UNPLUGGED: EXPLORING THE RELATIONSHIP BETWEEN ENERGY ACCESS AND POLITICAL STABILITY

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By

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ABSTRACT

This thesis empirically examines the relationship between political stability and energy access. Using worldwide data from the World Bank, International Monetary Fund, and United Nations, I performed fixed effects regression analysis with political stability estimates as the dependent variable and total electricity rates by country as the main independent variable. The results showed that electrical rates have little impact on political stability, but that economic inequality and gender inequality affect both electricity access and political stability. These results align with previous studies showing inequality’s effect on political stability and violence and show that governments and international actors that wish to reduce political stability and violence need to address inequality and poverty first. The results also indicate that reductions in poverty and inequality will also improve energy access.
ACKNOWLEDGMENTS

An enormous thank you to Professor Eliane Catilina for taking the time out of her busy schedule to advise, edit, and encourage me throughout the nine months of writing this thesis. A special thank you to Eric Gardner who provided me with indispensible help and advice for my data and analytic work as well as to Kersten Stamm who also provided help with my empirical work.
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1. INTRODUCTION

“I want you to try to imagine what it's like to live without electricity. It's boring, for one thing — no television, no MP3 player, no video games. And it's lonely and disconnected as well — no computer, no Internet, no mobile phone. You can read books, of course — but at night you won't have light, other than the flicker of firewood… You may lack access to vaccines and modern drugs because the nearest hospital doesn't have regular power to keep the medicine refrigerated. You're desperately poor — and the lack of electricity helps to ensure that you'll stay that way.”

(Walsh, 2011).

For most of us in the developed world, the thought of living without energy access is unfathomable. Energy and technology are so ingrained in our daily lives, living without modern energy services is incredibly difficult to imagine – especially when frantically searching for an iPhone that has gone missing. Yet access to things like television, the internet, and cellphones obscure our true dependency on energy services. Hospitals, restaurants, grocery stores, gas stations, streetlamps, and libraries would not exist without a stable electrical grid. There is little access to education without energy services, which in turn creates a cycle of poverty with few employment opportunities and therefore few means of escape.

In 2012, the United Nations announced their initiative, “Sustainable Energy for All,” which included the goal of universal energy access by 2030. In announcing this initiative, now former UN Secretary-General, Ban Ki Moon, said energy is “the golden thread that connects economic growth, social equity, and environmental sustainability” (“Secretary-General to Global Development Center”). According to the World Bank Organization (WBO), in 2014, 85.3% of the world’s population had access to basic electricity (“Access to Electricity (% of population)”). This means that over 1 billion people have been left without access to even basic energy services. WBO also estimates that in “fragile and conflict affected” areas, only 46.6% of people
had access to electricity ("Access to Electricity (% of population)"). These numbers are staggering and illustrate how many people have been left behind in the pursuit of economic development across the globe.

It stands to reason that low levels of energy access, and therefore limited access to things like healthcare and education as well as the persistence of extreme poverty, inequality, and limited employment opportunities are a contributing factor to political conflicts around the world. Though much has been done to parse out the relationship between energy, economic growth, and inequality, few researchers have investigated the relationship between energy access and political conflict. This thesis will contribute to the debate and explore the relationship between the two variables.

1.1 Background

Energy poverty is typically defined as a lack of access to energy services — the most frequent measurement is access to electricity and clean cooking facilities (i.e. access to cooking fuel that does not cause household pollution). Due to data availability, this paper will use the percentage of the population with access to electricity using WBO data. Energy poverty is not singularly caused but results from a combination of political, cultural and geographical factors. Some of the greatest barriers to energy access are income poverty, geography, infrastructure, and unreliability of current energy systems as well as a lack of good governance (El-Katiri, 2014). But how exactly energy poverty contributes to conflict is relatively unknown and it seems likely that low levels of energy access play a role in the cycle of conflicts throughout the world.

Political stability is much harder to define. It incorporates everything from political protests to corruption to freedom of press and trust in government. This paper will use the WBO
data, which measures the likelihood of political instability or political violence, including terrorism.

This thesis will explore the complex relationship between political instability and energy throughout the world and investigate how exactly the two phenomena interact with each other. Once that question is answered, we can gain more insight into the best ways to combat energy poverty and secure peace in countries that have long been embroiled in conflict.
2. LITERATURE REVIEW

2.1 Energy Access and Natural Resources: A Resource Curse?

Much of the previous research focusing on energy and the political environment has focused on the presence of a so-called “resource curse,” which theorizes that relying primarily on natural resources for revenue can lead to slow economic growth and development (and therefore implying high levels of energy poverty) (Sachs and Warner, 2001). The empirical evidence for the presence of a resource curse is mixed, however. Some authors have found evidence of a resource curse, but only in conjunction with one or more variables, such as strong institutional quality (Ross, 2015). WBO does not find evidence of a resource curse, but instead concludes that governance quality is a key determinant of a country’s economy and poverty level. It cites the need for improvements in public investment, budgeting, and increased transparency to improve a country’s economic and social conditions. (Canuto and Cavallari, 2012). The research on the resource curse shows that being inherently resource-rich should not be a barrier to economic development, and therefore to the expansion of energy access. Instead, it seems that government quality is a major barrier to economic growth and energy poverty.

Similarly, Laura El-Katiri (2014) has cited that since energy poverty is high even in countries with natural resources, it therefore represents more of a domestic policy problem. Her research focuses on the Middle East and North Africa (MENA) and she asserts that energy poverty is not singularly caused but results from a combination of political, cultural and geographical factors. Katiri lists the greatest barriers to universal energy access: income poverty, geography, infrastructure, and unreliability of current energy systems. Political conflict and instability in governments is the last barrier that the author lists. The article states that energy
poverty “[adds to the] socio-economic neglect that in turn perpetuates and feeds social conflict” (El-Katiri, 2014). Political instability diverts resources away from infrastructure and societal welfare programs that can worsen energy poverty. The author concludes that in order for MENA and other regions to increase energy access, local solutions, especially the use of renewable micro grids, will be the answer. By expanding energy access, societal welfare will be greatly improved. “Political stability and peace are prerequisites for poverty alleviation and long-term investment in energy supply, alongside other sectors promoting economic growth and prosperity democratically, such as universal health and education” (El-Katiri, 2014). Katiri’s article is very strong in theoretical evidence, but she does not provide any statistical evidence for her claims, which will be the focus of this thesis.

2.2 Energy Access and Economic Development

There has also been research focused on the effects of improvements in energy access and how it can affect a country’s growth and societal wellbeing. Media exposure resulting from improved energy access has been shown to have a positive effect on female empowerment and a negative effect on fertility (Bonan, et al., 2015). Improvements in energy access also have the potential to increase investments in public goods such as streetlamps, schools, and health services (Bonan, et al., 2015). Studies have also found that energy access increases employment and the overall labor supply as well as increasing employment opportunities for women (Bonan, et al., 2015). There is also evidence that expansions in electricity access have a significant positive effect on household income (Bridge, et al., 2016).

In the study, “Inequality, Economic Growth and Poverty in the Middle East and North Africa (MENA),” the authors try to uncover the relationship between inequality and poverty in
the MENA region. They find that economic growth in MENA is positively affected by the rate of domestic investment, the rate of urbanization, and infrastructure development (Ncube, et al., 2014). Findings also indicate that a country’s democratic status as well as the quality of its institutions have an effect on household electrical consumption; democracies and countries with strong institutions tend to have higher levels of household electricity rates (Ahlborg, et al., 2015).

2.3 Causes of Political Conflict

Conflicts can be fueled by “demands for more economic and political inclusion [and] protests [have] been largely sparked by a refusal to no longer tolerate the gross socio-economic inequality perpetuated by the long-entrenched ‘elite’ in power” (Ncube, et al., 2014). Inequality can also lead to higher levels of social dysfunction: “Homicide rates are lower and children experience less violence in more equal societies; people trust each other less in more unequal societies; and less equal societies tend to do worse when it comes to health, education and general well-being” (Wilkinson and Pickett, 2010). Inequality has been shown to be a determinant of conflict in many countries (Lessman, 2015). Mark Roe and Jordan Siegel have found that long-term inequality has a strong negative effect on political stability and that this effect subsequently decreases economic development (Roe and Siegel, 2011). Alberto Alesina and Roberto Perotti come to a similar conclusion, asserting “income inequality, by fuelling social discontent, increases socio-political instability. The latter, by creating uncertainty in the politico-economic environment, reduces investment” (Alesina and Perotti, 1995). They also find that countries with higher education levels are more stable (Alesina and Perotti, 1995). Gender inequality has also been found to increase the risk of violence and internal conflict (Caprioli, 2005). David Coady and Allan Dizioli find that expansions in education have a negative impact
on income inequality, meaning that higher levels of education translate into higher levels of equality in a society (Coady and Dizioli, 2018).

Michael Ross has also found a relationship between natural resource wealth and conflict—specifically that the prevalence of natural resources may make political conflict more likely (Ross, 2004). Similarly, Paul Collier, in attempting to dissect the motivations for conflict, has found significant evidence for greed-based theory of conflict rather than a grievance-based theory, such as ethnic or religious divisions. Using a variable measuring primary commodity exports, as well as other economic indicators, Collier finds that economic incentives such as resource abundance and rent-seeking behavior are key determinants of conflict and war. Though Collier finds little evidence that inequality affects conflicts, he does find strong evidence suggesting that increases in education can lower the risk of conflict (Collier, 2000). Indra de Soysa finds evidence that corroborates Collier’s claims and affirms that natural resource wealth increases the risk of conflict and also that mineral abundance has a strong negative effect on economic growth (Soysa, 2000).

As the chief economist of the International Energy Agency, Fatih Birol has said, “Lacking electricity affects, health, wellbeing, and income. It’s a problem the world has to pay attention to” (Walsh, 2011). Not having energy access is not merely not having access to lights; it affects all aspects of life and society and could therefore be a potential cause of conflict. Though much has been said about energy access and societal improvement, as well as the relationship between poverty, economic development and war, little research has been done on how a lack of energy access in a country can lead to political instability. This thesis will investigate the relationship between the two variables. It seems reasonable to conclude that among the many reasons that a country may have domestic conflict, a low level of energy access
and therefore high level of inequality and poverty, seems likely to be a confounding factor.
3. CONCEPTUAL FRAMEWORK

As discussed in the literature review, there seems to be a clear relationship between the expansion of energy access and economic development in a country, but it is unclear how exactly energy access affects political stability. It may be that energy access fosters economic development in a country, which in turn creates more stability within the political regime. Similarly, there is a relationship between inequality and conflict, but past research has focused on mainly on income inequality, rather than in terms of inequality in energy access rates. It seems likely that income inequality is merely a manifestation of energy poverty and misses the vast social consequences that result from a lack of energy access. On the surface, people without access to energy do not have access to things like lights, clean cooking facilities, telephones, and computers. However, people who lack energy access are less likely to have access to things like hospitals and clinics, schools, libraries, and financial institutions which may lead to fewer employment opportunities and therefore, lower income. Therefore it is important to analyze how inequality in terms of energy access impacts conflict.

The core hypothesis of this thesis is that low levels of energy access will lead to high levels of political instability while high levels of energy access will lead to low levels of political instability. This hypothesis is based on the assumption that inequity in energy access will produce social unrest and creates an opening for a political revolt among a country’s citizens.
4. DATA AND METHODS

The thesis assumes a linear relationship: high levels of energy access leads to high levels of political stability and vice versa. Because I am using panel data, it will be important to control for unobservables between countries so I will be using a fixed effects model. Fixed effects will help to eliminate omitted variables or unobservables that are time-invariant and are correlated with variables included in the regression.

The basic regression will look like the following equation:

\[ \text{Political Instability} = \beta_0 + \beta_1 \text{Energy Access} + \epsilon \]

However, there are many other factors that are likely to be correlated with both energy access and political instability that will be important to include in the regression. These include political characteristics of each country as well as social conditions. Below I will elaborate on important variables within each category, which I call “Domestic Governance Indicators” and “Social Indicators.”

4.1 Domestic Governance Indicators

In order to investigate the relationship between energy access and political stability, it will be important to control for differing governance structures within each country. Using WBO data, I will use political stability as my dependent variable. WBO defines this estimate as the perception of the probability of political instability and/or violence, including terrorism in a
country. I will also use the WBO estimate on control of corruption, which it defines as “the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as ‘capture’ of the state by elites and private interests” (“Worldwide Governance Indicators”). I will also use estimates from WBO on government effectiveness, rule of law, and regulatory quality. Government effectiveness is defined as the quality of the public and civil service in a country, as well as the government’s ability to implement and commitment to policies that serve the public interest. Rule of law is estimated as the degree to which citizens abide by laws set by the government and find them credible, especially in regards to property rights and faith in the police force and court system. Regulatory quality, WBO defines as “the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development” (“Worldwide Governance Indicators”). All these variables range from -2.5, which indicates an adverse country score, to 2.5, which indicates political stability and faith in government.

4.2 Social Indicators

The main independent variable, which I am using as a proxy for energy access in a country, is also from the WBO and measures the percentage of a country with access to electricity. It will also be important to control for the social conditions within a country since inequality is likely to affect both access to crucial services, like energy, as well as the stability within a country. I will use two variables to control for this: Gini coefficient data from the United Nations’ Human Development Report and the Gender Inequality Index from the IMF. The Gini coefficient is often used and measures the income inequality within a country. The Gender Inequality Index measures the disparities between females and males within a country, especially
in terms of health, empowerment, and economic success. Both of these variables are measured on a scale from 0 to 1, and higher values indicate more equal societies.

Therefore, the full regression model will look like the following equation:

\[
\text{Political Instability} = \beta_0 + \beta_1 \text{ElectricityRate} + \beta_2 \text{CorruptionControl} + \beta_3 \text{GovernmentEffectiveness} \\
+ \beta_4 \text{RuleOfLaw} + \beta_5 \text{RegulatoryQuality} + \beta_6 \text{Gini} + \beta_7 \text{GenderInequality}
\]
5. REGIONAL ANALYSIS

Before conducting fixed effects regression analysis, I gathered preliminary statistics to understand regional trends in political stability and electricity rates. Table 1 shows that East Asia & the Pacific, Europe & Central Asia, and Latin America & the Caribbean are moving in the hypothesized direction; electricity rates are increasing from the period of 1996 to 2014, while political stability (ranging from -1 as least stable and +1 as most stable) is increasing. In the Middle East & North Africa, South Asia, and Sub-Saharan Africa, political stability is actually decreasing while electricity rates increase. North America saw a static electricity rate of 100 percent between the years of 1996 to 2014, but political stability actually decreased.

Table 1: Regional Trends in Stability and Electricity

<table>
<thead>
<tr>
<th>Region</th>
<th>1996</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate</td>
<td>Index</td>
</tr>
<tr>
<td>East Asia &amp; Pacific</td>
<td>71.74%</td>
<td>0.384</td>
</tr>
<tr>
<td>Europe &amp; Central Asia</td>
<td>99.30%</td>
<td>0.440</td>
</tr>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>85.47%</td>
<td>0.069</td>
</tr>
<tr>
<td>Middle East &amp; North Africa</td>
<td>89.91%</td>
<td>-0.360</td>
</tr>
<tr>
<td>North America</td>
<td>100%</td>
<td>0.963</td>
</tr>
<tr>
<td>South Asia</td>
<td>45.37%</td>
<td>-0.662</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>25.07%</td>
<td>-0.522</td>
</tr>
</tbody>
</table>
6. REGRESSION ANALYSIS

6.1 Drivers of Political Stability

Table 2: Drivers of Political Stability

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>DEPENDENT VARIABLE: POLITICAL STABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Series (1)</td>
</tr>
<tr>
<td>Total Electricity Rate</td>
<td>0.000249</td>
</tr>
<tr>
<td></td>
<td>(0.00162)</td>
</tr>
<tr>
<td>Rule of Law</td>
<td>0.640***</td>
</tr>
<tr>
<td></td>
<td>(0.0498)</td>
</tr>
<tr>
<td>Regulatory Quality</td>
<td>-0.00883</td>
</tr>
<tr>
<td></td>
<td>(0.0415)</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>0.207***</td>
</tr>
<tr>
<td></td>
<td>(0.0475)</td>
</tr>
<tr>
<td>Control of Corruption</td>
<td>0.134***</td>
</tr>
<tr>
<td></td>
<td>(0.0433)</td>
</tr>
<tr>
<td>Gini Coefficient</td>
<td>2.402***</td>
</tr>
<tr>
<td></td>
<td>(0.505)</td>
</tr>
<tr>
<td>Gender Inequality Index</td>
<td>0.768***</td>
</tr>
<tr>
<td></td>
<td>(0.195)</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.863***</td>
</tr>
<tr>
<td></td>
<td>(0.327)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,032</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.249</td>
</tr>
<tr>
<td>Number of Countries</td>
<td>141</td>
</tr>
</tbody>
</table>

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

Using a fixed effect model, Table 2 shows the results of regression analysis in which political stability is the dependent variable, total electricity is the main independent variable, and
various other variables are included for control. Column one shows a simple fixed effect regression with all countries included, and column two shows the same regression but using the cluster effect to control for correlation in the standard errors over time (thereby increasing standard errors while coefficient remain the same). The third column is the regression with the cluster effect but including only non-OECD countries, and the fourth column is only OECD-countries.

In each regression, the total electricity rate variable was not significant, meaning that a change in a country’s electricity rate has little impact on political stability. This is a surprising result considering that the literature shows that inequality is a major driver of political conflict, which is supported by the results in Table 2, and high levels of inequality would imply low levels of energy access. The results, however, show that electricity rates have little effect political stability and do not support my original hypothesis. Similarly, regulatory quality does not have a significant effect on political stability. This too is surprising, because it is reasonable to think that countries that have a stronger and more credible ability to implement policies and pursue development would be more politically stable. However, the results do not support this claim.

Unsurprisingly, the rule of law variable is significant at the 1 percent level and is positive in all four regressions, meaning that an increase in the rule of law in a country increases political stability, holding all else constant, which intuitively makes sense. Similarly, government effectiveness, control of corruption, and the gender inequality index variable are positive and statistically significant (at varying levels) in the first three regressions, but not in the fourth. The Gini coefficient variable is significant and positive in the first and second regressions, meaning that as a country becomes more equitable, political stability increases. The inequality results, both in terms of the Gini coefficient and the Gender Inequality Index are very important and
indicate that targeting and improving inequality in countries will have a positive impact on political stability, which will be discussed further in the next section.

6.2 Drivers of Electricity Access

Table 3: Drivers of Electricity Access

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Total Electricity Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Stability</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
</tr>
<tr>
<td>Rule of Law</td>
<td>-4.860</td>
</tr>
<tr>
<td></td>
<td>(2.48)*</td>
</tr>
<tr>
<td>Regulatory Quality</td>
<td>0.862</td>
</tr>
<tr>
<td></td>
<td>(0.59)</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>-4.133</td>
</tr>
<tr>
<td></td>
<td>(2.89)**</td>
</tr>
<tr>
<td>Control of Corruption</td>
<td>0.158</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
</tr>
<tr>
<td>Gini Coefficient</td>
<td>74.156</td>
</tr>
<tr>
<td></td>
<td>(2.68)**</td>
</tr>
<tr>
<td>Gender Inequality Index</td>
<td>-5.166</td>
</tr>
<tr>
<td></td>
<td>(0.77)</td>
</tr>
<tr>
<td>_cons</td>
<td>28.393</td>
</tr>
<tr>
<td></td>
<td>(1.68)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.41</td>
</tr>
<tr>
<td>$N$</td>
<td>2,032</td>
</tr>
</tbody>
</table>

Standard errors in parentheses

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

To gain better insight into the factors that contribute to and best explain a country’s total electricity rate, I did another fixed effect regression with the cluster effect where the total electricity rate is the dependent variable, which is shown in Table 3. In this case, rule of law is
statistically significant at the 10% level but is actually negative, meaning that an increase of one
unit in the rule of law variable is associated with a decrease of 4.86 percentage points in the total
electricity rate, holding all else constant. Similarly, government effectiveness, significant at the
5% level, is also negative suggesting that an increase in government effectiveness decreases a
country’s total electricity rate by 4.133 percentage points. This is a surprising result, because it
would be reasonable to think that strong a rule of law (and enforcement of property rights) as
well as government effectiveness would be necessary for the provision of public goods, such as
electrical infrastructure. However, the results show that this is not the case.

The Gini coefficient variable is significant at the 5% level and suggests that an increase
in one unit (going from 0, the most inequitable, to 1, the most equitable) increases the total
electricity rate in a country by 74.156 percentage points. The results of the Gini coefficient
variable seem to make intuitive sense—as a country becomes more equitable, more people gain
access to electricity. These results are important, as it shows that reductions in inequality and
programs that target the poor will have great impact on energy access. However, the results of
government effectiveness and control of corruption are puzzling and will take further analysis to
uncover the true relationship.
7. LIMITATIONS OF ANALYSIS

One of the main challenges in this regression analysis was the limitation on the availability of worldwide, accurate data. Though I was able to utilize total electricity rates from the World Bank, these numbers do not represent the full scope of energy access. For one thing, energy poverty is defined as household access to electricity as well as access to clean cooking facilities, for which I could not find comprehensive worldwide data. Another issue is that though the variable for total electricity rates measures the percentage of the population with access to electricity for each country, it does not take into account things like grid stability and blackout rates (for which there is very limited data). For instance, in the data, the West Bank and Gaza/Palestine has an electricity rate of 100% in my dataset, meaning that all people living in the region have access electricity. However, this figure does not take into account that there are electricity blackouts between 12 and 20 hours per day in Palestine (Lieber, 2017). This leaves people without access to crucial services, especially medical care and is likely to feed into political unrest.

Without accurate worldwide data, the relationship between political stability and energy access may continue to be obscured. We cannot determine what the regression results would be if a grid stability variable was able to be included; it could be that electricity may have more of an impact on political stability if this were the case. However, though the results do not entirely prove my initial hypothesis, they still show the importance of inequality, including gender inequality, as a significant driver of both political stability and energy access, which has important policy implications.
8. POLICY IMPLICATIONS

The regression results I found have far reaching implications in the field of domestic and international policy. In light of my findings, when pushing for energy access and political stability, policy actors should focus their efforts on combating inequality and, in particular, gender inequality.

The regression analysis results from the previous section show that inequality affects both political stability as well as electricity access, as the Gini coefficient variable was significant for most regression series. This has important policy implications and the results align with previous research discussed in the literature review that point to inequality as a driver for conflict and civil war. This analysis means that governments and international actors that wish to reduce political stability and violence need to address inequality and poverty first. Political actors should turn their focus towards enforcing redistributive policies that foster equality across income classes as well as increased spending on the provision of public goods. This could include implementing progressive tax systems where wealthier individuals are taxed at higher rates, equal education access for all income levels, infrastructure investment, as well as putting social safety nets in place. It could also include expanding access to employment support services such as job training programs as well as implementing economic diversification programs to increase employment opportunities and ensure that citizens have access to a stable and fair income. Though the regression results did not show the hypothesized effect, energy access, especially to clean energy sources, is still an important policy goal and its expansion throughout the world is likely to reduce inequality and therefore reduce political instability and violence. Wind and solar energy through distributed micro grids, especially in rural areas that
have little to no access to energy, will likely have a huge positive impact on daily life and societal wellbeing.

Gender inequality was also shown to affect both political stability and electricity access, suggesting that policies that promote gender equality will lead to positive development outcomes. These results seem intuitive; countries that are highly inequitable are likely to also have high levels of gender inequality, making society more fractionalized and less cohesive and therefore more prone to instability. Similarly high levels of inequality are likely to mean low levels of energy access, because there is less emphasis on distributive or pro-poor policies. Governments and international actors should continue to press for worldwide gender equality in an effort to promote peace. This could include ensuring equal access to primary and secondary education, policies that increase literacy rates among girls and women, as well as the expansion of access to quality maternal healthcare and family planning services, among others.

Rule of law and control of corruption were also significant in some of the regression series. Obviously these are important traits for countries to strive for, but they are difficult to achieve if there is not significant resolve within a country to change the norms within the government. If there is widespread corruption within various levels of the public sector, it is unlikely to be changed by government actors themselves without pressure from the population at large as well as the international community. Similarly, it is extremely difficult to set up institutions that foster the rule of law; a country needs an accountable police force, a just court system, strong enforcement of property rights, as well as the support and trust of the people in the institutions themselves. These are factors that take a very long time to change and though international actors can attempt to influence them, these characteristics are unlikely to be transformed if average citizens do not play an active role in their transformation.
9. NEXT STEPS

One of the curious findings from my empirical analysis was that the rule of law and government effectiveness variables had a negative impact on total electricity rates, which seems counterintuitive. It seems that especially government effectiveness should have a positive influence on energy access; if the government is effective in a country they are likely prioritizing the spending on public goods like infrastructure, education, and stable energy access. This correlation needs to be analyzed more and will need further econometric analysis in order to investigate the true relationship.

Another area that needs to be further researched is how exactly grid stability plays into the relationship between energy access and political stability. A possible hypothesis is that once grid stability is accounted for, the relationship between energy access and political stability will be significant. Until there is more worldwide data on the reliability of electrical grids the true relationship may be difficult to uncover. However, case studies in places like Israel and Palestine could be extremely useful in gaining better insight into the role of grid stability.
10. CONCLUSION

The original hypothesis of this thesis was that higher levels of energy access would be associated with higher levels of political stability and vice versa. Though the empirical analysis does not support this hypothesis, there is still more research to be done on how exactly political stability and energy access interact with each other, especially with regards to incorporating measures of grid stability. The analysis provided important conclusions on how economic inequality and gender inequality impact both electricity access and political stability and therefore has important policy implications. The millennial development goal of universal energy access is still incredibly important. Expansions in energy access, especially in terms of clean and renewable energy access, will work to reduce economic and gender inequality, which in turn will create more stable and less violent countries. This analysis should incentivize political actors and international organizations to promote and implement pro-poor and gender equalizing policies that will result in expanded energy access for all and political stability throughout the world.
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