countries with literacy rates below about 98%, which amounts to around 80.6% of the dataset, the effect of FDI

on corruption is ambiguous. From Figure 9, at around 89% literacy the confidence interval for predicted values becomes its most narrow, and around this area, CPI scores are expected to range from 33 to 43 points, which covers countries in the dataset like Mexico, Bosnia-Herzegovina, Brazil, and El Salvador. So, while the interaction estimates are insignificant, it would be accurate to say that predicted corruption with FDI at literacy rates from the high 80s to 90s is significantly corrupt as these countries can be safely described as corrupt to a certain degree. From this, it can be concluded that the model finds CPI scores to decrease with FDI most significantly after around 70% literacy rates, for after this point the confidence interval is entirely below CPI scores of 50 and would thus classify the country as more corrupt than not. For countries with low literacy though, the effect of FDI on corruption is uncertain. This model goes against my conditional hypothesis regarding education, for, controlling for a fixed FDI value, states with higher education are predicted to be more corrupt.

Model 4 in Table 2 shows coefficient estimates for a fixed effects model with an added interaction between FDI and resource rents. In this model, all significance and directional signs of the base fixed effects model have been retained except for the significance and direction of resource rents, and the interaction term is again shown to be insignificant. One exciting aspect of these new coefficients is that the standard error for the intercept (20.118) has significantly decreased relative to the other interaction models, which gives me some hope that this is a good model to analyze. Since the interaction estimate is insignificant and has little substance in interpretation, I will again look at marginal effects and predicted values plots to determine the interaction's significance. Figure 10 demonstrates that the effect of FDI on corruption in countries with less than about 6.5% resource rents as a share of GDP is significantly positive, and around this point, each unit increase in FDI is associated with about a 2.6 point increase in

CPI scores. A histogram of resource rents values is shown at the bottom, and most of the data fall into the range of 0-6.5% resource rents, which makes me skeptical as to whether this effect is brought about by a bias in the data. However, about a third of the data have resource rents above this value, and this seems like a fairly even distribution that would not introduce an excessive amount of bias. So, for states that have less than a 6.5% reliance on resources for the economy, FDI significantly lessens corruption, but in states with a greater dependence on resources, like Kuwait, Saudi Arabia, and Qatar, the effect of FDI on corruption cannot be determined. Furthermore, Figure 11 shows that above about 3% resource rents as a share of GDP, the effect of FDI contributes to states being predicted to be more corrupt as CPI scores fall below 45 point confidence bounds. While this plot does show that predicted CPI scores become less confident with higher resource rents, the confidence interval for all points is well below a CPI score of 45 after about 3% resource rents, so, the model estimates that for states with resource economies larger than about 3% of the overall economy, the effect of FDI leads to more corrupt predicted CPI scores. This shows that Model 4's interaction associates FDI as more negatively affecting corruption with increasing resource dependency, so states with dominant resource industries may, indeed, exploit FDI for corrupt purposes. Even at zero resource rents, Model 4 predicts that FDI will contribute to a predicted CPI score of about 42 points, but this is taking into account constant controls and baseline values, which may skew the prediction. In all, the FDI and resource rents interaction has uncovered enticing evidence that FDI contributes to more corruption in more resource-dependent states.

Of the three interactions, I believe that the FDI and resource rents interaction gives the most significant results, but each interaction has given important insights into how my hypothesized conditions affect FDI's impact on corruption: FDI and GDP yields an insignificant

interaction that predicts increased corruption with increased economic development; FDI and literacy creates a somewhat significant interaction that predicts increased corruption with FDI at high education; and FDI and resources made a significant interaction at lower values of resource rents that predicts increased corruption with FDI as resource dependency increases. These can give general implications for broad policy, but more specific circumstances may need to be examined to determine which specific factors most significantly influence FDI's effect on corruption.

Discussion and Conclusion

From the results, it is plain that there may be more specific conditional factors that may more significantly affect FDI's relationship with corruption, but the conditions I tested still revealed some intriguing trends. The marginal effect of FDI on corruption at different GDPs was totally insignificant, but the predicted values for that particular model show that the model expects increased corruption with increased GDP. I expected corruption to increase with decreasing GDP, so interestingly, the model has proved my conditional hypothesis regarding FDI's effect with GDP somewhat wrong. The marginal effect of FDI at different literacy rates only became significantly positive at very high literacy rates, but the predicted values plot shows that corruption is expected to increase around these levels. However, the confidence intervals for the predicted values only become slim at extremely high rates of literacy, so FDI's effect on corruption in states with low education is uncertain. Finally, the marginal effect of FDI became significantly positive at lower resource rents, and the predicted values plot shows that corruption is expected to fall at lower economic shares of resource rents. This interaction seems to be the most significant of the three, and while the predicted values of CPI scores at higher resource

rents (above ~35% of GDP), the confidence intervals in the predicted values chart remain within corrupt bounds and the plot shows increasing corruption with increased resource rents. With this, I conclude that FDI in states with higher resource dependency is more likely to increase corruption, and FDI in states with less of an economic dependency on resources is more likely to reduce corruption. While there is some doubtfulness to these models' predictions, these predictions still have massive implications for foreign direct investment policy.

First, corporations looking to send FDI somewhere should send it to states with lower economic development (less than ~24 log GDP), for FDI at higher GDPs is predicted to create corrupt situations whereas the effect of FDI on states with lower GDP is vague but may help to mitigate corrupt behavior. Second, MNCs should invest where there is less than exceptional education (less than ~98% literacy), for FDI directed towards countries with already high education is predicted to fuel further corruption. The effect of FDI on corruption in less educated states is unpredictable though, so investments should be made to less educated states as it may be more beneficial. This may be due to intelligent host countries' ease of exploiting FDI through corruption, but the cause of the change in certainty for predictions at different rates of education is unknown. Finally, foreign direct investment should be directed toward states with less of an economic dependency on resources, for my model's predicted values for corruption decrease with increasing resource rents. So, countries with a gross reliance on resources like oil, such as Kuwait, Iraq, Oman, Gabon, Azerbaijan, and Saudi Arabia, should be avoided when it comes to FDI as these countries' economic composition makes them more conducive to corrupt utilization of FDI. FDI may help boost technological innovation in developing countries, but where there are plentiful resources to extract for high returns, there may be little desire for technological

innovation and industrialization. So, in these circumstances, genuine efforts to effect growth may be shunned and instead abused for officials' enrichment.

In all, I was surprised to find that FDI could, in fact, have a positive effect on state corruption, for before, I thought that any flows of nearly free cash to states with more unruly practices would merely create corruption right away. However, I, and the readers, must understand that FDI is much more than a simple cash investment from one company to another state, for FDI makes material investments, like facilities, factories, and capital, that further employ host countries' citizens and spread technical knowledge throughout society. In states where such knowledge and industrialization are both needed and wanted, FDI will likely diminish corruption as it creates opportunities for genuine growth and economic success rather than promoting the spread of inefficient, exploitative, and wasteful rent seeking practices. In states with already high economic development, education, and resource riches, this may simply not be the case and so FDI leads to greater corruption. Unless corporations are actively seeking out mutually beneficial corruption, then greater attention to contextual details regarding development, economic diversity, and education could greatly increase FDI's ability to reduce corruption and create growth.

Annotated Bibliography

Barzelay, Adele, Anne Paschke, and John Baffes. "World Bank Open Data." *Open Data*, (December 2021). https://data.worldbank.org/.

"Corruption Perceptions Index." *Transparency.org*, https://www.transparency.org/en/cpi/2020/index/.

Larrain, Felipe, and Jose Tavares. "Does Foreign Direct Investment Decrease Corruption?" *Cuadernos de Economía* 41, no. 123 (August 2004): 217-230. https://scielo.conicyt.cl/scielo.php?pid=S0717-68212004012300003&script=sci_arttext&tlng=p.

Lindstedt, Catharina, and Daniel Naurin. "Transparency is Not Enough: Making Transparency Effective in Reducing Corruption." *International Political Science Review* 31, no. 3 (June 2010): 301-322. https://doi.org/10.1177/0192512110377602.

Melo, Luisa, and Michael Quinn. "Oil, Foreign Direct Investment, and Corruption." *The International Journal of Business and Finance Research* 9, no. 1 (2015): 33-49. https://www.theibfr.com/download/IJBFR/2015-ijbfr/ijbfr-v9n1-2015/IJBFR-V9N1-2015-3.pdf.

Pinto, Pablo, and Boliang Zhu. "Fortune or Evil? The Effect of Inward Foreign Direct Investment on Corruption." *International Studies Quarterly* 60, no. 4 (December 2016): 693-705. https://doi.org/10.1093/isq/sqw025.

Quazi, Rahim. "Corruption and Foreign Direct Investment in East Asia and South Asia: An Econometric Study." *International Journal of Economics and Financial Issues* 4, no. 2 (2014): 231-242.

https://www.researchgate.net/profile/Rahim-Quazi/publication/272564735_Corruption_and_Foreign_Direct_Investment_in_East_Asia_and_South_Asia_An_Econometric_Study/links/54e8de9e0cf2f7aa4d52e0d6/Corruption-and-Foreign-Direct-Investment-in-East-Asia-and-South-Asia-An-Econometric-Study.pdf.

Appendix

Table 1: Bivariate (1) and Multivariate (2) Models

	Dependent variable:	
	CPI Score	
	(1)	(2)
Log FDI	2.751***	2.561*
	(0.908)	(1.342)
Log GDP		−3.188**
		(1.409)
Log Electr		14.215***
		(1.705)
Literacy Rate		−0.500***
		(0.112)
Pop. Density		0.002**
		(0.001)
Resource Rents		−0.394***
		(0.090)
Constant	−19.788	6.658
	(19.717)	(16.857)
Observations	98	98
R^2	0.087	0.624
Adjusted R^2	0.078	0.599
Residual Std. Error	14.995 (df = 96)	9.890 (df = 91)
F Statistic	9.178*** (df = 1; 96)	25.127*** (df = 6; 91)

Note: All controls included. *p<0.1; **p<0.05; ***p<0.01

Table 2: Fixed Effects (1) and Added Interactions

	Dependent variable:			
	CPI Score			
	(1)	(2)	(3)	(4)
Log FDI	2.400*	3.017	−6.139	3.119**
	(1.324)	(10.560)	(7.161)	(1.439)
Log GDP	−2.961**	−2.436	−2.795*	−3.105**
	(1.433)	(9.042)	(1.436)	(1.433)
Log Electr	12.658***	12.681***	12.000***	12.289***
	(1.905)	(1.956)	(1.975)	(1.921)
Literacy Rate	−0.297**	−0.299**	−2.105	−0.283**
	(0.123)	(0.125)	(1.495)	(0.123)
Pop. Density	0.003**	0.003**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Resource Rents	−0.419***	−0.420***	−0.418***	1.626
	(0.098)	(0.101)	(0.098)	(1.632)
Asia-Pacific	−1.458	−1.504	−0.119	−1.398
	(4.094)	(4.193)	(4.229)	(4.080)
Europe-Central Asia	−6.147**	−6.144**	−6.357**	−5.558*
	(2.941)	(2.959)	(2.938)	(2.968)
Middle East-North Africa	4.661	4.609	6.035	5.599
	(4.191)	(4.308)	(4.330)	(4.243)
Sub Saharan Africa	8.511**	8.537**	7.814**	8.904**
	(3.378)	(3.427)	(3.417)	(3.381)
Western Europe	6.600	6.596	5.884	6.072
	(4.879)	(4.909)	(4.901)	(4.880)
2013	0.780	0.792	0.692	1.494
	(2.562)	(2.585)	(2.556)	(2.616)
2014	−2.008	−2.011	−1.707	−1.653
	(2.292)	(2.306)	(2.299)	(2.301)
2015	7.322	7.404	5.047	6.985
	(10.198)	(10.354)	(10.341)	(10.166)
Log FDI*Log GDP		−0.024		
		(0.408)		
Log FDI*Literacy Rate			0.090	
			(0.074)	
Log FDI*Resource Rents				−0.096
				(0.076)
Constant	−2.417	−15.904	169.841	−13.384
	(18.184)	(229.924)	(143.125)	(20.118)
Observations	98	98	98	98
R^2	0.701	0.701	0.706	0.707
Adjusted R^2	0.651	0.646	0.653	0.653
Residual Std. Error	9.231 (df = 83)	9.287 (df = 82)	9.204 (df = 82)	9.199 (df = 82)
F Statistic	13.897*** (df = 14; 83)	12.815*** (df = 15; 82)	13.143*** (df = 15; 82)	13.166*** (df = 15; 82)

Note: Americas region and 2012 are baselines. *p<0.1; **p<0.05; ***p<0.01

Figure 1: Frequency of Corruption Scores

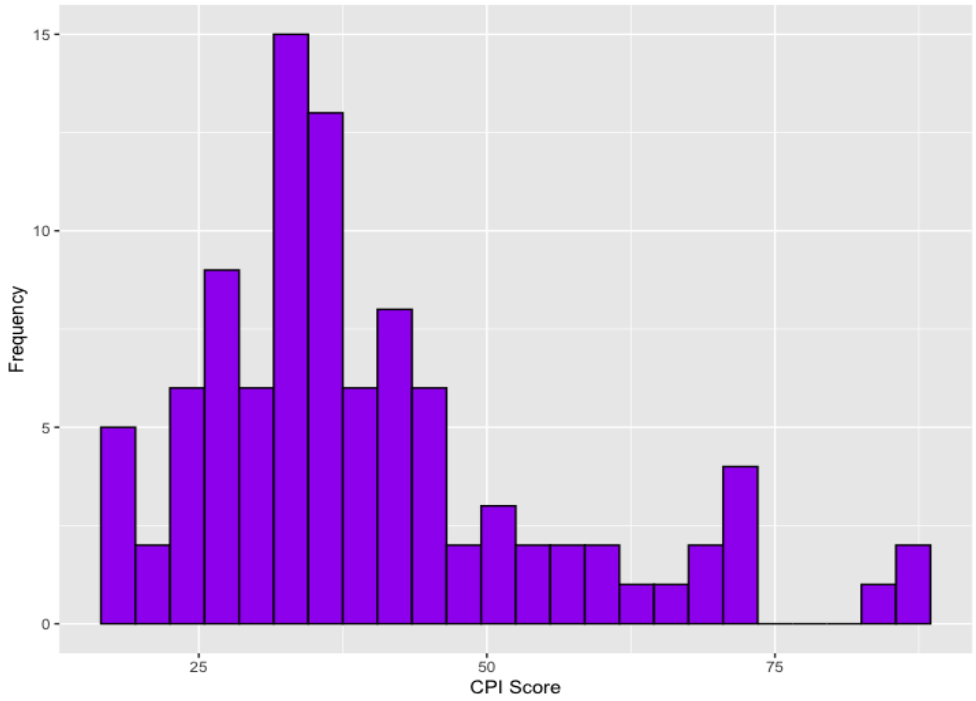

Figure 2: CPI Scores and FDI

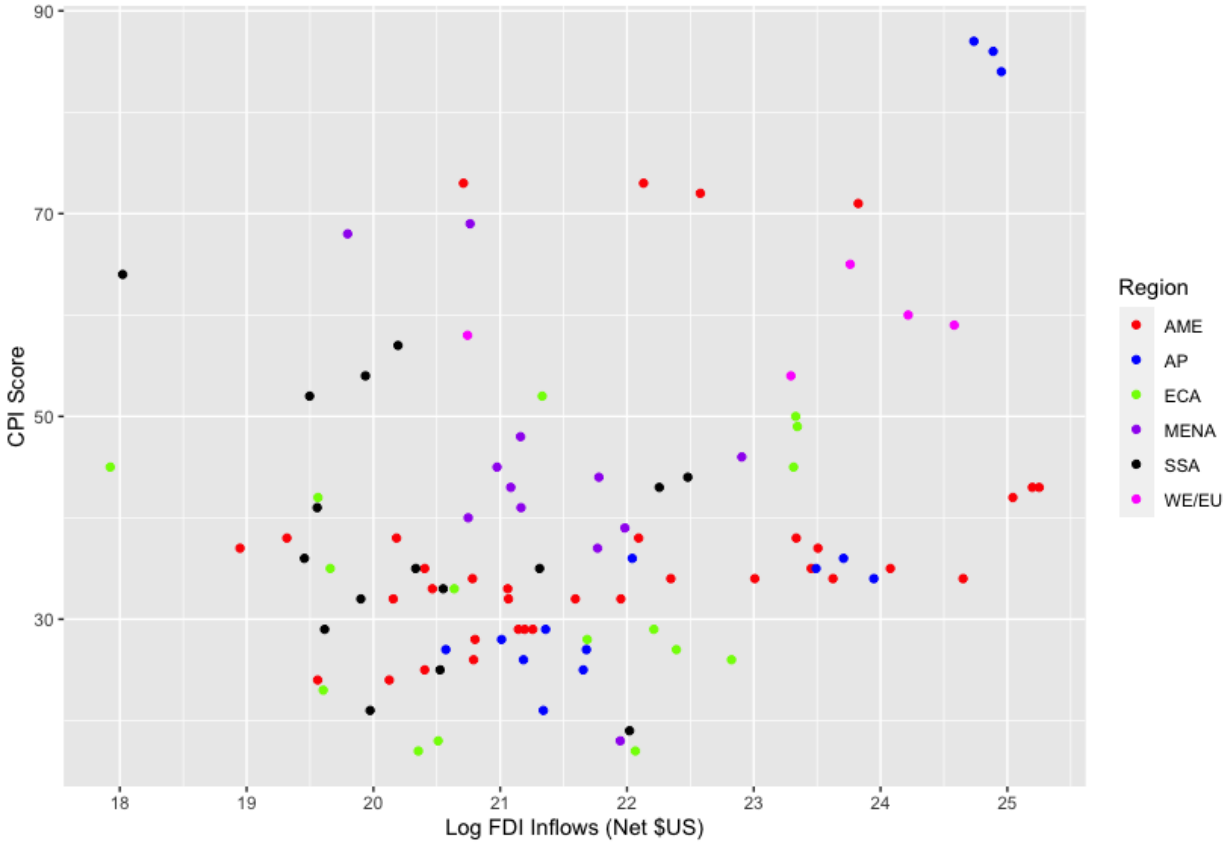

Figure 3: Average CPI Score by Region

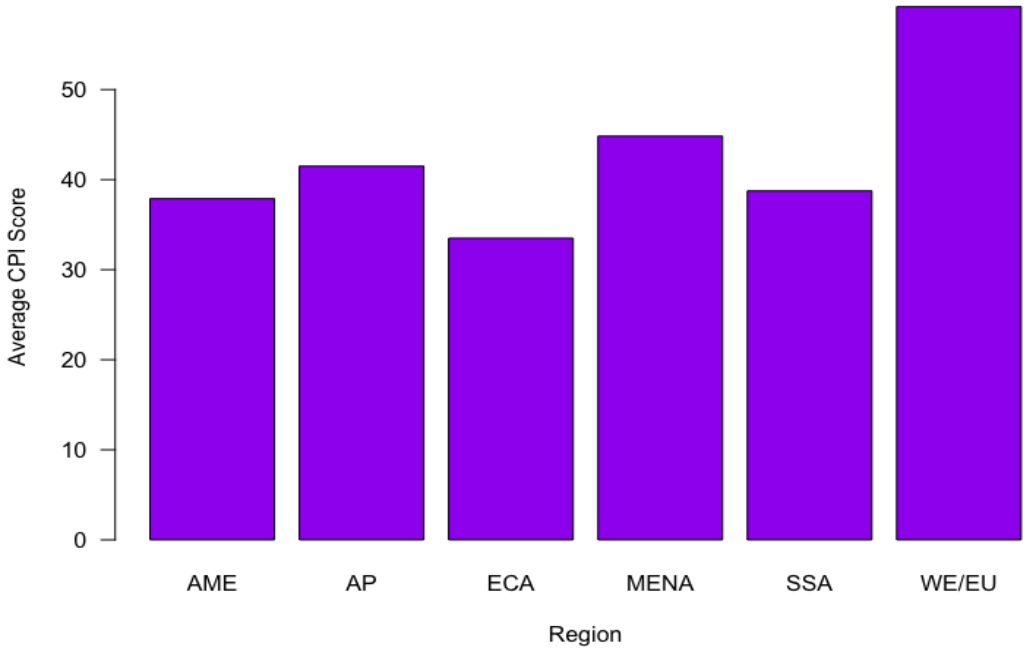

Figure 4: Average FDI by Region

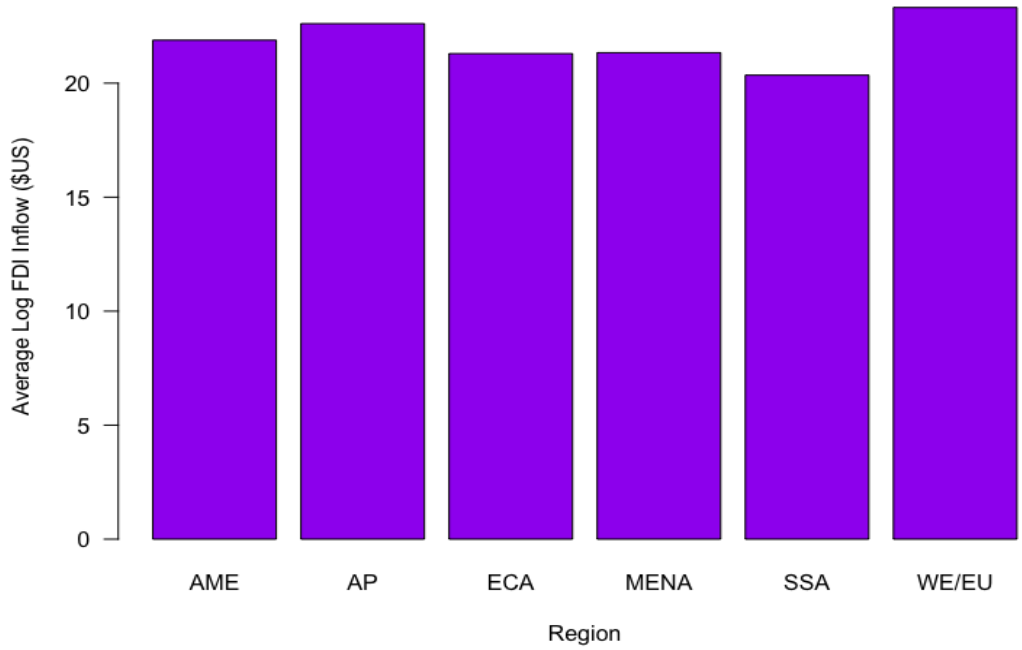

Figure 5: Resource Rents by Region

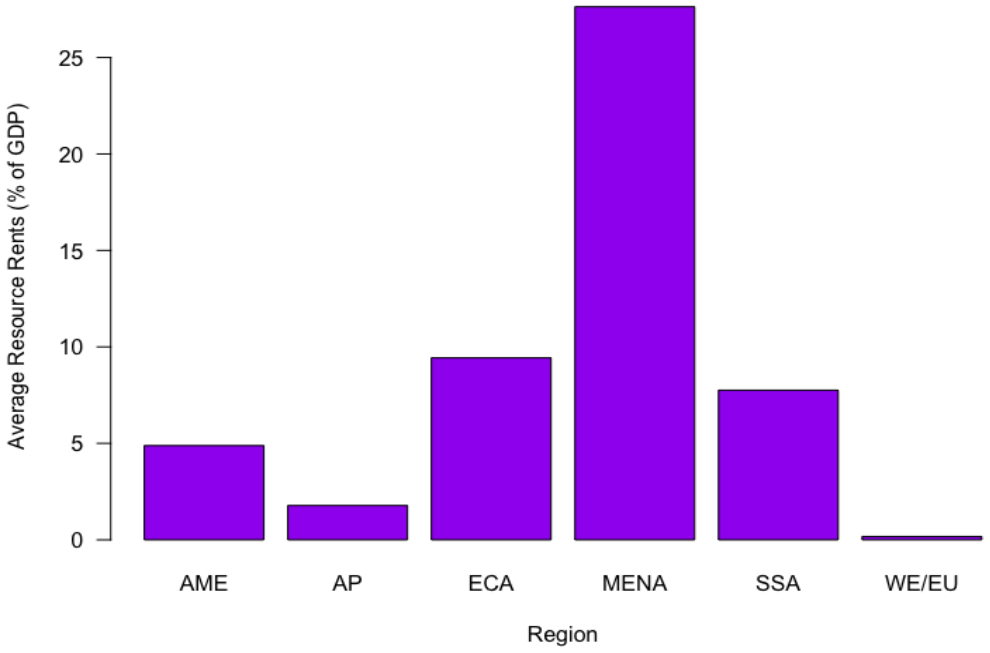

Figure 6: Marginal Effect of FDI*GDP

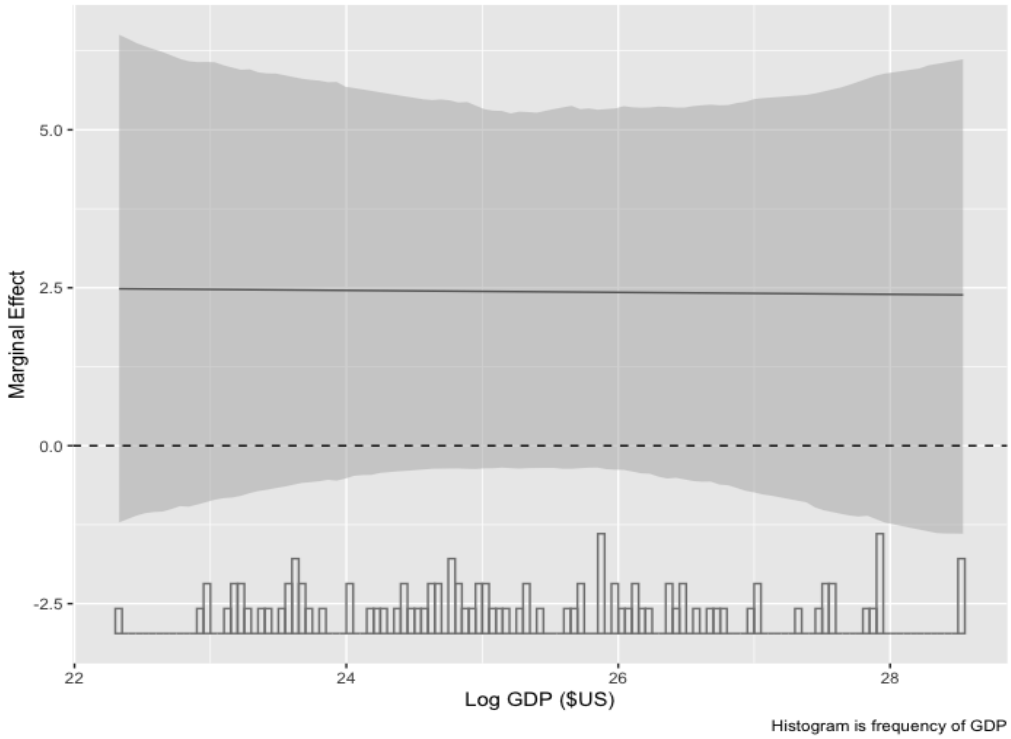

Figure 7: Predicted CPI Scores with FDI*GDP

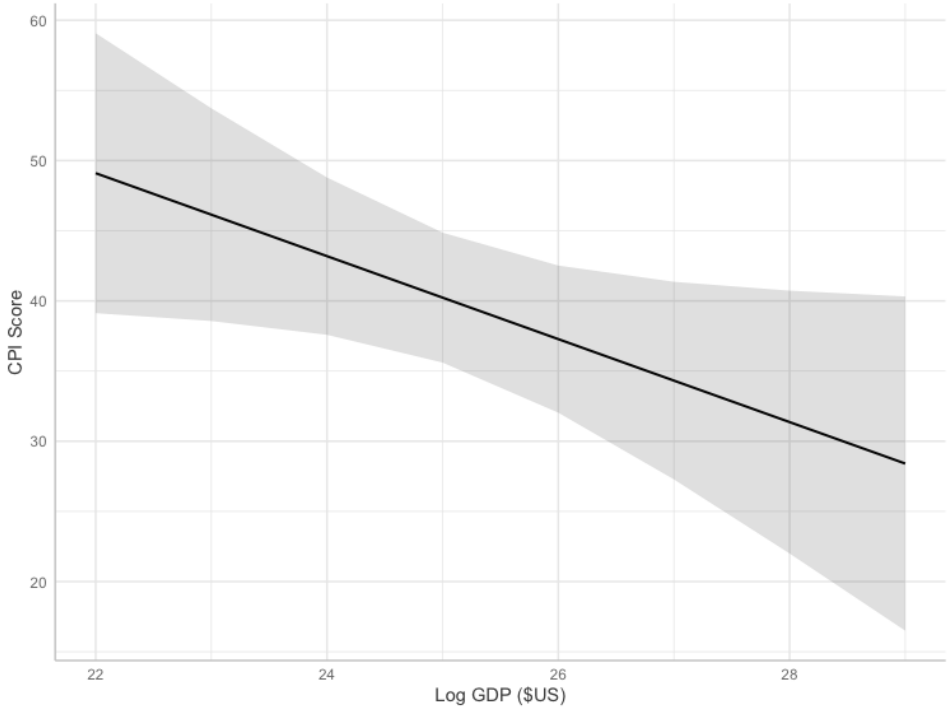

Figure 8: Marginal Effect of FDI*Literacy

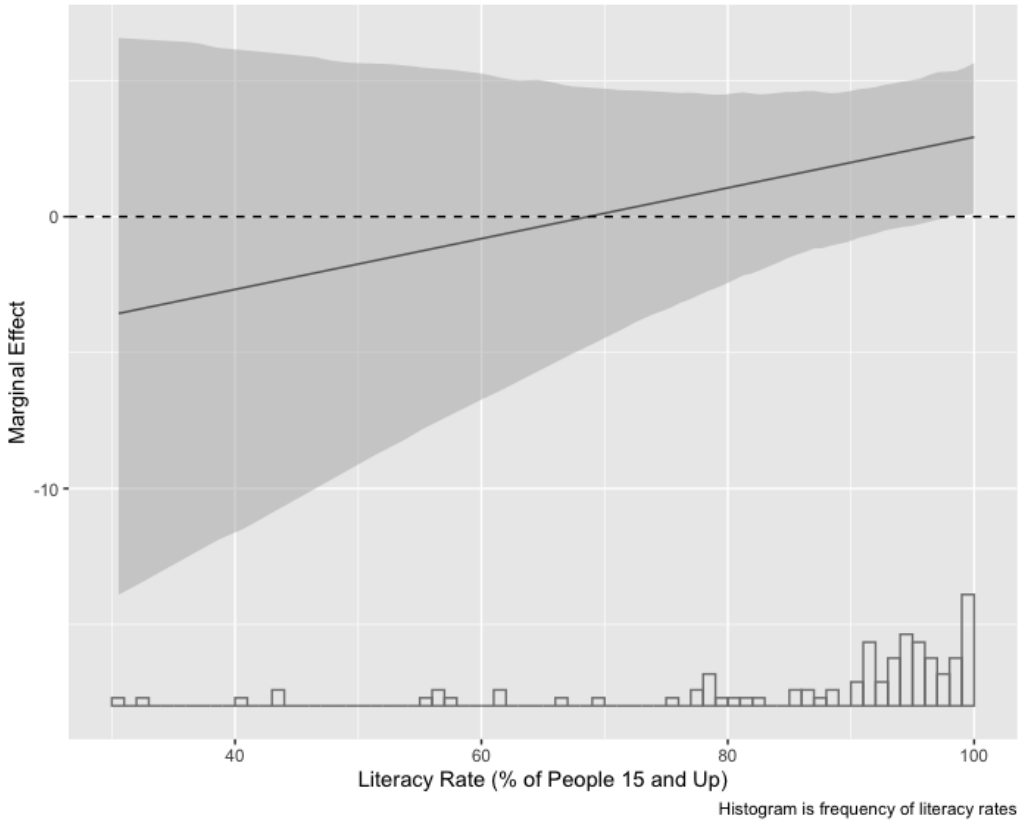

Figure 9: Predicted CPI Scores with FDI*Literacy

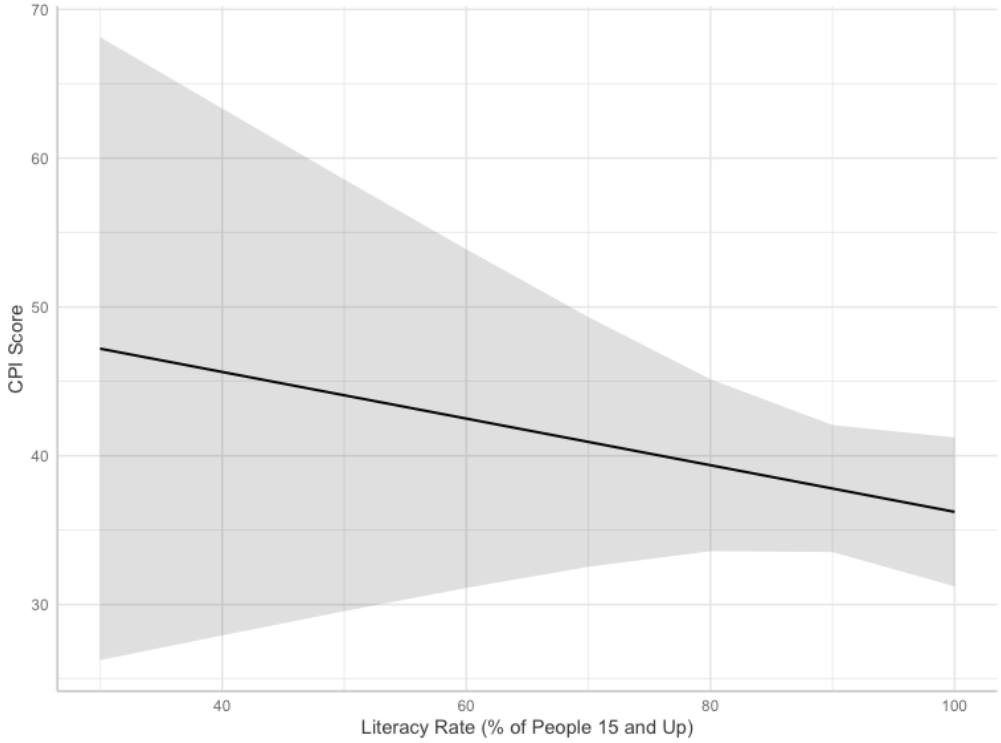

Figure 10: Marginal Effect of FDI*Resource Rents

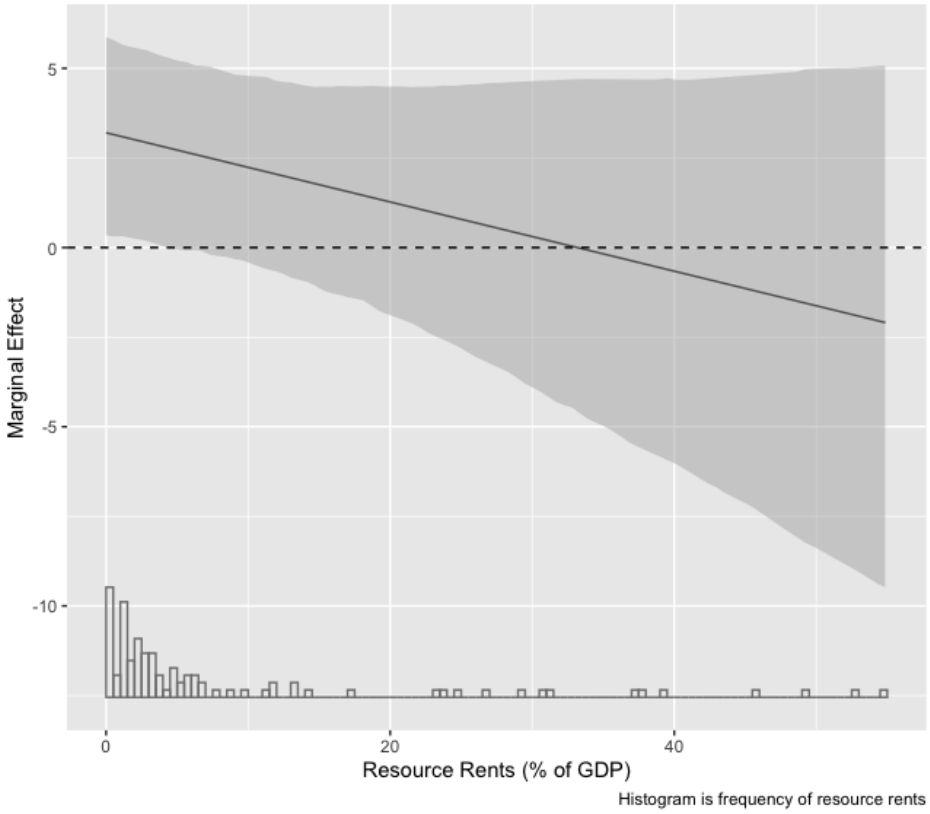

Figure 11: Predicted CPI Scores with FDI*Resource