

What Are Foreign Aid and Capital Investments Good For?

Inequality and Democratization in the Middle East

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Motivated by how to facilitate democratization in the Middle East, this paper examines how foreign aid and capital investments can impact inequality, which has demonstrated implications for democratic transitions. We conclude that 1) well-structured and multilaterally-implemented aid programs may act to reduce wealth and income inequality in the recipient countries and 2) capital investments, especially foreign direct investment, has little direct effect on inequality in the recipient countries, after controlling for other economic variables.

In light of post-9/11 world events and the rise of Islamic extremism, few topics in political science have as much relevance for peace and prosperity as the issue of democratization in the Middle East. According to the Freedom House Map of Freedom for 2009, Israel is the only country categorized as “free” in the Middle East and North Africa region. Moreover, out of the region’s 358 million people, 284 million, or around 80 percent, live under “not free” conditions. Globally, this percentage is only around 22. A number of arguments can be found in response to the question of why the Middle East has failed to democratize when so many other countries in Latin American, Eastern Europe, and Asia have in recent decades. One argument points to the historical developments of the region. Kuran (2004) made a compelling argument for the invisible hand of historical institutions – the Islamic law of inheritance, individualism in Islamic law, and waqf, an Islamic form of trust – in today’s undeniably underdeveloped Middle Eastern economies. In light of the correlation between income and democracy, first examined by Lipset (1959), historical institutions can be said

to have reduced the income-generating potential in the Middle East, consequently reducing the region’s ability to embrace democracy.¹ Another argument lies in the relationship between Islam and democracy. While Kuran focused on the impact of Islamic traditions and explicitly allowed for the possibility that Islam is not inherently anti-democracy, others are not so quick to conclude that Islam and democracy can go hand-in-hand. There is, however, growing evidence to support Kuran’s view. Tessler (2002) discovered in a post 9/11 study that even in an ideologically-charged atmosphere, individual attachments to Islam had little effect on their attitudes towards democracy. Yet another argument points to the importance of civil society in democratization. Kubba (2000) suggested that the Middle East has not democratized because a vibrant civil society is only now emerging. A fourth argument, offered by Bellin (2004), involves the presence and

¹ Though the correlation between income and democratization is widely supported by empirical data, scholars disagree over the exact relationship between income and democratization. In an empirical study, Londregan and Poole (1996) found that economic growth designed to enhance income has a less-than-desirable effect on democratization.

maintenance of strong coercive state apparatuses in many Arab states that are both willing and capable of suppressing democratic initiatives. Finally, in any social, economic, or political discussion on the Middle East, oil is always important. Smith (2004) found a robust relationship between oil wealth and increased regime durability, and lower likelihoods of civil war and anti-state protests. Hence, oil, like coercive state apparatus, can act as a deterrent of democratization.

In short, numerous arguments have been proposed in response to the question of why no democratization in the Middle East; many of them describe either why forces supporting democratization – such as a strong economy, compatible religious heritage, and vibrant civil society – are feeble or why forces sustaining current non-democracies – such as a coercive state apparatus and oil wealth – are alive and well. At the end of the day, there is no consensus and no indication of movement towards a consensus. A comprehensive argument that seeks to consolidate these individual arguments is lacking and understandably so in light of the complexities of democratization and of the social, cultural, and political climate of the Middle East in general. As a result, the region has become something of a black hole to be avoided in studies on democratization. In writing their seminal book *Economic Origins and of Dictatorship and Democracy*, Acemoglu and Robinson (2006) meticulously examined democratization in a representative country in every region of the world except the Middle East. Yet, if their approach of emphasizing the role of inter-group inequality can explain democratization in countries as diverse as Singapore, Britain, Argentina, and South Africa, why can't it also point the way towards democratization in the countries of the Middle East?

A central premise of this paper is that we do not have to fully and completely understand the issue of *why* the Middle East

hasn't already democratized in order to move forward on the issue of *how* to help the region democratize. While the two are inevitably linked, progress can nonetheless be made on the latter in the absence of a complete explanation of the former. In light of the considerable intellectual capital that has already been expended on the question of why no democratization, we feel that it would be at least prudent to explore the alternative and, arguably, more socially, politically, and economically pertinent issue of how to democratize. Towards this purpose, we extend Acemoglu and Robinsons' work on the relationship between inequality and democratization to the Middle East, and examine the impact of foreign capital investments and foreign aid going into a country on that country's wealth inequality. We focus on investments and aid because we are primarily interested in how foreign countries, notably wealthy and democratic ones, can peacefully facilitate democratization elsewhere, namely in the Middle East. In summary, the rest of this paper consists of (I) review of Acemoglu and Robinson's work to show that in theory, their analysis on inequality and democratization is universally applicable; (II) introduction of an inequality model that incorporates foreign capital investments and foreign aid; (III) analysis of a game tree within the model; (IV) empirical test of model predictions; and (V) discussion on the policy implications of our analysis and how our findings fit within the larger, mostly empirical, literature on foreign capital investments, foreign aid, and inequality. The concluding section relates our work on inequality back to democratization in the Middle East.

I. Review of Acemoglu and Robinson

Acemoglu and Robinson (2006) developed what has been considered by some to be the first systematic formal analysis of the creation of democracy. In their work, Acemoglu and Robinson considered a number of factors,

including inter-group inequality, political institutions, structure of the economy, and nature and extent of globalization. One of their main conclusions was that an inverse-U-shaped relationship exists between inequality and democracy, with democratization most likely to happen at intermediate levels of inequality. Acemoglu and Robinson explained the intuition behind this relationship by pointing to the consequences of various levels of inequality. Consider a nondemocratic country with two types of people, the rich with all the decision-making power and the poor with a majority in the population – call this the status quo. When inequality is low, the poor have little desire to challenge the rich, and so democratization does not occur. When inequality is high, the poor have a great desire to challenge the rich because should they succeed, they stand to expropriate all the rich's wealth, which would make them considerably better off. Correspondingly, when inequality is high, the rich have a great desire to use repression to maintain the status quo because should the poor overthrow them, they stand to lose a considerable amount of wealth. In other words, when inequality is high, the rich are more willing to repress and so democratization is unlikely to occur. In between extreme levels of inequality, the rich are more willing to make concessions rather than utilizing repression because they don't feel as threatened by democracy and because it costs them less to make concessions than to use repression. Acemoglu and Robinson saw these concessions as shifts of power from the rich to the poor, or democratization.

Hence, we see that Acemoglu and Robinson's explanation of the relationship between inequality and democratization is purely utility-based, which suggests that the relationship, assuming that it is valid, should be universally applicable.² This assumption of

validity, or even a correlation between inequality and democratization, is, however, open to debate. While others, including Dahl (1971) and Huntington (1991), before Acemoglu and Robinson have also proposed that democracy is unlikely in highly unequal societies, empirical evidence suggests that the relationship between inequality and democratization is not straightforward. Using cross-sectional data, Bollen and Jackman (1985) found no relationship between inequality and democracy. Using probit analysis, Przeworski et al. (2000) looked at three measures of inequality – Gini coefficient, ratio between the share of total income going to the richest 10 percent and the share going to the poorest 10 percent, and share of income produced by manufacturing that accrues to workers – and found no relationship between the first two measures of inequality and democracy. For the third measure, they actually found that dictatorships are more vulnerable, i.e. that democracy is more likely, when the distribution of income becomes more unequal.

Our paper builds on Acemoglu and Robinson's inverse-U-shaped relationship between inequality and democracy, and so includes an implicit acceptance of this relationship. In fact, it serves as the link between inequality, the target of our model below, and democratization, the focus of our paper. Empirical evidence, while important, can only show that inequality hasn't been strongly correlated with democracy, not that it cannot impact democratization. Moreover, if democracy is considered to be a forum in which all citizens have a voice, then it is intuitively incompatible with high inequality because under high inequality, a significant number of citizens will have complaints and the very

² The relationship is universally applicable to the extent that people make their decisions on the basis of expected utility. We acknowledge that there are a number of

criticisms of the expected utility theory and that people in some cultures may be more likely to base their decisions on ideology and/or other social factors. These, however, shouldn't prevent us from making the reasonable assumption that expected utility is, on average, a good foundation for decision-making.

nature of democracy suggests that something will be done about the high inequality.

II. Inequality Model

To the extent that Acemoglu and Robinson considered exogenous influences on inequality, they only examined globalization's effects on factor prices and hence income levels and inequality. Clearly, a foreign country, under normal conditions, cannot be expected to have control over factor prices, which are generally determined by global markets. A foreign country, and/or its citizens, can, however, control how much capital to invest in and how much aid to supply to a given country. Both of these, in turn, can impact inequality. Foreign capital investments may affect patterns of economic activities and, by extension, inequality. Aid money, often motivated by concerns over national security and/or support for a particular ideology, may also influence inequality by either providing otherwise absent public goods or padding the bank accounts of corrupt elites.³ Accordingly, we set up the model in *Figure 1* to examine how foreign capital investments and aid may affect inequality in a given country.

X is a nondemocratic country made up of two types of people, the elites and the commoners.⁴ The elites control all the income in X and hold all the decision-making power, including the power to set θ or the fraction of total income accruing to the elites. The commoners have no power and are at the mercy of the elites. Whatever income share the commoners have is hence the result of the elites, for reasons we will examine shortly, setting θ to be less than one. It is perhaps useful to note that we are not concerned with how the elites acquired power

or how the commoners came to be at the mercy of the elites. Nor do we, at this point, make any assumption on characteristics other than the wielding of power just noted and the population composition. Let δ denote the population fraction of the elites. We assume that δ is less than half, i.e. the elites form the minority group and the commoners the majority group in X.⁵ Let U^i , $i \in \{e, c\}$, denote each type's utility and y^i , $i \in \{e, c\}$, each type's income. There is no redistribution on the basis of taxation, so utility for each type equals that type's income, which in turn depends on θ , along with variables that we will introduce shortly.⁶

Y is a democratic country made up of three types of people – the public servants, the private investors, and the citizens. The public servants represent Y's government and are voted into office by majoritarian elections with universal suffrage.

The hollow arrows in *Figure 1* summarize both intra-country relationships and cross-border interactions. Because the commoners have no power to influence the elites, there is a single-headed hollow arrow going from the elites to the commoners. Y, contrary to X, is a democracy and so its people are able to influence its government, hence the double-headed arrows amongst the private investors, public servants, and citizens. The figure also describes how cross-border interactions take place, namely via the following:

- K or capital investments are supplied by the private investors in Y to X, with the stipulation that they go towards particular productive uses.

³ The importance of security concerns can be seen in the twentieth century waves of democratization. Boix (2003) showed that the waves correspond to events like the end of World War I and II and the Cold War which fundamentally altered international politics and aid-giving.

⁴ Though there are many individuals who fall under each type, we model each type by a representative individual.

⁵ X is a non-democracy and in a non-democracy, overwhelming power is held by either a single person or a small group.

⁶ We justify the lack of redistribution in our model by the fact that many countries in the Middle East are rentier states – countries that derive more revenue from non-tax-based sources than is the norm in developed countries.

- A or aid money is given by Y 's government to X (either directly or via an international organization), perhaps for national security and/or ideological and/or humanitarian reasons.

These cross-border interactions are enclosed in double-headed hollow arrows to reflect the fact that though they originate with the private investors and public servants in Y , they can be influenced by the elites in X . For example, the elites may do something to upset the public servants, who may then reduce or even terminate aid.

In a notational borrowing from Myerson (2009), we denote X 's endogenous productive resources by F and the net production flow per unit of time associated with F by the function $Y(\bullet)$.⁷ In exchange for rK , where r represents an internationally-acceptable return to capital, the private investors supply capital K . For simplicity, we assume that the following all happen within a given time period – K flowing into X , X producing $Y(F+K)$, rK flowing out of X . Hence, this leaves the elites in X with revenue $Y(F+K) - rK$.⁸ For further simplicity, we assume that $Y(F+K) - rK$ represents the total, non-aid-based revenue in X , of which the elites choose to keep a fraction θ .

In recognition of the fact that foreign aid rarely comes with no strings attached, we introduce the parameter β to account for the level of restrictions associated with A . We think of these restrictions as proxies for aid quality; more restrictions suggest detailed agreements on how aid is to be used, which in turn suggest a well thought-out aid scheme, i.e. higher aid quality. β is bound by zero and one, and $1 - \beta$ denotes the fraction of A that

the elites may keep for themselves. Hence, an increase in β , or additional restrictions, lead to less utility for the elites.

As previously noted, utility equals income in X and income can come from both endogenous production incorporating foreign capital investments and from aid. The preceding two paragraphs imply that

$$(1) \quad U^e = y^e = \frac{\theta}{\delta} [Y(F+K) - rK] + \frac{1-\beta}{\delta} A$$

$$U^c = y^c = \frac{1-\theta}{1-\delta} [Y(F+K) - rK] + \frac{\beta}{1-\delta} A$$

The elites get θ of $Y(F+K) - rK$ and $1 - \beta$ of A , and split this sum amongst all members,

δ .⁹ The commoners are then left with $1 - \theta$ of $Y(F+K) - rK$ and β of A , which is also split equally amongst all members, $1 - \delta$.

Table 1 summarizes all the variables introduced up to this point and organizes them by the controlling or supplying party.

The goal of our model is to examine the effect of foreign capital investments and aid on inequality in the receiving country, in our case, country X . While we have introduced θ to denote the fraction of total non-aid-based income in X going to the elites, we now propose to also use it as our measure for inequality in X . In our model, the population composition in X is fixed, i.e. δ is exogenous and constant. Hence, an increase in θ corresponds to an increase in inequality because a fixed number of elites will then receive a greater share of total income in X . Under the presumption of equal intra-group resource allocation, this will make all the elites better off. At the same time,

⁷ $Y(\bullet)$ is nonnegative, differentiable, and strictly concave.

⁸ We assume that $Y(F+K) - Y(F) \geq rK$, i.e. the benefit of K exceeds its cost.

⁹ δ , by definition, is greater than 0 and less than 1 because it denotes the population fraction of one of two groups. Hence, the expressions in (1) are valid.

it will reduce the welfare of all the commoners, because, as a group, they will now have a smaller share of total income in X. Clearly, an increase in θ benefits the elites at the expense of the commoners and this suggests that θ can be interpreted as a measure of inequality.

III. Game Analysis

We now determine, via game theory, how foreign capital investments and aid may affect inequality and, by extension, societal transitions. Our starting point is the game tree outlined in *Figure 2*.

We allow for two states of the world, the change-state and the no-change-state, denoted respectively by subscript c and n . The elites move first and set θ . The commoners then decide whether to accept θ . With acceptance, the n -state occurs and utilities (U_n^e, U_n^c) are realized. With rejection, the c -state occurs and utilities (U_c^e, U_c^c) are realized. In the n -state, the elites retain full power, namely the power to set θ . (U_n^e, U_n^c) is given by (2), which adds subscripts to (1) to denote the n -state and omits the now-unnecessary intermediate y^i , $i \in \{e, c\}$.

$$(2) \quad U_n^e = \frac{\theta}{\delta} [Y(F + K) - rK] + \frac{1 - \beta}{\delta} A$$

$$U_n^c = \frac{1 - \theta}{1 - \delta} [Y(F + K) - rK] + \frac{\beta}{1 - \delta} A$$

In the c -state, the elites are overthrown by the commoners and so lose the power to set θ to the commoners. We assume that the commoners are able to mobilize as a group, i.e. there is no collective action problem, and that should they so desire, they can bring about the c -state. Furthermore, we assume that should the commoners win power, θ will be set to zero, i.e. they will keep everything and leave nothing for the elites. All other variables in

Table 1 are state-invariant, i.e. constants, because our game is only between the elites and the commoners. Following common convention in political economy game-theory models, we assume that a fraction λ of all productive resources, F and K , is lost in the process of realizing the c -state (Persson and Tabellini 2000). The motivation for λ is that power transfers rarely happen peacefully. For the c -state to occur, a struggle involving destruction of productive resources may have to take place first. This destructive process reduces the commoners' incentive for change, as it reduces net production and so makes the total income in the c -state less than the total income in the n -state, which observes no such destruction. Lastly, because the commoners are in charge in the c -state, we assume that they, like the elites before them, abide by the aid restrictions, i.e. $1 - \beta$ denotes the fraction of A that the commoners may keep for themselves. (U_c^e, U_c^c) is given by (3).¹⁰

$$(3) \quad U_c^e = \frac{\beta}{\delta} A$$

$$U_c^c = \frac{1}{1 - \delta} [Y((1 - \lambda)(F + K)) - r(1 - \lambda)K] + \frac{1 - \beta}{1 - \delta} A$$

Before we proceed any further, we must describe how this game relates to democratization and what we seek from it. To begin, we note that there are two ways for X to become more democratic. It can become more democratic by either transitioning to the c -state or staying in the n -state. The c -state will move country X closer to democracy even though the commoners may become the new "dictators" because the number of people with

¹⁰ (3) implicitly assumes that the private investors in Y do not object to losing invested capital in a potential transitional process in X. In other words, they will accept a payment of $r(1 - \lambda)K$ instead of rK in the c -state, perhaps because they are sympathetic towards the commoners' cause.

substantial power, namely a say in their own welfare, will have increased.¹¹ X can also become more democratic by staying in the n -state if there is a mechanism that can guide inequality in the n -state into the intermediate range described by Acemoglu and Robinson as being the most conducive to democratization. We model true democratization as this second case for two reasons. The first reason is that while transitioning to the c -state will represent a move towards democracy, it will not represent a complete democratization process because the old elites will have become the new commoners and X will continue to have a “superior” and an “inferior” group. Furthermore, it will also leave open the possibility of a reversal transition and hence retribution by the old elites. The second reason is that transitioning to the c -state will be a sudden affair that may entail considerable violence and destruction. Staying in the n -state, on the other hand, will allow people in country X to slowly and gradually adjust themselves to greater democracy. The experiences of Western Europe for the last several hundred years suggest that democratization thus acquired is the most likely to endure. Hence, we define solving the game in *Figure 2* as finding conditions under which the n -state will prevail and conditions under which inequality can be adjusted in the n -state.

We proceed by comparing the commoners’ state-dependent utilities, U_n^c and U_c^c . The commoners prefer the n -state if and only if $U_n^c \geq U_c^c$.¹² From comparing the elites’ state-dependent utilities, U_n^e and U_c^e , we derive another condition for θ . The elites prefer the n -state if and only if $U_n^e \geq U_c^e$. Putting these two conditions together, we have

that for the n -state to persist, the following must be true.¹³

(4)

$$\frac{[Y(F+K) - Y((1-\lambda)(F+K))] - r\lambda K}{[Y(F+K) - rK]} + \frac{(2\beta-1)A}{[Y(F+K) - rK]} \geq \theta \geq \frac{(2\beta-1)A}{[Y(F+K) - rK]}$$

While (4) gives a range of values for θ , we can narrow down the possibilities by considering what must be true in equilibrium in the n -state. Assuming that $U_n^e \geq U_c^e$ holds, the elites prefer the n -state. To maintain the n -state, they offer a value of θ that is compatible with the commoners’ preference for the n -state, namely the value that satisfies $U_n^c = U_c^c$ but no greater than one. If the elites set θ to be any higher, the commoners would rally together to bring down the elites because their utilities would be higher in the c -state relative to the n -state; if the elites set θ to be any lower, the commoners would receive additional utility at the expense of the elites’. The latter would clearly not give the former more resources than the minimum required to keep them obedient. Thus, we have that for the n -state to prevail, the following ought to hold.

(4)

$$\min\left\{\frac{[Y(F+K) - Y((1-\lambda)(F+K))] - r\lambda K}{[Y(F+K) - rK]} + \frac{(2\beta-1)A}{[Y(F+K) - rK]}, 1\right\} = \theta$$

This expression gives our model’s formulation for inequality in a country with persistent authoritarianism and shows how foreign investments and aid may impact this inequality gradually over time, without suddenly pushing this non-democratic country towards change or revolution.

Since there is no such thing as perfect inequality, just as there is no such thing as perfect equality, we focus our attention on the

¹¹ By assumption, the commoners form a majority in X.

¹² We assume that actors default to the status quo, i.e. the n -state, should they expect equal utilities under the n -state and the c -state.

¹³ See *Appendix A* for mathematical derivations.

algebraic portion of (5).¹⁴ In light of $Y(\bullet)$'s concavity, we predict that $Y(F + K) - Y((1 - \lambda)(F + K))$, and hence θ , decreases as K increases.¹⁵ Our intuition for this relationship is that investments by foreigners will increase an authoritarian country's interaction with the global economy and so lead to greater awareness of, and potential support for, Western ideals in that country. We hypothesize that these ideals will support inequality reduction because of their emphasis on individual rights and liberties. Furthermore, investments may enhance economic growth in the authoritarian country, to the effect of inequality reduction in the medium to long-run. In the short-run, economic growth will increase total national wealth and perhaps even increase inequality as this growth may benefit those in power disproportionately. As time goes on, however, the masses may demand concessions, amounting to inequality reduction, which the elites may find difficult to refuse.

Furthermore, (5) predicts that with sufficient and proper aid restrictions, which will make $2\beta - 1$ positive, inequality decreases as aid decreases.¹⁶ In other words, an effective inequality-targeting aid strategy doesn't have to be costly to the donor; it merely needs to be well-formulated. The best intuition for this is perhaps the time-attested wisdom in "quality over quantity." Without sufficient and proper aid restrictions, $2\beta - 1$ is negative, and inequality decreases as aid increases.

¹⁴ According to the International Monetary Fund (2007), Gini measures typically range from 0.20 to 0.65.

¹⁵ $Y(\bullet)$'s concavity is visually illustrated in *Figure 3*.

¹⁶ For the purpose of this paper, we ignore the trivial cases where $2\beta - 1$ is zero and/or A is zero. If a country/organization is not already providing aid, then they are excluded from our model, which studies how existing donors may use aid to make long-term, beneficial social impacts. If a country/organization is already providing aid, then suddenly reducing that to zero represents an action that may destabilize relations and reduce the donor's ability to make meaningful long-term impacts, which is also not the purpose of our model.

Interestingly then, our model suggests that donors can substitute aid quantity for aid quality.

In summary, we have derived two sets of predictions.

- A.
 - i. Inequality decreases as investment increases.
- B.
 - i. In the presence of sufficient and proper aid restrictions, inequality decreases as aid decreases.
 - ii. In the absence of sufficient and proper aid restrictions, inequality decreases as aid increases.

Finally, no theoretical analysis is complete without suggestions for improvements. We have been rather cavalier in our assumptions and clearly, our predictions may not be valid if one or more of our assumptions are violated. For instance, we assumed a constant population composition, as denoted by δ , in the authoritarian country X. Though perhaps justifiable by relatively less physical freedom in a non-democracy, this assumption is still very difficult to defend because defending it amounts to arguing that a country in the 21st century can maintain a constant rich-poor ratio for a long time, which hardly seems likely. After all, many factors, including different birth rates and unbalanced immigration and emigration, will cause this ratio to change. Furthermore, we also assumed that there is no taxation-driven redistribution in country X. While many scholars, including Luciani (1987), have noted the lesser role accorded to direct taxes on economic activities, e.g. income taxes, in authoritarian countries, indirect and business taxes, e.g. oil taxes, sometimes provide significant government

revenues. Hence, completely ignoring taxation in our model is clearly less than ideal. In short, for further studies, we would suggest reconfiguring our model to allow for 1) a dynamic population and 2) government revenues from taxation.

IV. Empirical Work

Data

To test our theoretical predictions, we sought a balanced panel dataset with observations on 91 developing countries from 1980 to 2007. However, the limited availability of inequality, i.e. Gini, data forced us to scale down the size of our dataset to 79 countries and to settle for an unbalanced panel dataset with observations from 1980 to 2007.¹⁷ Our variables are Gini Index, bilateral aid, multilateral aid, investment, corruption, economic freedom, population, GDP, inflation, savings, trade, and energy production.¹⁸

In deciding what variables to include in our dataset, we considered what factors may be related to both inequality and one or more of our main independent variables – aid and investment – and how countries may differ from one another. As social indicators, corruption and individual freedom are obvious candidates. Corruption in particular has been shown to have some effect on the effectiveness of foreign aid in reducing income inequality (Chong et al. 2009). Population size is also important in that rapid population increases can lead to greater inequality because poor people tend to have more children and so expand their numbers faster than their resources. Finally, we included GDP, inflation, savings, trade, and energy production variables on the basis of earlier empirical work done in

this area (Bornschiefer et al. 1978; Chong et al. 2009).

We have two Gini variables, one from the World Bank Group's World Development Indicators (WDI) and one from the United Nations University-World Institute for Development Economics Research (UNU-WIDER).¹⁹ Bilateral aid, multilateral aid, and investment data come from SourceOECD International Development Statistics, which contains comprehensive data on the volume, origin, and types of aid, recipient indicators, and other resource flows from donor countries and donor organizations to countries on the OECD Development Assistance Committee (DAC) aid recipients list. Our corruption variable is based on the Political Risk Rating of the International Country Risk Guide (ICRG). We use the overall score from the Index of Economic Freedom to control for ten dimensions of freedom.²⁰ Population, GDP, inflation, savings, trade, and energy production data also come from the WDI. *Table 3* gives the full list of variables and their regression abbreviations, definitions, and sources.

Methodology

We test our theoretical predictions by running fixed-effect and random-effect regressions on our panel dataset.²¹ Altogether, we run 36 regressions, which correspond to various combinations of base specifications with a combination of social indicators, economic indicators, and interaction variables. Furthermore, some of the regressions are by country whereas others are by region (more details below). For each regression, we choose

¹⁷ See *Table 2* for countries and years included in our dataset.

¹⁸ Though the scope of our theoretical analysis was foreign capital investments, for practical reasons, our empirical investment variable encompasses only a component of foreign capital investments, namely foreign direct investments.

¹⁹ The two Gini measures do not cover the same countries over the same years. See *Table 2* for details.

²⁰ The ten dimensions of freedom are Business Freedom, Trade Freedom, Fiscal Freedom, Government Spending, Monetary Freedom, Investment Freedom, Financial Freedom, Property Rights, Freedom from Corruption, and Labor Freedom.

²¹ Though our focus is on countries in the Middle East, we cannot run regressions on just Middle Eastern countries because we don't have sufficient observations for this subgroup.

between fixed and random effect models via Hausman testing.²² We maintain the distinction between our two Gini variables as different sources may have different methods for calculating Gini coefficients. We also maintain the distinction between bilateral aid and multilateral aid because contained in this distinction may be a difference in aid restrictions. Given that it would be incredibly difficult to find direct data on aid restrictions, we devised this improvisation to indirectly test our theoretical predictions related to aid restrictions. We hypothesize that bilateral aid has more restrictions because it entails one-on-one negotiations that make it easier for donors to stipulate and to enforce conditions. Consequently, and in accordance with our theoretical predictions, we expect inequality to be positively correlated with bilateral aid and negatively correlated with multilateral aid. The shortcoming of this improvised method is that even if we do observe a different relationship between multilateral aid and inequality, and bilateral aid and inequality, we can still only conclude that the difference *might* have been caused by unobserved differences in aid restrictions. Clearly, bilateral aid and multilateral aid may differ on many accounts. For instance, multilateral organizations may be less motivated by country-specific agendas and so more likely to premise aid on socioeconomic factors; they may also have better aid administration and accountability systems than individual countries.

Regressions (1) – (24) use fixed or random effect models, as dictated by the Hausman test, and are by country. In other words, variations come from within countries.

²² For each combination of base specifications and/or social and/or economic indicators, we have two regressions, which correspond to our two Gini variables. If the Hausman test rejects random effect for one of the regressions, but not the other, then we use fixed effect models for both regressions. We do this because the set of independent variables included is the same and though the dependent variables are different, what they measure are nonetheless the same. Consequently, the regression model used should be consistent across each pair of regressions.

Their exact specifications, organized by the main independent variables, are given in *Appendix B* and their outcomes are given in *Table 6–8*.

Regressions (25) – (30) use fixed or random effect models, as dictated by the Hausman test, and are by region (more details below). In other words, variations come from within regions. Their exact specifications, organized by the main independent variables, are also given in *Appendix B* and their outcomes are given in *Table 10*. Note that we only run the full-specification regressions for our by-region dataset, as these appear the most promising from the by-country analysis.

The by-region regressions are motivated by the unbalanced nature of our full dataset. It represents our effort to obtain cleaner results by regrouping data. In preparation for these regressions, we eliminated all data points with missing values for any of the empirical variables. We then grouped all remaining data points according to geographical location. The pool of remaining data points compelled us to use only three broad regional categories – South America (including Central America and the Caribbean), Asia (including the Middle East), and Africa.

Regressions (31) – (36) extend Regressions (25) – (30) by adding three interaction variables. These interaction variables are made up of the main independent variable (bilateral aid, multilateral aid, or investment) and energy production, main independent variable and corruption, and main independent variable and economic freedom. We include these interaction variables to investigate whether the impact of aid or investment on inequality varies according to conditions embodied by energy production, corruption, and economic freedom. Furthermore, we include interaction variables for the by-region regressions, and not for the by-country regressions, because there are more observations within each region than there are

within each country, and we need the variation provided by large groups to econometrically justify including more variables. The regression outcomes are given in *Table 11*.

Summary of Findings

Table 4 gives a numerical summary of our empirical variables. The unbalanced nature of our full dataset is immediately and painfully noticeable. As previously noted, our dataset is unbalanced because we had tremendous difficulty with finding inequality data. Our task was complicated by the fact that we are interested in inequality in non-democratic, i.e. developing, countries whose leaders often have little incentive to collect income data and/or make them publicly available. Furthermore, even in developed countries, inequality data are rarely available on a yearly basis, as most countries don't conduct census, the source of data needed for Gini calculations, on a yearly basis. Something else that is immediately obvious from *Table 4* relates to our decision to maintain the distinction between our two sources of Gini data and the distinction between bilateral aid and multilateral aid. There are clearly differences between Gini (WDI) and Gini (UNU), and between bilateral aid and multilateral aid. Relative to Gini (WDI), Gini (UNU) is more readily available and has a noticeably larger range, though this may be due to differences in data coverage. The distinction between bilateral aid and multilateral aid is also striking – bilateral aid appears to have a much larger range than multilateral aid. It is perhaps useful to point out that both aid measures and investment can take on negative values because they record the net flow between donor and recipient. The fact that all three have positive means indicates that on average, money is flowing in the direction that we would expect, which is into the developing countries in our dataset. As for the remaining variables in *Table 4*, it is worthwhile noting that there are significant

variations in all of them, as indicated by tremendous ranges.

We create scatter plots of combinations of inequality, aid, and investment to begin analyzing our data. In *Figure 4*, we plot bilateral aid vs. Gini (WDI) and bilateral aid vs. Gini (UNU) for all recipient countries and for countries in our dataset that are in the MENA (Middle East and North America) region, which is the focus of our paper.²³ The scatter patterns suggest a negative relationship between bilateral aid and inequality. This contradicts our empirical hypothesis of a positive relationship between the two. One likely explanation is that bilateral aid doesn't have the level of restrictions that we envisioned, in which case our theoretical model suggests that as aid increases, inequality will decrease. Indeed, this is what we observe from the scatter plots.

In *Figure 5*, we plot multilateral aid vs. Gini (WDI) and multilateral vs. Gini (UNU) for all recipient countries and for MENA countries. In comparing *Figure 4* and *Figure 5*, we note that whereas the scatter patterns for multilateral aid and inequality resemble the scatter patterns for bilateral aid and inequality, the relationship between multilateral aid and inequality is stronger due to the scale of the plots. If the multilateral plots were to appear with the same domain as the bilateral plots, then the downward trend suggested by the data points would be steeper. On the one hand, this seems to confirm our hypothesis of a distinction between bilateral aid and multilateral aid. On the other hand, the distinction is not what we envisioned, as bilateral aid, like multilateral aid, is negatively

²³ MENA Countries, as defined by the World Bank, are **Algeria**, Bahrain, **Djibouti**, **Egypt**, **Iran**, **Iraq**, Israel, **Jordan**, Kuwait, Lebanon, Libya, Malta, **Morocco**, Oman, Qatar, Saudi Arabia, Syria, **Tunisia**, United Arab Emirates, West Bank and Gaza, and **Yemen**. Our dataset includes observations on the MENA countries highlighted in bold above.
See: <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/MENAEXT/0,,menuPK:247619~pagePK:146748~piPK:146812~theSitePK:256299,00.html> for details on MENA countries.

correlated with inequality, just not quite as strongly.

In *Figure 6*, we plot investment vs. Gini (WDI) and investment vs. Gini (UNU) for all recipient countries and for MENA countries. We can just barely see a positive relationship between investment and inequality in the all-country plots, and a negative relationship between investment and inequality in the MENA plots. That the correlation direction for MENA differs from the correlation direction for the overall dataset is interesting, but these observations are on shaky grounds at best.

To begin the statistical exploration of the relationships between aid, investment, and inequality, we create a table of correlations between the two measures of Gini, bilateral aid, multilateral aid, and investment. This is given in *Table 5*. The correlation statistics, like the scatter plots above, contradict our empirical hypothesis of a positive relationship between bilateral aid and inequality, and confirm our empirical hypothesis of a negative relationship between multilateral aid and inequality. While investment is correlated with inequality, the direction of correlation (positive) does not match up with our theoretical predication (negative). On a relative magnitude basis, multilateral aid is the most correlated with inequality, and investment the least. This agrees with our scatter plot observations. As for the other correlations, it is interesting that investment is uncorrelated with bilateral aid but correlated with multilateral aid. Not surprisingly, the two strongest positive correlations are between the two measures of inequality and between the two measures of aid.

Regression Results

Our regression results are presented in *Table 6 – 8* and *Table 10 – 11*. Note that regression columns with Gini (UNU) as the dependent variable are shaded in gray.

In the by-country regressions of *Table 6 – 8*, we don't observe any statistically

significant relationships between inequality and any of the independent variables of interest, i.e. bilateral aid, multilateral aid, and investment. This is perhaps not surprising given the quality of our dataset and the possibility of country-specific effects of the independent variables of interest. For example, even after controlling for social and economic indicators and country-specific effects, the effect of investment in country A may still be different from the effect in country B. To account for this, we would need to interact the investment variable with the country-specific dummies. We cannot do this with our dataset because we have too few observations for each country to tease out potential country-specific investment and aid effects.

To test whether the sign of the main independent variable in Regressions (1) – (24) matches our hypotheses, we performed a one-tailed t-test for each regression.²⁴ The resulting p-values are displayed in *Table 9*. Once again, no conclusive results can be derived. All p-values except for one fall within the [0.10, 0.90] range, indicating that we can neither accept nor reject a positive (or negative) relationship. Only in Regression (6) can we reject that the relationship between the main independent variable, in this case bilateral aid, and inequality is positive. From this, we conclude that we find no relationships between aid, investment, and inequality on a within-country basis.

In regards to the coefficients on the other included variables, GDP is statistically positively correlated with inequality in two regressions using bilateral aid and three regressions using investment. An increase in GDP of 100 billion constant 2000 US dollars correlates to a greater-than-unity increase in inequality, as represented by Gini on a 100-point scale. Economic freedom is also statistically positively correlated with

²⁴ For consistency, our null hypothesis is negative correlation between the main independent variable (bilateral aid, multilateral aid, or investment) and inequality.

inequality, but only in full-specification regressions, i.e. regressions (8), (16), and (24); an increase in economic freedom of 10 units (on a 100-unit scale) increases inequality by around 2 points. Together, these suggest that robust economic growth leads to higher inequality. We make sense of this by hypothesizing that countries with greater economic freedom experience faster economic growth, and thereby higher GDP, and that in the short-run, the spoils of a larger war chest accrue predominantly to the already-wealthy. In the medium- and long-run, which perhaps have yet to take place in recently-liberalized countries, inequality may decrease as countries learn to distribute economic gains more equitably. This explanation is in accord with the Kuznets Curve and work done in this area by Francois and Rojas-Romagosa (2008), who found a five-stage, time-dependent relationship between income inequality and economic development.

Trade, like economic freedom, is statistically significant in the full-specification regressions on Gini (UNU), but negatively instead of positively. An increase in the share of GDP attributed to trade of 10 percent correlates to a decrease in inequality of over 0.5 points. This seems to confirm our intuition that long-run inequality decreases as interactions with the global economy, i.e. trade and investments, increase, perhaps because these interactions make high inequality unsustainable for ideological and/or resource allocation reasons.

Finally, and perhaps with the most relevance for countries in MENA, we find that energy production is statistically negatively related to inequality in two regressions using bilateral aid, one regression using multilateral aid, and three regressions using investment. Our results suggest that an increase in energy production of 100,000 Kt will reduce inequality by well over unity. Using the approximate conversion of 1 Kt to 8000 barrels (US) of oil, 100,000 Kt translates into 800 million barrels

of oil.²⁵ As a reference, Saudi Arabia produced 3,694 million barrels of oil in 2010.²⁶ This finding must be interpreted with a grain (or many grains) of salt. Clearly, there is no mechanism that directly connects oil production to inequality reduction. (Otherwise, a country with Saudi Arabia's oil production profile is predicted to go from complete inequality to complete equality in less than 22 years!) Given that many authoritarian Middle Eastern countries are large producers of oil, we would then expect them to have relatively low levels of inequality. This is indeed the case, as confirmed by Adams and Page (2003). One likely explanation is that oil production gives authoritarian regimes access to financial resources, which may then be used to "purchase" acquiescence.

In the by-region regressions of *Table 10* – *11*, we do observe statistical significance on some main independent variables. Regressions (27) – (28) indicate that an increase in multilateral aid of 100 million US dollars corresponds to a decrease in inequality of 0.8 points. Additionally, Regressions (33) – (34) suggest that the effect of multilateral aid on inequality is affected by economic freedom. The more economic freedom there is, the less negative the effect of multilateral aid on inequality becomes. Given sufficient economic freedom, multilateral aid may even increase inequality. To the extent that economic freedom is an indicator of economic "maturity," we may therefore conclude that multilateral aid has the most inequality-reduction effect in developing countries.

Although the coefficients on bilateral aid in *Table 10* are not statistically significant, they become so when the interaction variables are added in *Table 11*. Like multilateral aid, bilateral aid is negatively correlated with

²⁵ Conversion between barrel of oil and ton of oil depends on the crude type. In round numbers, 7-9 barrels (US) make up 1 ton (<http://oils.gpa.unep.org/facts/quantities.htm>).

²⁶ <http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2011/03/23/investopedia51363.DTL>

inequality; moreover, its effect decreases as economic freedom increases.

The coefficients on investment in *Table 10-11* remain insignificant. In regards to other variables, the significance and magnitude of GDP and energy production are unchanged. The independent effect of economic freedom, however, largely disappears. Finally, the previously negative effect of trade on inequality disappears in *Table 10* and turns into a positive effect in *Table 11*. Though these changes are interesting to note, they are not a critical component of our analysis; as such, we omit further discussions.

Further Empirical Studies

The empirical component of our paper, designed to test our theoretical predications, illustrates the challenge of finding reliable macroeconomic data on developing countries. In our dataset, we used developing countries as proxies for non-democratic countries because these two groups have considerable overlap. Ideally, we want to look at only non-democratic countries. We didn't have the luxury of doing this because our dataset would have been too small. Furthermore, our empirical work was limited by the availability of Gini data and the inconsistency of Gini derivations. To overcome this data flaw, future studies may wish to use an alternative measure of inequality, such as the ratio between the share of total income going to the richest 10 percent and the share going to the poorest 10 percent. These ratios can be hand-calculated from very basic income data, whereas derivations of Gini coefficients require more complete knowledge of income distributions.

V. Policy Implications and Existing Literature

While our empirical work falls short of producing clean evidence supporting our theoretical predications, we nonetheless proceed now to make policy recommendations on the basis of both our theoretical and

empirical work. We do this because we believe that the quality of data in our empirical work has masked some of the validity of our theoretical predictions and because, as we will discuss shortly, our theoretical findings are in accord with other academic findings.

Our theoretical work shows that aid is a double-edged sword. Under the right conditions, i.e. with proper restrictions, it can reduce inequality without breaking the donor's money chest. Without sufficient restrictions, increasing levels of aid are needed to reduce inequality. Our empirical work suggests that thus far, aid has not gone hand-in-hand with proper restrictions, hence the negative relationship between aid and inequality. Our empirical work also suggests that the source of aid makes a difference – aid given by multilateral sources tends to have a greater effect on inequality. There can be many explanations for this. Multilateral organizations are less motivated by country-specific agendas and so more likely to premise aid on socioeconomic factors such as inequality. They may also have a better aid administration and accountability system than individual countries.

In regards to investment, our model predicts that investment lowers inequality in the recipient country. However, we find no evidence in our empirical work to support such a relationship. Then again, it may well be the case that the impact of investment on inequality is strongly affected by variables that we controlled for, such as GDP and economic freedom. Hence, as the result of our empirical analysis, we are skeptical of investment's ability to independently influence inequality in the recipient country.

To situate our work within the relevant literature, we briefly survey some existing studies on aid, investments, and inequality.²⁷ Bornschieer et al. (1978) found that foreign

²⁷ This literature review is distinct from the one in our paper's introduction, where the focus was on democratization in the Middle East.

investments and aid have the long-term effect of decreasing the rate of economic growth and of increasing inequality. Our work can be said to have added to their findings by specifying the conditions under which aid and inequality are positively related. Boone (1996) studied aid effectiveness and political regimes, and found that aid does not benefit the poor as measured by improvements in human development indicators. In response to this, we note that the impact of aid may be different for different types of aid, e.g. bilateral aid and multilateral aid. Alesina and Dollar (2000) examined the pattern of aid flow and found evidence that much of aid-giving is motivated by political and strategic considerations. They also found that whereas aid responds to political variables, foreign direct investments are usually aligned with economic incentives. This agrees with our work, as we previously noted that the effect of investments on inequality may be tied to economic variables that we controlled for in our regressions, which would explain our insignificant regression coefficients for investment. Burnside and Dollar (2000) worked on aid and growth, and came to the same conclusion that we did in regards to aid policies, which is that aid systematically conditioned on good policy is more effective for socioeconomic developments. Carapico (2002) focused on the competition and conflict(s) that break out when resources move into a resource-scarce environment. In extremely poor countries, state-civil relationships may be harmed in the presence of resource inflows. Recognizing and pre-empting this undesirable outcome is hence an important part of aid-giving, as is, undoubtedly, our overall emphasis on foreign donors and organizations not undertaking actions that may drastically alter the status quo. Finally, Easterly (2003) also studied aid and growth and noted, as we did, that aid quality is at least just as important as aid quantity.

Conclusion

We see in Acemoglu and Robinson (2006) a means for pushing democratization forward in the Middle East. We base our work on the premise that inequality can impact democratization and hope that via this paper, we have established a reasonable case for how foreign aid in particular can impact inequality. While our model suggests that foreign investments can also affect inequality, using investments to promote democracy may not be feasible as investment decisions must ultimately be grounded in economics and not politics. Based on our understanding of the existing literature, we see our contribution to democratization in the Middle East as 1) connecting foreign aid, foreign capital investments, and inequality with democratization in the Middle East and 2) developing a theoretical mechanism for promoting democratization that conveniently bypasses the traditional scholarly dispute over why the Middle East has failed to democratize.

We have included discussions on the existing literature in democratization in the Middle East and in aid, investment, and inequality to both orient our work and demonstrate that these are well-studied fields. The potential connection between them, however, is not well-studied. Acemoglu and Robinson (2006) filled in some of this gap, but failed to go all the way because they left out the Middle East in their work. Our work is therefore novel in that it connects aid, investments, and inequality with democratization in the Middle East.

Our work is also original in that we develop a theoretical mechanism for promoting democratization that conveniently bypasses the traditional scholarly dispute over why the Middle East has failed to democratize. Our theoretical mechanism uses foreign capital investments and aid to move inequality into the intermediate range prescribed by Acemoglu and Robinson (2006) as being the most conducive to democratic transitions. Empirical

evidence, however, suggests that only aid may be meaningfully manipulated. In any case, our mechanism is useful because it does not rely on pinpointing an explanation for the present lack of democracy in the Middle East; in deriving the mechanism, we disregarded how the present state of affairs came into existence in the country of interest and instead focused on what could be done to move that country towards democracy. Our main conclusion is that donors, especially multilateral ones, can impact socioeconomic conditions within a country via aid-giving to that country. More generally, we argue that properly designed aid programs targeting inequality can support democratization in the area of the world most in need of it.²⁸ The most challenging part of using our mechanism is perhaps figuring out where inequality in a country is currently and where it needs to be for democratization to become likely.

The latest available Gini data on countries in the Middle East suggests that inequality has been on the rise. In Yemen, the Gini coefficient went from 33.4 in 1998 to 37.7 in 2005.²⁹ In Egypt, it jumped from 28.9 in 1995 to 34.4 in 2001 (Arab Human Development Report 2002). This trend is made more alarming by studies before the turn of the 21st century which concluded that developing countries in the Middle East have some of the most equal income distributions in the world (Arab Human Development Report 2002). Clearly, there are many questions that come to mind. What has prompted inequality to increase recently? The rise of unemployed youth? The inability of the state to maintain low inequality via the disbursement of rent income, i.e. oil revenues?

Within the parameters of our paper, if 1) countries in the Middle East have become more unequal over the past decade, as raw numbers suggest has been the case; 2) they failed to democratize when inequality was reasonably low in the 1990s; and 3) political unrest resembling agitation for democracy has been on the rise, then we may perhaps conclude that many countries in the region are currently within a band of inequality that is highly conducive to democratization. In other words, events since the Tunisian revolution in December 2010 suggest that the Middle East is currently on (or in the vicinity of) the peak of the inverse-U-shaped curve relating inequality to likelihood of democratization.

Indeed, the wave of protests that has been spreading across the Middle East and that has already forced some of the region's best-known authoritarian rulers from power is indicative of a transformational process. At this point, it is hard to tell whether what we have been witnessing is incremental democratization or merely regime transitions. The rather abrupt manner in which some regimes have been brought down suggest – using terminology from our theoretical model – that the change-state has materialized. Can the newly empowered “commoners” overcome the very real coordination issues that we explicitly left out in our model and thereby capitalize on their hard-earned momentum for democratization?

Finally, what role can foreign aid and foreign capital investment play in a reconstituted Middle East? Democratization or not, the international community cannot and will not disengage itself from the land of “black gold.” Events since December 2010 have bequeathed one clear lesson for both local elites and those observing from elsewhere: inequality is important not only in terms of wealth and income distributions, but also in terms of opportunity distributions. The prominent role played by the mighty youth in recent events was precipitated by frustration and no hope for

²⁸ An implicit assumption of this paper has been that democracies are preferable to any other type of government. This is clearly open to debate, which is outside the purview of this paper.

²⁹ *CIA World Factbook*.
<https://www.cia.gov/library/publications/the-world-factbook/fields/2172.html?country>
 Code=al&rankAnchorRow=#al. Accessed April 19, 2010.

a better future. In light of these, the international community should work with competent and qualified parties based in the Middle East to create meaningful employment opportunities and to support legitimate individual aspirations. Within the context of such an endeavor, aid-giving and investment-making represent natural foundations for building international relationships that seek to protect self-interests by ensuring mutual, lasting prosperity.

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Appendix A**Part I -Mathematical Derivations-**

We solve $U_n^c \geq U_c^c$ for θ .

$$U_n^c \geq U_c^c$$

$$\frac{1-\theta}{1-\delta}[Y(F+K)-rK] + \frac{\beta}{1-\delta}A \geq \frac{1}{1-\delta}[Y((1-\lambda)(F+K))-r(1-\lambda)K] + \frac{1-\beta}{1-\delta}A$$

$$(1-\theta)[Y(F+K)-rK] + \beta A \geq [Y((1-\lambda)(F+K))-r(1-\lambda)K] + (1-\beta)A$$

$$(1-\theta)[Y(F+K)-rK] + \beta A - (1-\beta)A \geq [Y((1-\lambda)(F+K))-r(1-\lambda)K]$$

$$Y(F+K)-rK + (2\beta-1)A \geq [Y((1-\lambda)(F+K))-r(1-\lambda)K] + \theta[Y(F+K)-rK]$$

$$[Y(F+K)-rK] + (2\beta-1)A - [Y((1-\lambda)(F+K))-r(1-\lambda)K] \geq \theta[Y(F+K)-rK]$$

$$\frac{[Y(F+K)-rK] + (2\beta-1)A - [Y((1-\lambda)(F+K))-r(1-\lambda)K]}{[Y(F+K)-rK]} \geq \theta$$

$$\frac{[Y(F + K) - Y((1 - \lambda)(F + K))] - r\lambda K}{[Y(F + K) - rK]} + \frac{(2\beta - 1)A}{[Y(F + K) - rK]} \geq \theta$$

Part II

We solve $U_n^e \geq U_c^e$ for θ .

$$U_n^e \geq U_c^e$$

$$\frac{\theta}{\delta}[Y(F + K) - rK] + \frac{1 - \beta}{\delta}A \geq \frac{\beta}{\delta}A$$

$$\theta[Y(F + K) - rK] + (1 - \beta)A \geq \beta A$$

$$\theta[Y(F + K) - rK] \geq \beta A - (1 - \beta)A$$

$$\theta[Y(F + K) - rK] \geq (2\beta - 1)A$$

$$\theta \geq \frac{(2\beta - 1)A}{[Y(F + K) - rK]}$$

Appendix B**Part I -Regression Specifications- Key**

wdi_{it}	Gini of country i in year t (Source: WDI)
unu_{it}	Gini of country i in year t (Source: UNU-WIDER)
$odanet_dac_{it}$	Bilateral aid net flow into country i in year t
$odanet_mul_{it}$	Multilateral aid net flow into country i in year t
$invest_{it}$	Investment net flow into country i in year t
cor_{it}	Political Risk Rating of country i in year t
$econfree_{it}$	Index of Economic Freedom of country i in year t
pop_{it}	Population of country i in year t
gdp_{it}	GDP in constant 2000 USD of country i in year t
inf_{it}	Annual % change in CPI of country i in year t
sav_{it}	Gross domestic savings as % of GDP of country i in year t
$trade_{it}$	Trade as % of GDP of country i in year t

$enerpro_{it}$	Energy production, in Kt of oil equivalent, of country i in year t
Z_i	Dummy for country (or region) i
ε_{it}	Error term of regression

Part II

Regression equations

BILATERAL AID

(by country)

Base Specifications

$$wdi_{it} = \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 Z_i + \varepsilon_{it} \quad (1)$$

$$unu_{it} = \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 Z_i + \varepsilon_{it} \quad (2)$$

Base and Social Indicators

$$wdi_{it} = \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 cor_{it} + \beta_3 econfree_{it} + \beta_4 pop_{it} + \beta_5 Z_i + \varepsilon_{it} \quad (3)$$

$$unu_{it} = \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 cor_{it} + \beta_3 econfree_{it} + \beta_4 pop_{it} + \beta_5 Z_i + \varepsilon_{it} \quad (4)$$

Base and Economics Indicators

$$\begin{aligned} wdi_{it} = & \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 gdp_{it} + \beta_3 inf_{it} + \beta_4 sav_{it} \\ & + \beta_5 trade_{it} + \beta_6 enerpro_{it} + \beta_7 Z_i + \varepsilon_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} unu_{it} = & \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 gdp_{it} + \beta_3 inf_{it} + \beta_4 sav_{it} \\ & + \beta_5 trade_{it} + \beta_6 enerpro_{it} + \beta_7 Z_i + \varepsilon_{it} \end{aligned} \quad (6)$$

Base, Social, and Economic Indicators

$$\begin{aligned} wdi_{it} = & \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 cor_{it} + \beta_3 econfree_{it} + \beta_4 pop_{it} \\ & + \beta_5 gdp_{it} + \beta_6 inf_{it} + \beta_7 sav_{it} + \beta_8 trade_{it} + \beta_9 enerpro_{it} + \beta_{10} Z_i + \varepsilon_{it} \end{aligned} \quad (7)$$

$$\begin{aligned} unu_{it} = & \beta_0 + \beta_1 odanet_dac_{it} + \beta_2 cor_{it} + \beta_3 econfree_{it} + \beta_4 pop_{it} \\ & + \beta_5 gdp_{it} + \beta_6 inf_{it} + \beta_7 sav_{it} + \beta_8 trade_{it} + \beta_9 enerpro_{it} + \beta_{10} Z_i + \varepsilon_{it} \end{aligned} \quad (8)$$

MULTILATERAL AID

(by country)

For (9) – (16), replace $odanet_dac_{it}$ in (1) – (8) with $odanet_mul_{it}$.

INVESTMENT

(by country)

For (17) – (24), replace $odanet_dac_{it}$ in (1) – (8) with $invest_{it}$.

BILATERAL AID, MULTILATERAL AID, INVESTMENT

(by region)

For (25) – (30), variable specifications correspond to (7), (8), (15), (16), (23), and (24).

BILATERAL AID, MULTILATERAL AID, INVESTMENT

(by region, including interaction variables)

For (31) – (32), add

$odanet_dac_{it} * enerpro_{it}$, $odanet_dac_{it} * cor_{it}$, and $odanet_dac_{it} * econfree_{it}$

to (25) – (26).

For (33) – (34), add

$odanet_mul_{it} * enerpro_{it}$, $odanet_mul_{it} * cor_{it}$, and $odanet_mul_{it} * econfree_{it}$

to (27) – (28).

For (35) – (36), add

$invest_{it} * enerpro_{it}$, $invest_{it} * cor_{it}$, and $invest_{it} * econfree_{it}$

to (29) – (30).

Figure 1 -Model for examining the influence of foreign capital investments, K , and aid money, A , on inequality in a given country, X.-

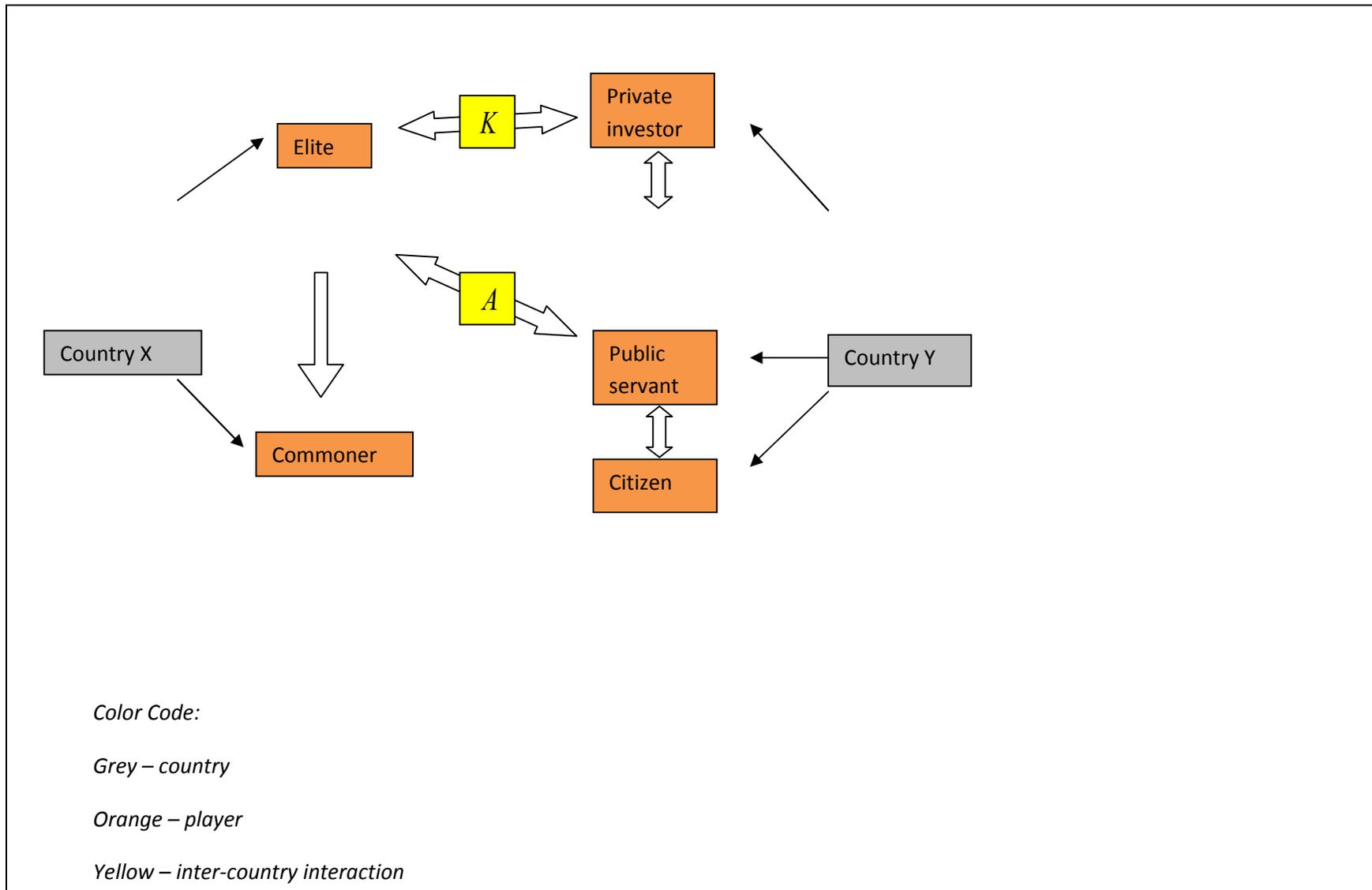
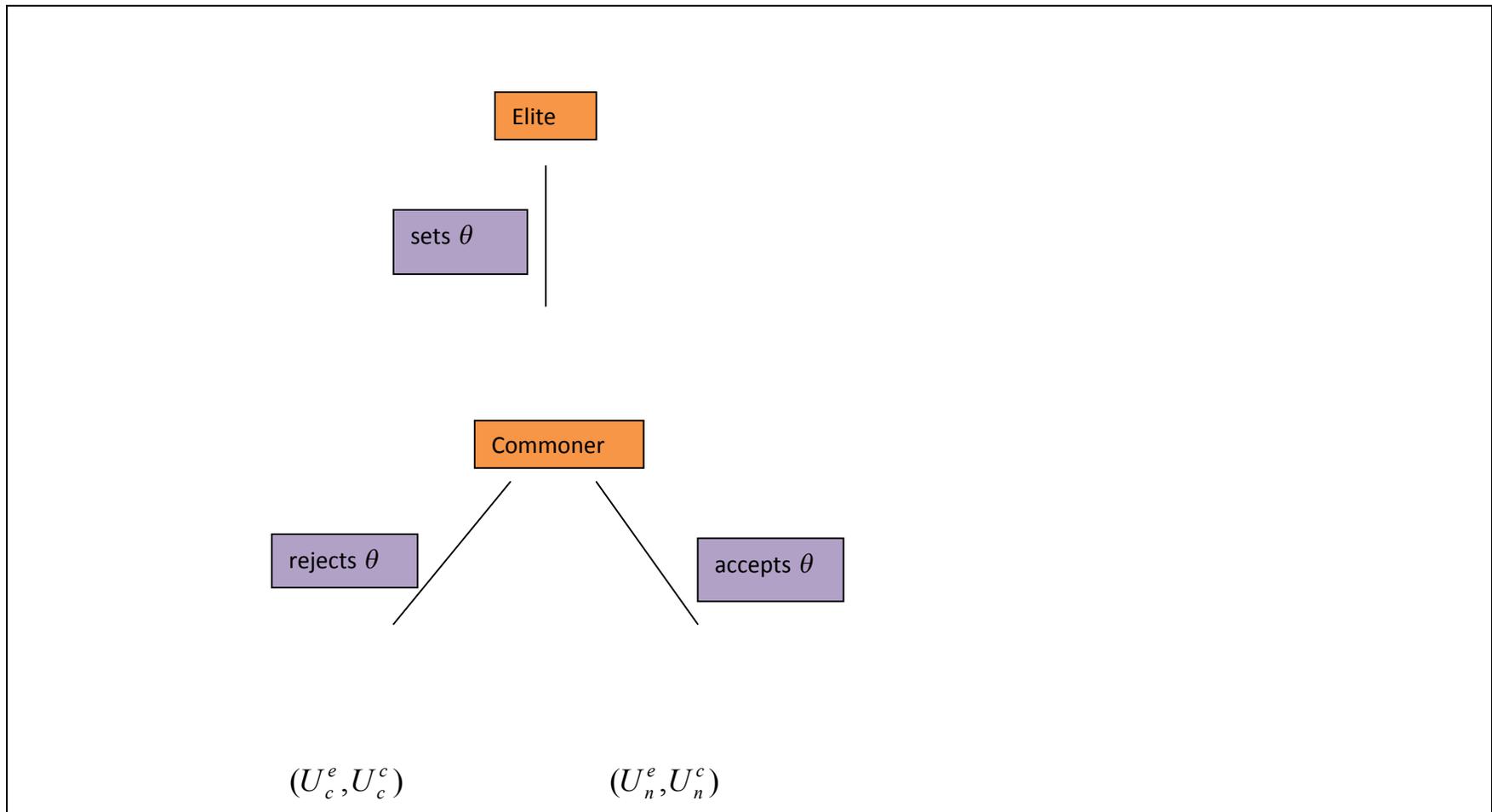


Figure 2

Elite vs. Commoner



Color Code:

Purple – action; Orange – player

Figure 3³⁰

Implication of $Y(\bullet)$'s Concavity

$$Y(\bullet) = -e^{(-0.2(x - 8))} + 5, K_1 < K_2, \lambda = 0.5, F \text{ fixed.}$$

³⁰ Graph produced through http://www.walterzorn.com/grapher/grapher_e.htm on March 23, 2010.

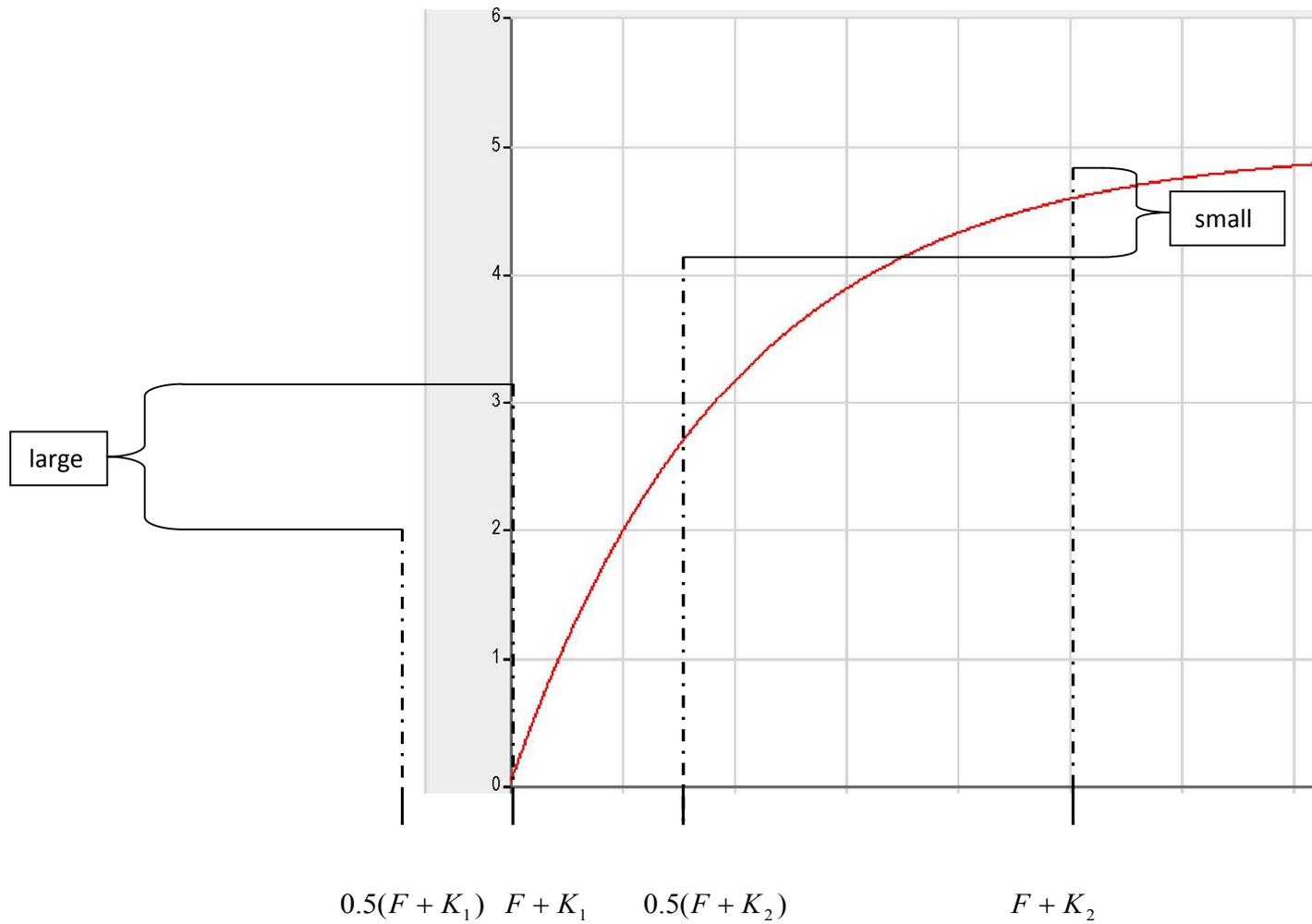


Figure 4 -Bilateral aid and Gini-

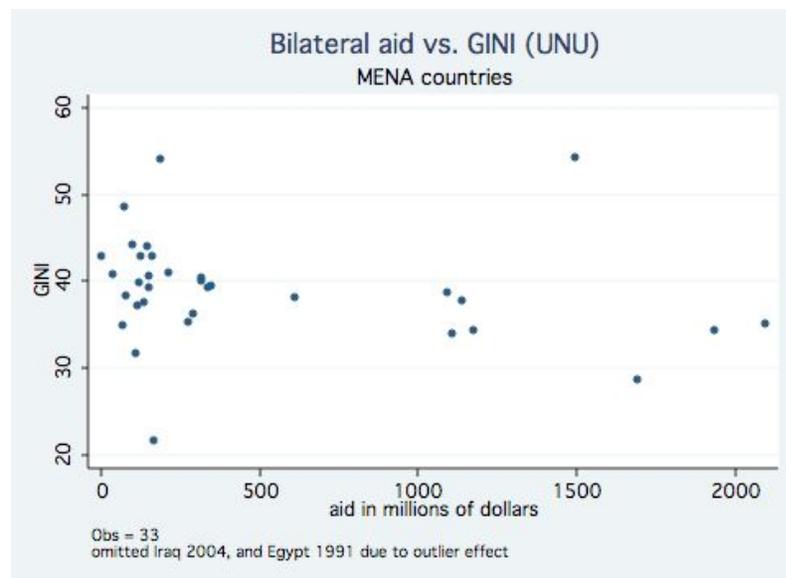
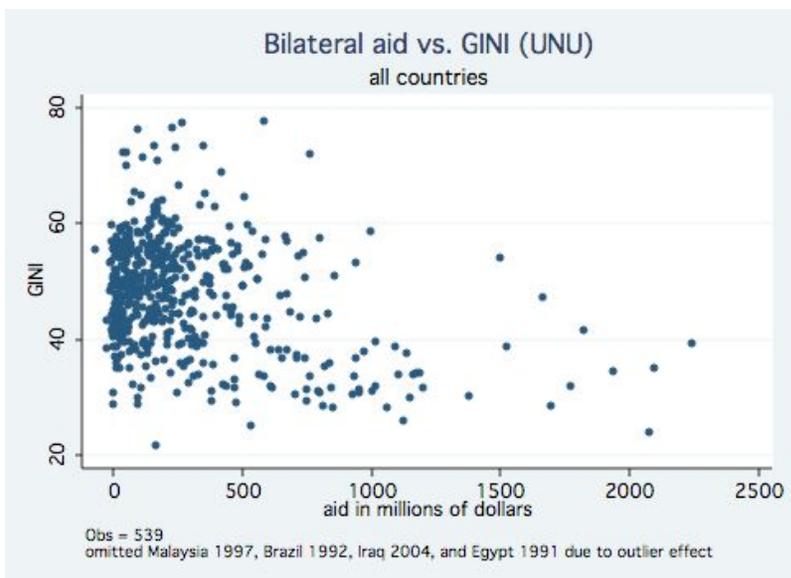
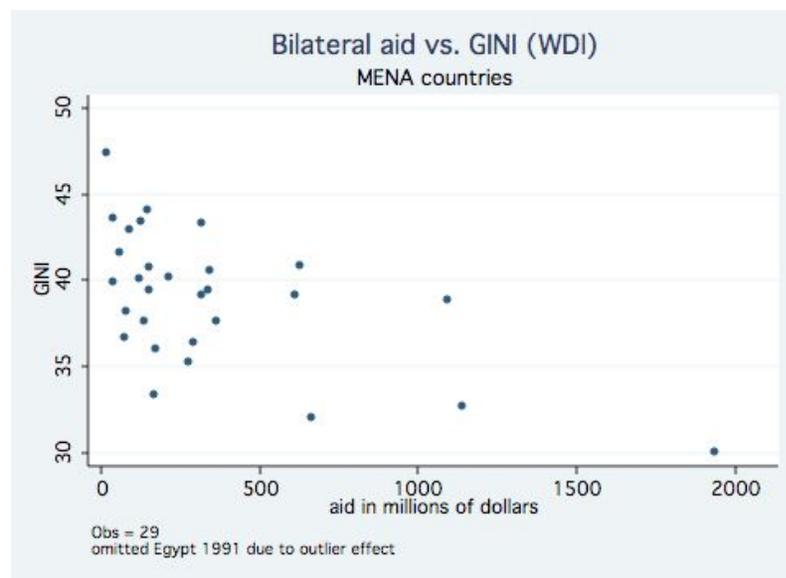
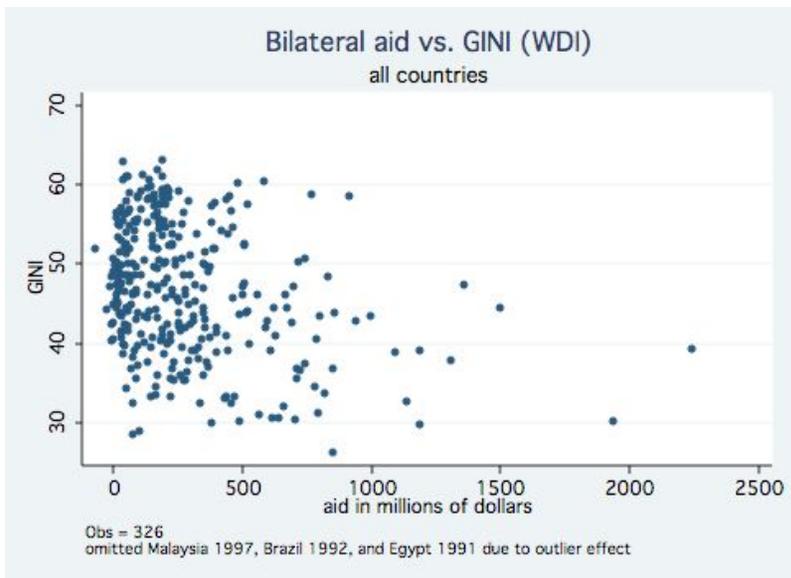


Figure 5 -Multilateral aid and Gini-

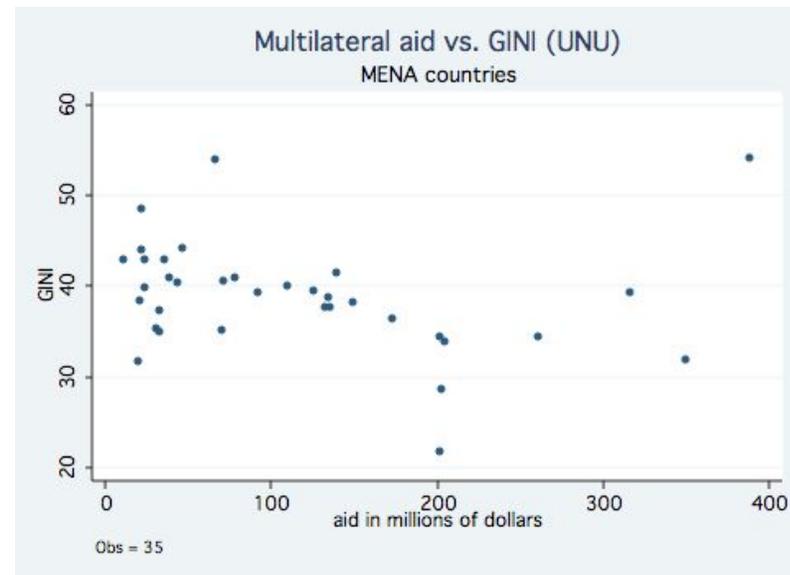
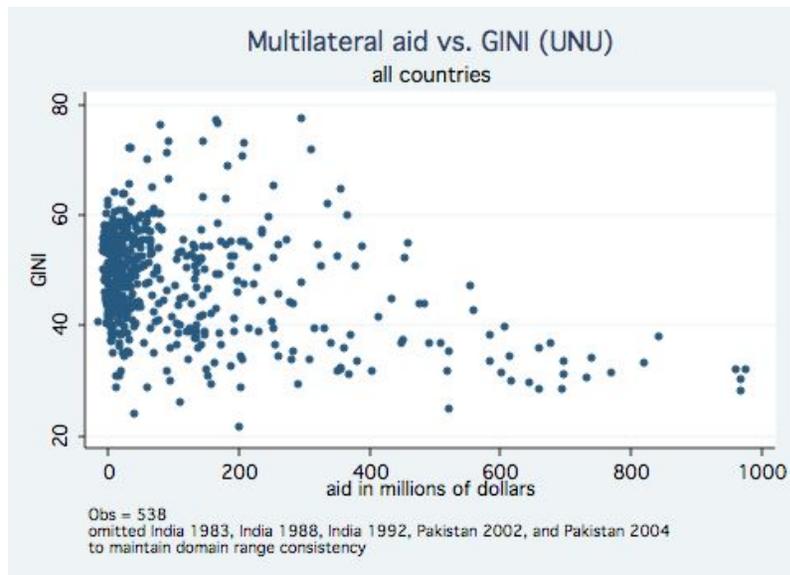
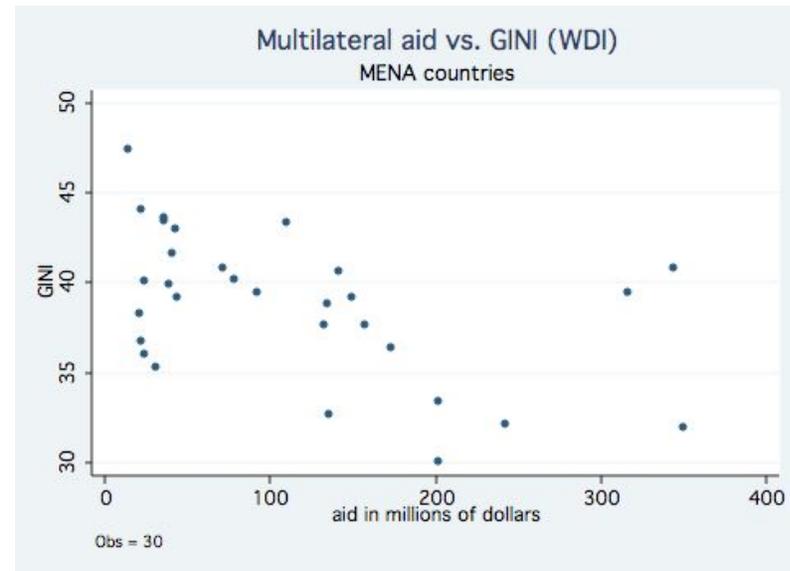
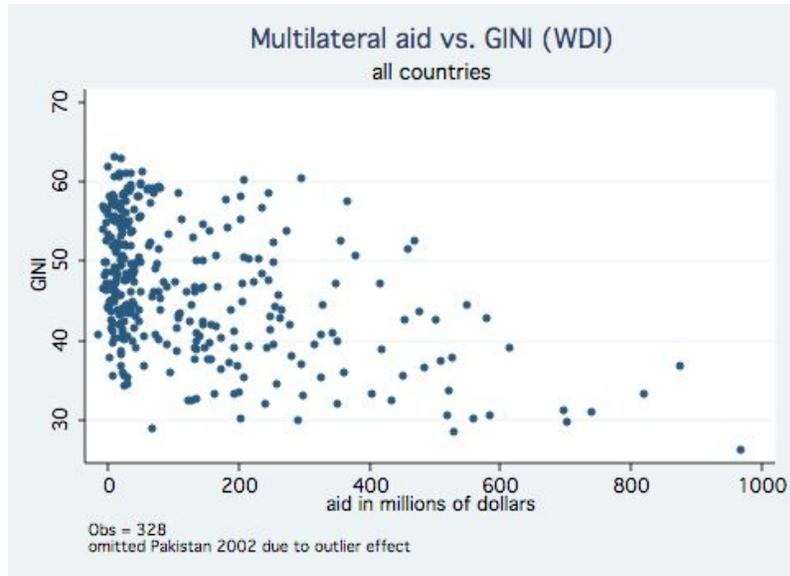


Figure 6 -Investment and Gini-

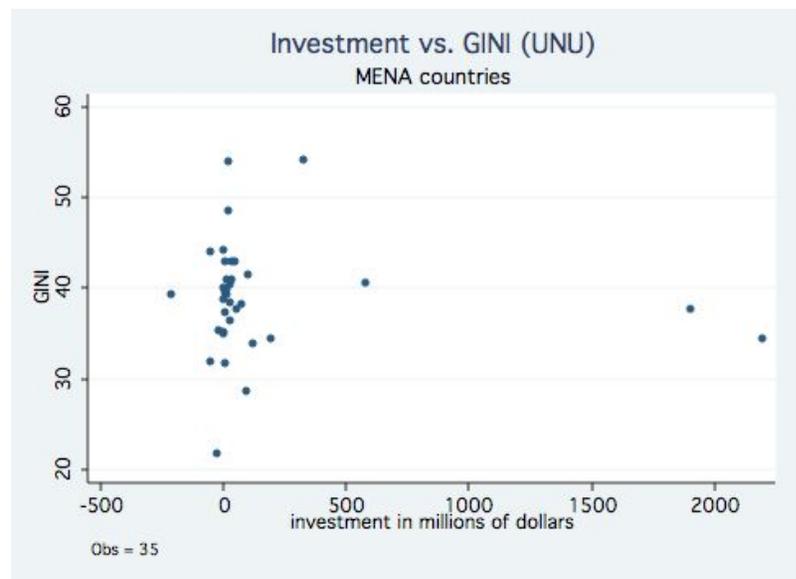
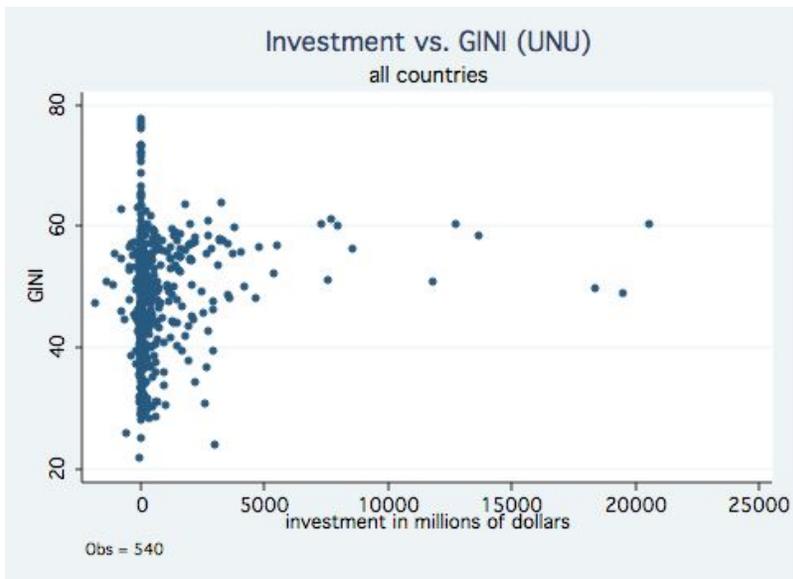
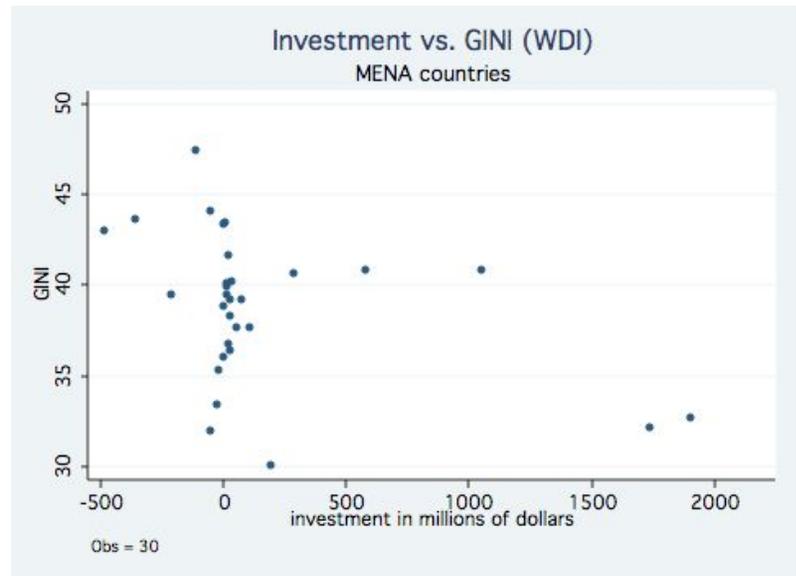
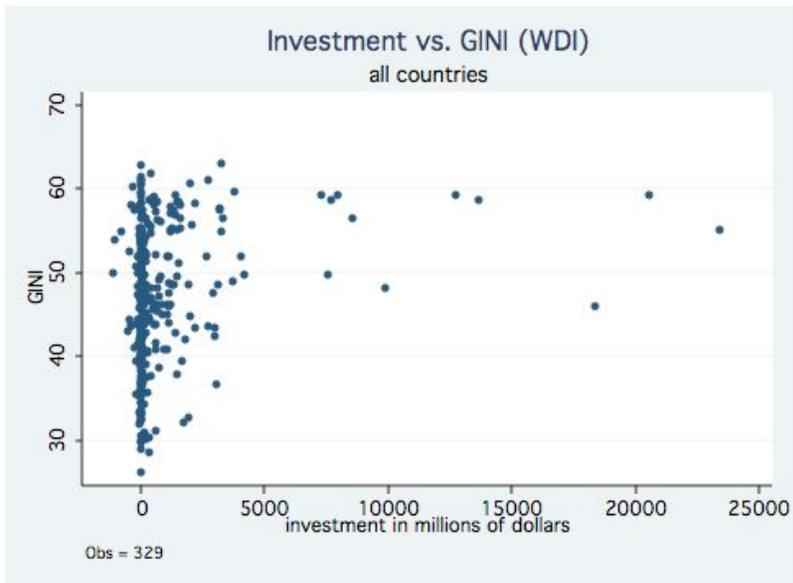


Table 1**Summary of Theoretical Variables**

Below is a summary of all the variables introduced in Section II's introduction of our inequality model. The variables are organized by the controlling or supplying party. For instance, A is controlled by the public servants in Y and so falls under the heading of Y: PUBLIC SERVANTS in the table.

X: ELITES	X: COMMONERS	Y: PRIVATE INVESTORS	Y: PUBLIC SERVANTS	Y: CITIZENS	NATURE
θ fraction of total non- aid-based income in X going to the elites		K productive capital supplied to X	A aid supplied to X		δ population fraction of the elites
			β level of restrictions associated with A		$Y(\bullet)$ net production in X, as a function of productive resources
					r internationa lly- acceptable return to capital
					F endogenous productive resources in X

Table 2³¹**Dataset Coverage**

COUNTRY (TOTAL: 79)	Gini (WDI)	Gini (UNU)
Algeria	1988, 1995	1988, 1995
Angola	2000	-
Argentina	1980, 1981, 1986, 1992, 1996, 1998, 2002, 2005	1980-1983, 1985-2006
Bangladesh	1992, 1996, 2000, 2005	1981, 1983, 1986, 1988, 1989, 1992, 1996, 2000, 2005
Barbados	-	1980, 1981
Benin	2003	2003
Bolivia	1991, 1997, 1999, 2002, 2005	1986, 1989, 1990, 1992, 1993, 1995-1997, 1999, 2000, 2002, 2004
Botswana	1986, 1994, 1995	1986, 1994
Brazil	1981-1990, 1992, 1993 1995-1999, 2001-2003, 2005, 2007	1980-1990, 1992, 1993 1995-1999, 2001-2003, 2004, 2005
Burkina Faso	1994, 1998, 2004	1994, 1995, 1998, 2003
Burundi	1992, 1998, 2006	1992, 1998
Cameroon	1996, 2001	1983, 1996, 2001
Central African Republic	1993, 2003	1992
Chad	2003	-
Chile	1987, 1990, 1994, 1996, 1998, 2000, 2003, 2006	1980-1996, 1998-2000, 2003
Colombia	1995, 1996, 1999, 2000, 2003, 2006	1980, 1982, 1983, 1985, 1988, 1989, 191-2000, 2004

³¹ MENA countries are in bold.

Congo Democratic Republic	2006	-
Congo Republic	2005	-
Costa Rica	1986, 1990, 1993, 1996, 1998, 2000, 2001, 2003, 2005	1981-1983, 1986, 1989, 1990-1998, 2000-2006
Côte d'Ivoire	1985, 1997, 1988, 1993, 1995, 1998, 2002	1985-1988, 1993, 1995, 1998, 2002
Djibouti	1996, 2002	1996, 2002
Dominican Republic	1986, 1989, 1992, 1996, 2000, 2003, 2005	1984, 1986, 1989, 1992, 1995-1998, 2000-2006
Ecuador	1987, 1994, 1998, 2003, 2005, 2007	1987, 1988, 1994, 1995, 1998-2000, 2003-2006
Egypt	1991, 1996, 2000, 2005	1981, 1991, 1995-1997, 2000, 2004
El Salvador	1989, 1995, 1996, 1998, 2000, 2002, 2003, 2005	1990, 1991, 1994-2004
Ethiopia	1982, 1985, 2000, 2005	1981, 1995, 1997, 2000
Gabon	2005	1994
Gambia	1998, 2003	1992-1994, 1998
Ghana	1988, 1989, 1992, 1998, 2006	1987, 1989, 1992, 1993, 1997-1999
Guatemala	1987, 1989, 1998, 2000, 2002, 2006	1987, 1989, 1998, 2000, 2002-2004
Guinea	1991, 1994, 2003,	1991, 1994, 2003
Guyana	1993, 1998	1993, 1999
Haiti	2001	1987, 2000, 2001
Honduras	1990, 1992, 1994, 1997, 1999, 2003, 2005, 2006	1986, 1989-1999, 2003-2006
India	2005	1983, 1986-1995, 1997, 1999, 2004
Indonesia	2005	1980, 1981, 1984, 1987, 1990, 1993, 1996, 1999, 2002, 2005
Iran	1986, 1990, 1994, 1998, 2005	1984, 1998, 2005

Iraq	-	2003, 2004
Jamaica	1988, 1990, 1993, 1996, 1999, 2002, 2004	1980, 1988-1993, 1995-2000, 2002, 2004
Jordan	1987, 1992, 1997, 2003, 2006	1980-1982, 1986, 1992, 1997, 2003
Kenya	1992, 1994, 1997, 2005	1981-1983, 1992, 1994, 1997, 1999
Liberia	2007	-
Madagascar	1980, 1993, 1999, 2001, 2005	1980, 1993, 1997, 1999, 2001
Malawi	1998, 2004	1983, 1985, 1993, 1997, 2004
Malaysia	1984, 1987, 1989, 1992, 1995, 1997, 2004	1984, 1987, 1989, 1990, 1992, 1995, 1997, 1999, 2004
Mali	1994, 2001, 2006	1989, 1994, 2001
Mauritania	1987, 1993, 1996, 2000	1987-1989, 1992, 1993, 1995, 2000
Mauritius	-	1980, 1986, 1991, 1996, 2001
Mexico	1984, 1989, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006	1984, 1989, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2005
Morocco	1985, 1991, 1999, 2001, 2007	1980, 1985, 1991, 1995, 1999
Mozambique	1997, 2003	1996, 2002
Nepal	1996, 2004	1984, 1996, 2004
Nicaragua	1993, 1998, 2001, 2005	1993, 1998, 2001, 2005
Niger	1992, 1994, 2005	1992, 1994, 1995
Nigeria	1986, 1993, 1996, 2004	1980-1982, 1985, 1992, 1996, 1997, 2003
Pakistan	1987, 1991, 1993, 1997, 1999, 2002, 2005	1984-1988, 1990-1993, 1996, 1998, 2002, 2004, 2005
Panama	1991, 1995-1997, 2000, 2002, 2004, 2006	1980, 1989, 1991, 1995-2004
Paraguay	1990, 1995, 1998, 1999, 2002, 2005, 2007	1983, 1990, 1994, 1995, 1997, 1999, 2001-2005

Peru	1986, 1990, 1994, 1996, 2002, 2005, 2006	1981, 1986, 1991, 1994, 1997-2005
Philippines	1985, 1988, 1991, 1994, 1997, 2000, 2003, 2006	1985, 1988, 1991, 1994, 1997, 2000, 2003
Rwanda	1985, 2000	1984, 2000
Senegal	1991, 1995, 2001, 2005	1991, 1994, 2001
Sierra Leone	1990, 2003	1989, 2003
Somalia	-	2002
Sri Lanka	1985, 1991, 1996, 2002	1980, 1982, 1986, 1987, 1991, 1996, 2000, 2002
Suriname	1999	1999
Swaziland	1995, 2001	1994, 2001
Tanzania	1992, 2000	1983, 1991-1993, 2001
Thailand	1981, 1988, 1992, 1996, 1999, 2002, 2004	1981, 1986, 1988, 1990, 1992, 1994, 1996, 1998-2002
Togo	2006	-
Trinidad and Tobago	1988, 1992	1981, 1988, 1992
Tunisia	1985, 1990, 1995, 2000	1980, 1985, 1990, 2000
Uganda	1989, 1992, 1996, 1999, 2002 2005	1989, 1992, 2000, 2002
Uruguay	1992, 1996, 1998, 2000, 2001, 2005, 2006	1980-1987, 1989, 1992, 1995-1998, 2000-2005
Venezuela	1981, 1987, 1989, 1993, 1996, 1998, 2003, 2005, 2006	1980-2005
Vietnam	1993, 1998, 2002, 2004, 2006	1993, 1996, 1998, 2002, 2004
Yemen	1992, 1998, 2005	1992, 1998, 2005
Zambia	1991, 1993, 1996, 1998, 2003, 2004	1991, 1993, 1996, 1998, 2003, 2004
Zimbabwe	1995	1990, 1995

Table 3**Summary of Empirical Variables**

	VARIABLE	ABBREVIATION	DEFINTION	SOURCE
PRIMARY VARIABLES	Gini Index	wdi, unu	The ratio of the area that lies between the line of equality (of income/wealth) and the Lorenz curve over the total area under the line of equality, multiplied by 100. (scale of 0-100; 0=perfect equality)	WDI, UNU-WIDER
	Bilateral aid	odanet_dac	The total net ODA ³² flow from DAC donor countries ³³ to the specified recipient country (in millions of US dollars)	SourceOECD International Development Statistics
	Multilateral aid	odanet_mul	The total net ODA flow from Multilateral Organizations ³⁴ to the specified recipient country (in millions of US dollars)	SourceOECD International Development Statistics

³² Official Development Assistance (ODA) includes grants or loans to countries and territories on the DAC List of Developing Countries which are: - undertaken by the official sector; - with promotion of economic development and welfare as the main objective; - at concessional financial terms (if a loan, have a grant element of at least 25 per cent).

³³ DAC Donor countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

³⁴ Multilateral Organizations: African Development Bank, African Development Fund, Asian Development Bank, Asian Development Bank Special Funds, CARDB, Council of Europe, EBRD, EC, EIB, GEF, Global Fund, IBRD, IDA, IDB, IDB Special Op. Fund, IFAD, IFC, IMF, IMF Trust Fund, Montreal Protocol, Nordic Development Fund, Other UN, SAF&ESAF, UN Agencies, UNDP, UNFPA, UNHCR, UNICEF, UNRWA, UNTA, WFP, Arab Agencies.

	Investment	invest	Direct investment undertaken by residents of DAC Member countries (in millions of US dollars)	SourceOECD International Development Statistics
SOCIAL INDICATORS	Corruption	cor	An assessment of corruption within the political system that accounts for actual or potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for-favors', secret party funding, and suspiciously close ties between politics and business. (scale of 1-6; 6=least corrupt)	Political Risk Rating of ICRG
	Index of Economic Freedom	econfree	Average of ten dimensions of freedom: Business Freedom, Trade Freedom, Fiscal Freedom, Government Spending, Monetary Freedom, Investment Freedom, Financial Freedom, Property Rights, Freedom From Corruption, and Labor Freedom. (scale of 0-100; 100=most freedom)	Index of Economic Freedom
	Population	pop	Population	WDI

			(in millions)	
ECONOMIC INDICATORS	GDP	gdp	GDP in constant 2000 US Dollars (in millions of US dollars)	WDI
	Inflation	inf	Annual average percent change in the consumer price index.	WDI
	Savings	sav	Gross Domestic Savings as % of GDP.	WDI
	Trade	trade	Trade as % of GDP.	WDI
	Energy Production	enerpro	Kt of oil equivalent.	WDI

Table 4 -Summary Statistics-

VARIABLE	OBS	MEAN	STD DEV	MIN	MAX
wdi	329	46.77	8.21	26.21	62.99
unu	543	47.88	9.56	21.80	77.60
odanet_dac (in millions of US dollars)	615	292	409	-279	4,394
odanet_mul (in millions of US dollars)	615	126	199	-15	1,389
invest (in millions of US dollars)	612	689	2,169	-1,838	23,398
cor	517	2.71	0.94	0	6
econfree	305	58.65	9.41	23.70	78
pop (in millions)	613	54.11	141.47	0.25	1,094.58
gdp (in millions of constant 2000 US dollars)	613	76,371	140,216	325	813,000
inf (annual % change in CPI)	594	56.0	381.6	-11.5	7,481.7
sav (% of GDP)	598	16.7	10.6	-33.3	58.4

trade (% of GDP)	605	63.8	37.3	11.6	254.6
enerpro (Kt of oil equivalent)	533	49,841	77,631	1	420,292

Table 5**Correlations of Select Variables**

	GINI (WDI)	GINI (UNU)	bilateral aid	multilateral aid	investment
GINI (WDI)	1.0000				
GINI (UNU)	0.7626 (0.0000)	1.0000			
bilateral aid	-0.3135 (0.0000)	-0.3014 (0.0000)	1.0000		
multilateral aid	-0.4724 (0.0000)	-0.3956 (0.0000)	0.4956 (0.0000)	1.0000	
investment	0.2346 (0.0000)	0.1562 (0.0003)	-0.0411 (0.3102)	-0.0972 (0.0162)	1.0000

Note: p-value in parenthesis tests null that the variables are uncorrelated.

Table 6**Bilateral aid**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	wdi	unu	wdi	unu	wdi	unu	wdi	unu
odanet_dac	6.03e-05 (0.00105)	-0.000723 (0.00132)	-1.88e-06 (0.00134)	-0.00207 (0.00222)	-0.000580 (0.000918)	-0.00186 (0.00115)	-0.000960 (0.00119)	-0.00195 (0.00171)
gdp ³⁵					1.23 (0.754)	1.84** (0.835)	1.59 (1.040)	2.22* (1.170)
inf					-0.000288 (0.000455)	0.000285 (0.00103)	0.0269 (0.0185)	0.00906 (0.0260)
sav					0.0241 (0.0497)	-0.00788 (0.0543)	-0.0313 (0.0601)	0.0693 (0.0835)
trade					0.0218 (0.0143)	0.0132 (0.0164)	-0.000185 (0.0190)	-0.0531** (0.0250)
enerpro ³⁶					-3.78**	-2.32	-2.82	-4.66**

³⁵ In units of 100 billion constant 2000 US dollars.³⁶ In units of 100,000 Kt of oil equivalent.

					(1.52)	(1.52)	(1.99)	(2.33)
cor			0.0680	0.430			0.164	0.440
			(0.398)	(0.517)			(0.380)	(0.445)
econfree			0.0429	0.0552			0.0565	0.171**
			(0.0701)	(0.103)			(0.0633)	(0.0801)
pop			-0.0923	0.00167			-0.0105	-0.0123
			(0.0632)	(0.0428)			(0.0102)	(0.0112)
Constant	46.75***	48.08***	48.65***	45.17***	44.53***	46.35***	43.55***	40.29***
	(0.368)	(0.461)	(4.535)	(6.430)	(1.568)	(1.660)	(4.033)	(5.004)
Observations	329	543	185	246	264	458	153	221
R-squared	0.830	0.643	0.926	0.767				
Number of countries	75	73	61	56	54	51	48	45

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7

Multilateral aid

VARIABLES	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	wdi	unu	wdi	unu	wdi	unu	wdi	unu
odanet_mul	-0.000510 (0.00251)	-0.000725 (0.00326)	-0.00154 (0.00263)	0.000844 (0.00498)	-0.000764 (0.00257)	-0.000809 (0.00303)	-0.00298 (0.00268)	0.00311 (0.00435)
gdp ³⁷					0.560 (0.938)	0.757 (1.100)	-1.060 (1.960)	-0.147 (2.970)
inf					-0.000377 (0.000452)	0.000184 (0.00104)	-0.0115 (0.0262)	-0.000945 (0.0269)
sav					-0.0114 (0.0583)	-0.0200 (0.0608)	-0.0566 (0.0692)	0.0611 (0.0931)
trade					0.0260 (0.0163)	0.00332 (0.0192)	-0.00319 (0.0220)	-0.0793** (0.0311)
enerpro ³⁸					-3.79* (2.08)	0.846 (1.98)	-3.21 (3.65)	-6.50 (4.67)

³⁷ In units of 100 billion constant 2000 US dollars.

³⁸ In units of 100,000 Kt of oil equivalent.

cor			0.0563 (0.397)	0.511 (0.516)			-0.0288 (0.402)	0.401 (0.470)
econfree			0.0394 (0.0701)	0.0556 (0.104)			0.0835 (0.0774)	0.195** (0.0978)
pop			-0.0827 (0.0636)	0.0125 (0.0413)			0.0272 (0.0946)	0.0698 (0.0555)
Constant	46.83*** (0.386)	47.96*** (0.470)	48.70*** (4.530)	43.69*** (6.352)	46.94*** (1.391)	47.03*** (1.463)	46.10*** (5.432)	40.39*** (6.116)
Observations	329	543	185	246	264	458	153	221
R-squared	0.830	0.643	0.927	0.766	0.869	0.710	0.945	0.828

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8

Investment

	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
VARIABLES	wdi	unu	wdi	unu	wdi	unu	wdi	unu
invest	-0.000127 (0.000111)	0.000154 (0.000164)	-5.50e-05 (0.000108)	0.000107 (0.000166)	-0.000157 (0.000142)	7.12e-05 (0.000160)	-4.50e-05 (0.000120)	9.62e-06 (0.000150)
gdp ³⁹					1.68** (0.855)	1.89** (0.894)	1.73 (1.070)	2.53** (1.180)
inf					-0.000339 (0.000452)	0.000327 (0.00104)	0.0260 (0.0187)	0.0105 (0.0260)
sav					0.0194 (0.0498)	0.00494 (0.0547)	-0.0324 (0.0601)	0.0745 (0.0837)
trade					0.0221 (0.0142)	0.0117 (0.0165)	-0.000820 (0.0190)	-0.0554** (0.0252)
enerpro ⁴⁰					-4.11*** (1.54)	-2.76* (1.50)	-3.07 (2.01)	-5.16** (2.33)

³⁹ In units of 100 billion constant 2000 US dollars.

⁴⁰ In units of 100,000 Kt of oil equivalent.

cor			0.428 (0.360)	0.513 (0.478)			0.164 (0.377)	0.481 (0.444)
econfree			0.0377 (0.0574)	0.122 (0.0789)			0.0566 (0.0633)	0.177** (0.0805)
pop			-0.0130* (0.00690)	-0.0165** (0.00757)			-0.0113 (0.0104)	-0.0128 (0.0115)
Constant	46.87*** (0.232)	47.70*** (0.286)	43.13*** (3.443)	39.59*** (4.756)	44.28*** (1.547)	45.67*** (1.611)	43.36*** (4.017)	39.19*** (4.966)
Observations	329	540	185	246	264	457	153	221
R-squared	0.831	0.639						
Number of countries	75	73	61	56	54	51	48	45

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9**P-values from one-tailed t-tests**

	(1) wdi	(2) unu	(3) wdi	(4) unu	(5) wdi	(6) unu	(7) wdi	(8) unu
odanet_dac	0.477	0.7075	0.5005	0.8245	0.736	0.9475	0.791	0.8735
	(9) wdi	(10) unu	(11) wdi	(12) unu	(13) wdi	(14) unu	(15) wdi	(16) unu
odanet_mul	0.5805	0.588	0.7205	0.4325	0.6165	0.6055	0.866	0.2375
	(17) wdi	(18) unu	(19) wdi	(20) unu	(21) wdi	(22) unu	(23) wdi	(24) unu
invest	0.8735	0.1735	0.695	0.2605	0.866	0.328	0.6465	0.4745

Null hypothesis:

bilateral aid negatively correlated with inequality

multilateral aid negatively correlated with inequality

investment negatively correlated with inequality

Table 10**Bilateral aid, multilateral aid, and investment by region⁴¹**

VARIABLES	(25)	(26)	(27)	(28)	(29)	(30)
	wdi	unu	wdi	unu	wdi	unu
odanet_dac	0.000318 (0.00192)	0.00182 (0.00248)				
odanet_mul			-0.00806** (0.00360)	-0.00837* (0.00468)		
invest					8.41e-06 (0.000241)	0.000129 (0.000311)
gdp ⁴²	1.62** (0.700)	2.61*** (0.901)	1.06 (0.662)	1.80** (0.861)	1.56** (0.737)	2.13** (0.950)
inf	0.0202 (0.0415)	0.0999* (0.0534)	0.0235 (0.0403)	0.0996* (0.0524)	0.0195 (0.0414)	0.0975* (0.0534)
sav	0.0454 (0.0715)	0.0562 (0.0920)	0.0215 (0.0683)	0.0175 (0.0889)	0.0423 (0.0693)	0.0370 (0.0894)
trade	0.0205 (0.0177)	0.0228 (0.0227)	0.0228 (0.0171)	0.0274 (0.0222)	0.0209 (0.0174)	0.0254 (0.0225)
enerpro ⁴³	-1.89 (1.26)	-3.45** (1.62)	-2.33* (1.22)	-3.71** (1.59)	-1.85 (1.24)	-3.15* (1.59)
cor	-0.157 (0.632)	0.341 (0.813)	-0.346 (0.622)	0.114 (0.809)	-0.163 (0.631)	0.307 (0.813)

⁴¹ Regions: Africa, South America (incl. Central America and the Caribbeans), and Asia (incl. Middle East).

⁴² In units of 100 billion constant 2000 US dollars.

⁴³ In units of 100,000 Kt of oil equivalent.

econfree	0.0309 (0.0613)	0.0801 (0.0790)	0.00124 (0.0614)	0.0497 (0.0799)	0.0310 (0.0614)	0.0796 (0.0791)
pop	-0.0208 (0.0244)	-0.0347 (0.0314)	0.00603 (0.0239)	0.00197 (0.0311)	-0.0189 (0.0216)	-0.0238 (0.0278)
Constant	44.47*** (3.950)	40.42*** (5.084)	47.79*** (4.092)	44.28*** (5.322)	44.56*** (3.917)	40.99*** (5.050)
Observations	121	121	121	121	121	121
R-squared	0.642	0.475	0.658	0.487	0.642	0.473

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11 -Bilateral aid, multilateral aid, and investment by region (including interaction variables)-

VARIABLES	(31) wdi	(32) unu	(33) wdi	(34) unu	(35) wdi	(36) unu
odanet_dac	-0.0375*** (0.0137)	-0.0568*** (0.0175)				
odanet_mul			-0.0730*** (0.0261)	-0.0753** (0.0342)		
invest					-0.00254 (0.00208)	-0.00104 (0.00277)
gdp ⁴⁴	0.989 (0.820)	1.320 (1.050)	0.501 (0.743)	0.962 (0.973)	1.610** (0.710)	2.170** (0.945)
inf	0.0161 (0.0402)	0.0921* (0.0515)	0.0207 (0.0399)	0.0943* (0.0522)	-0.00211 (0.0406)	0.0889 (0.0540)
sav	0.0433 (0.0690)	0.0571 (0.0884)	0.0512 (0.0694)	0.0580 (0.0909)	-0.0196 (0.0740)	-0.0449 (0.0985)
trade	0.0382** (0.0187)	0.0503** (0.0239)	0.0307* (0.0174)	0.0348 (0.0228)	0.0206 (0.0168)	0.0268 (0.0224)
enerpro ⁴⁵	-2.02 (1.37)	-3.41* (1.75)	-2.65* (1.35)	-3.71** (1.76)	0.0396 (1.35)	-1.37 (1.80)
cor	0.436 (0.755)	0.724 (0.968)	-0.261 (0.655)	-0.0508 (0.858)	-1.014 (0.683)	-0.0412 (0.910)
econfree	-0.130* (0.0770)	-0.137 (0.0986)	-0.0976 (0.0727)	-0.0308 (0.0952)	0.0239 (0.0754)	0.0385 (0.100)
pop	0.00807 (0.0294)	0.0206 (0.0377)	0.0352 (0.0282)	0.0411 (0.0369)	-0.0408* (0.0218)	-0.0395 (0.0290)
odanet_dac*enerp	9.63e-09 (1.84e-08)	1.98e-08 (2.36e-08)				
odanet_dac*cor	-0.00161 (0.00225)	0.000505 (0.00289)				
odanet_dac*econf	0.000712*** (0.000224)	0.000968*** (0.000287)				
odanet_mul*enerp			-4.85e-08 (9.52e-08)	-7.87e-08 (1.25e-07)		
odanet_mul*cor			-0.000900 (0.00441)	0.00408 (0.00577)		
odanet_mul*econf			0.00122** (0.000480)	0.00111* (0.000628)		
invest*enerpro					-4.79e-09 (3.94e-09)	-8.62e-09 (5.24e-09)
invest*cor					0.000750* (0.000402)	0.000128 (0.000536)
invest*econfree					2.37e-05 (2.85e-05)	3.89e-05 (3.80e-05)
Constant	51.12*** (4.529)	49.99*** (5.801)	52.25*** (4.469)	47.66*** (5.852)	48.31*** (4.880)	45.19*** (6.499)
Observations	121	121	121	121	121	121
R-squared	0.677	0.530	0.679	0.511	0.679	0.494

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

⁴⁴ In units of 100 billion constant 2000 US dollars.⁴⁵ In units of 100,000 Kt of oil equivalent.