The Impacts of Mine Ownership on Long-Run Economic Standing In Bolivia

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Abstract

This paper investigates the long term economic impact of the Spanish Mita system on Bolivia. The analysis is based on a comparative approach using areas that were subjected to the Mita (e.g., Ororu) as a treatment group and using areas that had primarily community owned mines as a control group (e.g., La Paz). The research design employs a boundary discontinuity regression framework, leveraging the Cordillera Real mountain range as a natural geographic boundary. Limitations of historical and contemporary data hindered the ability to conduct the regression analysis but qualitative approaches were taken to ensure the question was adequately answered. The study builds upon the prior findings of Melissa Dell and Daron Acemonglu et al., that regions under extractive colonial rule exhibit worse long run economic outcomes. Dell's quantitative findings are leveraged to theorize the regression output from this study. The study underscores the impact of extractive institutions and provides recommendations to rectify them.

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Note to Reader: This paper has allowed me to uncover a pressing issue in our world. I am thankful for the lessons I have learned throughout the econ 970 course and I felt adequately prepared to address this research question. While I was unable to access the data I needed to carry it to completion, I believe that I still reaped the benefits that this project intended to teach. Additionally, I would like to thank Nikhil Kumar, PhD candidate. The guidance he provided allowed me to learn much and demonstrate those skills in my paper. I want to give a special thank you to Melissa Dell, Daron Acemonglu, Simon Johnson, and James A. Robinson. Their work gave me the ability to formulate my research question and conduct my analysis.

Introduction:

This paper is a research project outlining the steps and the methodology that would be used to solve the impact of the Mita mining system in Bolivia. The research question was motivated by a similar study conducted by Melissa Dell on the impacts of the Mita mining system in Peru. While this study seeks to outline the quantitative approach that would be taken to see the impacts of the Mita system, qualitative conclusions can be drawn on the broader implication that extractive institutions have on the long run development of a region. The research paper is separated into a background section, literature review, motivation, hypothesis, research design, regression explanation, and the conclusion. A helpful table of contents is located after the title page to allow for ease of maneuvering throughout the paper. Additionally, below I will discuss what will be covered in each of the sections.

The **background section** covers the pertinent historical information that is needed to digest the research study; This section is intended to introduce and explain the information that enables understanding of the Mita mining system. This section touches upon the time frame of the Spanish's conquests to South America and the geographical movement of the Spanish conquests. A large focus of this section is a geographical explanation of the area of interest as well as the geographical barriers that hindered the Spanish conquests into all regions of Bolivia. The geographical explanation provides details on why the boundary discontinuity design of the research study is feasible. Lastly, the background section explains the two areas of interest that this study focuses upon, Oruro and La Paz, as well as the motivation behind their selection. In essence, this section prepares the reader with the necessary information for the study.

A **literature review section** is subsequently placed after the background section to provide additional details on the region and past information that previous scholars have compiled that will be leveraged in my study. The two literature reviews I conducted were Melissa Dell's *The Persistent Effects of Peru's Mining Mita* and Daron Acemoglu, Simon Johnson, and James A. Robinson paper, *Institutions as a Fundamental Cause of Long-Run Growth*. Pairing both of these papers together allowed for a comprehensive look at institutions and the effects on the long term development of the region. Melissa Dell looks directly at the Mita system in Peru, which is helpful for understanding the quantitative findings of the long run impacts of the region. Acemoglu, Johnson, and Robinson take a global approach to understanding the impacts of institutions. They theorize the depth that institutions have on long run impacts by pulling in examples from previous civilizations such as the Aztecs and the Incas as well as

more contemporary examples such as Korea. The literature review provides the pertinent information to develop a thought out hypothesis.

While the question of the study has thus far been developed through the background and literature review section, the **motivation** section broadens the question by explaining the broader implications of why understanding colonial extractive institutions are important. While the majority of the research study focuses on Bolivia, this section takes a more macro approach. The intention of this section is to iron out the more philosophical questions regarding political steps to ensure the equity of regions whose growth might have been hindered by historical colonialism.

A **hypothesis section** is included to decisively state what I theorize would occur by conducting the overall study. The conclusion that I reached would be that we will see areas that were subjected to extractive colonial institutions would have growth hindered in the long run. In this section I also evaluate factors that would result in the rejection of my hypothesis. Historical information from the background section is leveraged here to provide a holistic approach to the research question.

After my hypothesis is delivered, I discuss the mechanisms of the quantitative approach of this study. This section is called the research design section. This section aims to deliver a high level overview of the steps taken and the factors considered when formulating the equation. Building upon the information laid out in the research designed section there is a **regression approach** section. In this section I evaluate several methodologies that could be used, such as a Differences in Differences approach, a simple regression analysis, and the methodology of choice being a boundary discontinuity. There is a thorough evaluation of the pitfalls and benefits of each approach. The boundary discontinuity regression is outlined. The dependent, independent, and control variables are explained in detail. A deconstruction of the equation is done to ensure adequate explanation is provided. A precursor to the data limitations is discussed as well as an explanation to why the regression was unable to be run; This explanation will be further expounded upon in the data analysis section.

The **data analysis** section discusses the current limitations of the data and the steps that should be taken in order to acquire the necessary data. Within this section as well there is an explanation of why certain data points were chosen. Within this section I also delve into the methodologies that should be used when ensuring the cross compatibility of the data between the treatment and the control.

The main aspect of my paper is the **analysis**. This section begins with a further explanation of the limitations of my data. After that is completely established I utilize the work from Dell's paper to theorize what I believe would occur in my paper. In this section I provide an overview of the certain aspects of my project that were limited from the lack of data and provide a theoretical explanation of the steps I would take if they occurred. I end this section by working under the presumption that my hypothesis is correct and what are the broader implications.

The **conclusion** aims to wrap up the entire paper and reestablish all the points I made throughout the other sections. After the **conclusion** is the works cited page where I give adequate credit to the work I used.

Background:

Early in the 16th century, the Spanish conducted a series of conquests and explorations in South America. While the conquest began in Peru, the Spanish quickly spread out to surrounding regions, one of which being present-day Bolivia. Upon reaching Bolivia, the Spanish quickly uncovered knowledge of the region's vast abundance of silver—the indigenous people in this region had already known this. The Spanish found the most abundance in the Potosi region located in the Andes mountain range along the western edge of the country. The loot was so great that the region became known as the Spanish empire's "silver mint." In order to extract said silver, the Spanish crown established a slave labor system called the Mita system. The Mita system was the coercion of indigenous communities, aged eighteen to fifty, for the sole purpose of working in Spanish owned mines in the high output South and Southeastern regions. Indigenous populations were forced to send one seventh of their male population to work in the silver mines. Due to the scale of these mines, locals began to migrate to meet the demand, forming new cities such as Oruro that were largely controlled by the Spanish.

The La Paz region, however, was untouched by the Mita system. Located in the North-Western part of the Andean highlands, the La Paz region escaped the Mita system due to its inaccessibility and the Spanish crown misjudging its potential abundance. The Spanish were wrong, and the region did indeed offer rich deposits of silver–a fact that the indigenous people of the region understood, and, as such, they were able to extract the ore and trade it throughout their own community.

Both Oruro and La Paz are situated on the Altiplano plateau, just in vastly different sections. Travel from one area of the Altiplano plateau to the other section of the Altiplano was very difficult before the innovation of transportation technology. A large geographical feature that separates the regions is the Cordillera Real. This is a mountain range that makes travel from Oruro towards La Paz extremely difficult during the time period the mita mining system was instituted and thus prevented the Spanish from colonizing this region.

By using colonial mining (such as the Oruro) as a treatment group and comparing it to community mines (such as the La Paz region) as a control group, this paper hopes to determine the impacts of extractive colonial mining systems. In colonial mining regions, the indigenous communities were either immediately mistreated by the profiteering colonists, or forced to uproot to regions where they would then face the same consequence. Conversely, indigenous mining communities had a vested interest in the impacts of the mining and used the economic gain to build surrounding infrastructure. While the

mining of both of these region types has changed notably over time, the early establishment of the ruling class impacts the economic and social standing of the regions for centuries.

The Mita system ended in 1825 with Simon Bolivar decreeing Bolivia's independence. Despite the rich natural endowment of the region, Bolivia as a whole has struggled economically on the national stage. This paper seeks to uncover if the impact of the Mita system is to blame for some regions poor economic standing or are there other factors at large.

Paper Review's:

Paper Review- *The Persistent Effects of Peru's Mining Mita*, Melissa Dell:

In her paper, "The Persistent Effects of Peru's Mining Mita," Melissa Dell uses a regression discontinuity to look at the long term economic impacts of the Mita mining system in Peru. Although the Mita mining system occurred in both Peru and Bolivia, this paper focuses solely on Peru. Melissa Dell cleverly applies the natural geographic factors in her research design: since the Andes mountains separated the Mita regions of the Highlands to non-Mita regions, Dell is able to use a boundary discontinuity. Though Dell does not name specific districts, these regions were separated into Mita districts and non-mita districts. Dell's paper seeks to answer several questions: how did the Mita influence long run economic standings of the regions, how did the Mita influence the health of the region, through what channels did the Mita affect long run development, and are the outcomes between Mita regions compared to non-Mita regions indicative of the influence of extractive institutions on economic development?

The principal data sources used by Dell are the Peruvian National Household Survey (2001) for consumption data and data from the Ministry of Education. Aside from the traditional quantitative data sources, Dell also uses historical Spanish maps to understand the Mita mining system. The major dependent variables Dell uses are the log of household consumption, prevalence of subsistence farming, and childhood stunting. There is an indicator variable used; if the area subjected to the Mita system the variable has the value of a 1 and for non Mita regions has a value of 0.

The overall economic outcome concluded that household consumption in Mita districts is 25% lower than in non-Mita districts. This consumption gap is still persistent despite the length of time since the Mita was implemented. This finding supports the broader theory that extractive institutions hinder the long-run development that was established by Acemoglu and Robinson— Dell intertwines Acemonglu and Robinson's theory throughout her piece, leading me to believe that their work potentially had a role in her establishing her own hypothesis. As for health and nutritional outcomes for children, Dell's study indicates that children in Mita districts are six percentage points more likely to be stunted compared to children in non-Mita districts. This indicates overall worse health outcomes due to the extractive colonial

institutions established by the mita system. Dell also uncovered that due to communal land tenure systems established by the Spanish in Mita regions, the indigenous people of the region never truly possessed fertilized property rights. As such, when the Mita ended land ownership of the region, it was uber vulnerable. This low land ownership caused lower economic outcomes of the region as well as less infrastructure in the surrounding region. In comparison to non-Mita regions, there were more formalized land rights; hence long term investment was encouraged. Dell concludes that the Mita system had lasting impacts on economic development, health outcomes, and the institutional structures of the Peruvian regions that the Mita had established. Dell therefore claims that there is support to Acemonglu and Robinsons' claim that extractive colonial institutions have a negative impact on long run development.

In terms of how Dell's paper relates to my proposed research project, I believe that there are several parallels and it is the inspiration for my overall project. While Dell focused primarily on Peru, the Mita system was also established by the Spanish in Bolivia. I seek to replicate this experiment on the regions in Bolivia but potentially use different dependent variables such as GDP per capita. I believe that, by comparing my findings to Dell's findings, there is potential to strengthen her and Acemonglu and Robinson's claim. If there are different findings, I believe that it could indicate the role that the modern day government plays in rectifying the impact of colonial institutions on their country.

Paper Review- ***Institutions as a Fundamental Cause of Long-Run Growth*****, Daron Acemoglu, Simon Johnson, and James A. Robinson-**

In their paper, Acemoglu, Johnson, and Robinson look at the impacts that institutions have on the long run economic growth of a country. Specifically, economic and political institutions are looked at. This is important to my study since the Mita system was an economic colonial extractive institution that the Spanish implemented; By learning from previous case studies of other countries that this paper looked at I will more accurately be able to hypothesize the economic impacts of the Mita system. While the previous paper I discussed took a more granular approach to this problem focusing on only one country, this paper takes a global comparative approach. Throughout the paper the authors establish a theoretical framework that pairs the quality of the institutions to the economic outcomes depending on if the institutions are inclusive or extractive. The empirical data that is leveraged throughout the paper is property rights protection and GDP per capita.

A very common theme throughout this paper is the design of the specific institutions. Some institutional designs enable and encourage economic growth while others hinder it. In addition to the impacts of the extractive versus inclusive institutions, the rationale behind developing such institutions is contemplated. A cyclical relationship between the design of the economic system and the design of the political system is spoken about.

The authors use the historical division of Korea as empirical evidence for their case study. North and South Korea, while being culturally similar, have vastly different modes of governance. This allows for a comparative analysis on the impacts of the institutions on long run economic development. South Korea takes a more inclusive approach to both their economic and political institutions while North Korea takes a more extractive approach. Both the extractive and inclusive institutions were instituted at the same time due to the war that resulted in the divergence of the regions. In the long run we see South Korea reap much better economic outcomes than its counterparts. North Korea has experienced a large amount of economic stagnation and poor quality of life. This indicates that extractive institutions hinder long run economic growth for the time that they are instituted within the region.

Acemoglu, Johnson, and Robinson also look at the impacts of the institutions after they are no longer implemented. They use a term coined the "Reversal of Fortune" to explain the phenomenon of pre colonial societies that had high economic prosperity that were then colonized. This phenomena shows that these areas are now less-developed on average, despite no longer being subjected to colonization. The Aztec and the Incas were used as examples since they were conquered by European powers and forced into colonization similar to the mita system. Now we see they have hindered economic growth and outcomes despite the colonization ending centuries ago. The concept of the "Reversal of Fortune" is particularly interesting to my study since this is very similar to why it occurred in Bolivia.

In addition to the institutional hypothesis that is laid out, the authors also evaluate several geographical and cultural hypotheses that could also play a role in the hindrance of countries economic outcomes. The authors conceded that geography can potentially play a role in delayed economic growth of a region but there are a few exceptions of regions that were able to develop in spite of unfavorable climate. Regardless, due to technological advancements and the length of societies, these factors should no longer be affecting the economic or political systems; Instead this points back to the importance of institutions. The cultural argument laid out points to how cultures can influence the growth of a community. For instance, religious cultures can have more long run growth due to a higher emphasis placed on the development of their regions. The author's critique of this is that cultural norms can affect economic behaviors but these norms are still shaped by historical and institutional context.

In conclusion, this paper helped me understand through several case studies and instances the impacts of extractive institutions. This allows my hypothesis to be grounded in the adequate historical context that is needed. Additionally this paper allowed me to consider the factors that should be looked at in order to quantifiably compare and contrast my regions of interest.

Motivation:

By understanding the impact that colonial extractive mining has on the long run economic outcome of a region steps can be then taken to mitigate the lasting effects. For instance, if a region were

subjected to colonial mining and consequently faced stunted infrastructure growth, the region's government could then focus their efforts on rectifying the issue. If there were a uniformed issue across all mining regions, then a uniformed approach could be taken, but if there were heterogeneous effects, then a heterogenous approach must be taken. This study aims to look at the impact of Mita mining on towns within Bolivia, since if there are worse outcomes in these regions additional aid can be provided to increase equity.

Ores are a finite resource, but due to the potential prosperity at hand, towns sprout around large deposits. However, even when the mines are no longer operational, the towns still exist. If the towns are reinvested in, then the succeeding generations of the people will not have the same opportunities as other people in the country. By knowing the impacts of the mining operations that were conducted in Bolivia, the government will therefore be able to allocate both resources and attention to ensure that they are not perpetrating the same impacts as the historical colonial extractive system. It should be noted that it is certainly plausible that there are homogenous effects observed, which will indicate that, regardless of type of mining, there are negative impacts on the region; however, even this finding will help guide decision making to aid these regions.

Hypothesis:

My research project hypothesizes that regions in Bolivia that were subjected to extractive colonial silver mining have hindered economic outcomes experienced by their local population. The control group for this hypothesis is a region, La Paz, that reaped the majority of their growth from silver mining while being wholly native owned. I hypothesize that regions that were natively owned had more of the money made from mining placed back in infrastructure, in contrast to areas that were solely owned by the Spanish empire, where the principal goal was extracting and exporting the resource. By comparing the La Paz region as a control group to the Oruro region as the treatment group I believe we will see the household per capita income higher in La Paz than in Oruro. This finding would be indicative that the Mita system resulted in hindered long run economic outcomes for residents that reside in historical colonial extractive regions.

The hypothesis will be tested on a spatial boundary discontinuity regression. I hypothesize that when using the Cordillera Real mountain range as the boundary, due to reasons that will be discussed in the research design, we will see that the La Paz region has better economic outcomes in comparison to Oruro. In order to responsibly test this hypothesis, factors will need to be controlled for so we can be sure that the hypothesis is not being inadequately accepted or rejected. Those variables will be discussed in the research design and the regression section. Regardless, when those variables are controlled for I believe that we will see what both Dell and Acemoglu, Johnson, and Robinson found.

This hypothesis was formulated from doing extensive research of the surrounding area and from building upon previous research conducted. The research that I built upon is exhaustively laid out in the paper reviews but there are a few points to mention. Firstly, Melissa Dell's research paper on the Mita system in Peru was very helpful. Namely, Dell found that areas that had the Mita system implemented had 25% less household consumption. While my study focuses on household income per capita, I theorize that there is a correlation between household income and consumption. That being said, I believe Dell's findings are indicative that my measure of economic prosperity, household income per capita, too will indicate the negative effects of the Mita system.

The Acemoglu, Johnson, and Robinson paper pairs extremely well with the Dell paper in helping me formulate my hypothesis. While initially I was concerned that the effects we see on the long run effects of the Mita system in Peru could be attributed to cultural differences, the Acemoglu, Johnson, and Robinson paper allows me to confidently believe otherwise. Acemoglu, Johnson, and Robinson in their paper indicate that cultural differences can cause different societies to have different economic outcomes; The reasons for those cultural differences are likely attributed to the institutions implemented within the region. With Bolivia and Peru both being subjected to the same extractive institutions I hypothesize that there will be little cultural differences that can cause extenuating differences.

While I have good reason to believe my hypothesis will hold, there are always instances of outliers and it is important to consider the factors that can cause this research study to be one. This hypothesis may not hold for, after the Spanish left Oruro, the vast number of people remaining in this region allowed for more growth of infrastructure. The oppressive spanish regime could have unintentionally caused increased innovation within the region. The people they force assimilated could have shared knowledge and expedite the cycle of innovation. While immediately after the Spanish left the economic situation would have been more dire in Oruro than La Paz, in the long run there is potential for Oruro to reap the benefits of forced diversity. In addition to the potential for innovation there is also population density. A higher population density, with little migration, allows for innovation and growth to happen at a higher level. La Paz, which was never under the Mita mining system, also did not ever have their population growth stimulated by an external force. It is very plausible that although the economic outcomes directly after the Mita mining system were dire, over time the shock of colonization diminished and there are now no longer any lasting effects. While the Spanish did not build much sustainable infrastructure during their time with the Mita mining system, the post-colonization period could have caused a vacuum of need for the "low locals" to fulfill. Lastly, there is potential that the political instability of the country could have hindered growth from both regions. The hindered growth could have been equally felt by both regions and muted any economic divergence from the respective regions.

This hypothesis will be confirmed or denied by running the outlined regression. Regardless of the results of the regression, it is important to keep in mind the extenuating factors that can cloud the results.The historical and scholarly precedent laid out from Dell, Acemoglu, Johnson, and Robinson allows for a good direction for this project to progress upon. It is important to be critical of such findings so that the research project is not biased from previous work.

Research Design:

The research question is based around understanding the impacts of the Mita system on the long run economic prosperity of cities in Bolivia. In order to answer the question two cities with differing histories were chosen, Oruro and La Paz. Oruro will be used as the city that was impacted by the Mita mining practice while La Paz will be used as a control for areas that still had mining but were not subjected to the Mita mining system. The location of the cities selected for this study were strategically done to leverage the geographical barriers. The Andes highland area is the perfect region to answer this question due to the same geographical barriers that separate the Southern and Northern regions are the same ones that prevented the Spanish from instituting the Mita system. Both of these regions have similar natural endowment, but the natural barriers help prevent the Northern region from being colonized and forced into the Mita mining system. The central hypothesis is that we will see less economic prosperity in Oruro, which was subjected to extractive colonial mining practices, compared to La Paz which had indigenous ran mining.

The experiment is based upon being able to view household income per capita as an indicator of the economic standing of a region. I decided this would be the best proxy for economic standing of a region for this equation because it allowed for me to account for the most controls ensuring that the opportunity for OVB is as low as it could be. The variables within the equation that are controlled for are whether or not the area has Mita mines, what the distance is to the nearest region metropolitana, what is the population density of the region, and how far the individual mine is away from the boundary line. The measure of distance to the nearest region metropolitana will be measured from the most dense region of population in one city, La Paz or Oruro, to the nearest city that is classified as a region metropolitana. Both Oruro and La Paz are considered region metropolitana's , but the purpose of this measure is to account for their proximity to other important economic hubs. This distance will be measured in kilometers. The measure of population density that is used in this equation will be in terms of the number of people per square kilometer. Lastly, the measure of distance to the boundary line will be measured in terms of location of the mine to the boundary. The boundary that will be used will be a midpoint between the closest Oruro mine and La Paz mine to the Cordillera Real mountain range; This distance too will be

measured in kilometers. For all the measures it is important to have a standardized unit of measurement and I deemed the metric system to be the best choice since it is the standard unit of measure in Bolivia.

The data is not needed on a per mine level but instead just from the area that the mines caused settlements in. This is why the number of mines of the region are not included in the equation. There were both several mines in La Paz and Oruro but the end goal is understanding the current standing of the settlements that sprouted up around them. To ensure that the right regions are being surveyed historical maps from the district of Bolivia will be measured to establish the boundary lines that need to be surveyed. The current lines of the cities are not consistent with the historical lines so satellite technology can overlay the historical maps on the region to establish the boundaries that should be surveyed. After that is completed the data can be utilized and regression analysis can take place.

Regression Approach

The approach that I believe should be taken to empirically solve this problem, if the data was available, would be a boundary discontinuity. A boundary discontinuity approach could be taken since the type of variation across the region is spatial and centered around a distinguishable boundary line. The comparison groups are Mita areas versus non Mita areas near the natural geographic boundary. This allows for the geographical barriers that hindered the Spanish's conquest to be leveraged; While both areas will still be similar enough for significant conclusions to be drawn. When considering what type of

equation would best solve this question I also evaluated a difference in differences (DiD) approach as well as just a simple regression. A DiD approach requires data from pre-intervention and post-intervention. This is not possible in this instance since there is not a canonical event that can be studied. In order to look at the impacts of the Mita mining system with a DiD approach the canonical event would have to be the Spanish's conquest into Bolivia. This can be very pragmatic when trying to look at the impact of the colonial mining system since it would require comprehensive data over time; This data would need to be conducted from the start of the Mita mining system to the modern day. This would be highly unlikely due to incomplete historical data in both the regions. Taking a difference in differences approach would require panel or cross sectional data that is highly unlikely to exist. A simple regression would not be the best choice in this instance as well since it fails to account for spatial or contextual differences such as the ones observed in this situation.

The limitations of both a simple regression and a DiD is why a boundary discontinuity is the equation that I believe is best in this situation. While it is best in this situation, there are still some downsides that must be kept in mind. There could be unobservable discontinuities at the boundaries that impact the results. Examples of these could be environmental or cultural differences. In order to ensure that these are not impacting the equation control variables must be added and robustness checks should be conducted. Additionally, these results could potentially not be able to be generalized beyond the boundary. Since only the regions of Oruro and La Paz are being compared, there is a chance that the results would differ in other regions. To address this, different regions would need to be studied. Lastly, there can be differences in sample sizes of the regions near the boundary To address this I am using population density as a proxy. The potential pitfalls of a boundary discontinuity research design does not dissuade my opinion that it is the best course of action in this instance. It is important to keep the potential problem that could arise in mind so that the results could be looked at critically. The geographical factor that will be leveraged from the spatial boundary discontinuity is the Cordillera Real mountain range. This mountain range was the barrier that prevented the Mita system from being expanded to La Paz. With the geographical barrier being the line of discontinuity, this allows for the experiment to be pseudo natural.

Equation:

$$Y_{id} = \beta_0 + \beta_1(Mita\ Mine\ Indicator)_{id} + \beta 2(Distance\ to\ RM)_{id} + f(Population\ Density)_{id} + f(distance\ to\ boundary)_{id} + \varepsilon_{id}$$

The equation above is the one that will be utilized to look at the impact of the Mita mining system. Y_{ib} is the outcome variable of interest. The subscript variables i and d are indicative of the district segment and

the observation. For this study the outcome variable of interest is household income per capita β_0 is the intercept of the equation. $\beta_1(Mita\ mine\ indicator)_{id}$ is a binary indicator variable that will take the place of 1 if the region being tested is a Mita mine; If the area is not a Mita mine region it will take the place of a 0. The next variable in the equation is $\beta_2(Distance\ to\ RM)_{id}$. This is included to account for the surrounding regions of the treatment and control that could influence the equation. Proximity to other region metropolitana will influence that area's ability to conduct trade as well as access to jobs. $f(Population\ Density)_{id}$ is included to account for any influence that population density of a region could have on household income per capita. A polynomial approach will be taken and due to the complex relationship that population density can have on household income various forms of the polynomial could be explored. In order to explore these forms adequate data is needed. A similar approach is taken with $f(distance\ to\ boundary)_{id}$; There is a chance that there is not a linear relationship in regards to household income per capita so a polynomial approach will be explored. I decided to take this approach rather than using a fixed effect that would explore the impact of varying differences. I do not predict there will be much variation from different boundary sections. If after I get the data there were to be signs that there are differences across boundary sections I would then include the boundary fixed effect variable ϕ_{ib}. This equation was inspired by the one that Dell laid out and adequately built upon to address my research question. Below I will discuss the reasons for including the individual variables specifically:

$Mita\ Mine\ Indicator_{id}$: This is a binary variable that will only affect the equation if the observations in district *d* are from a Mita region. Therefore for Mita regions it equals 1 and for non-mita regions it will equal 0. This is intended to look at the impacts of how the mita impacts the variable of interest, household income per capita Y_{id}

$Distance\ to\ RM_{id}$: This is a linear variable that will look at how the distance of district *d* to the nearest region metropolitana affects household income per capita. The belief behind this is that the closer proximity that a district is to a metropolitana would be indicative of the amount of jobs in the region and the trade that is conducted. By these measures being higher we will likely see a higher household income per capita. In order to control for these effects the variable was included.

$f(Population\ Density)_{id}$: This variable accounts for population density of a district *d*. A polynomial approach will be taken to address the complex relationship between population density and household income. I do not believe that population density affects household income in a linear fashion hence why various forms will be explored. While the relationship is complex, I deemed it extremely important to include a control for the density of the region to ensure that measures of population are not omitted.

$f(distance\ to\ boundary)_{id}$: Lastly, I included a polynomial regression discontinuity to address distance of a district d to the boundary. Dell in her equation took a boundary fixed effects approach exploring the impact using four differences as a parameter, but I believe that the polynomial approach that I take will still allow for an accurate relationship. I believe that the mine's distance to the boundary could have varying impacts. Geographical factors have altering effects depending on the distances and as a result the regression should account for this.

Addressing OVB: I believe that I included the right amount of variables to prevent endogeneity but also not too much to achieve overfitting or multicollinearity. A qualitative approach was taken and past studies were leveraged to think about the potential variables that should have been included. There is always potential for OVB but that is addressed later in the paper. Data is needed to ensure that there is no OVB but at this stage I do not believe that any additional variables should be added.

Data sources:

The ideal data points that are critical for this research project are household income per capita, measures of population, and distance from the nearest region metropolitana for both the regions of Oruro and La Paz. In order to correctly acquire this data various steps would have to be taken. Firstly, historical maps of the mines in both La Paz and Oruro would be needed. Those surrounding areas near the mines would then have to be surveyed. What is important is marking the location of each of the data points so that distance from the boundary can be measured and accounted for. Mine ownership is not a data point that is required since the historical accounts are adequate enough to classify the regions. Additionally, the respective regions were selected because of their mine ownership. Distance to the nearest region Metropolitana is very freely accessible and can be acquired easily. What is important to keep into account is where the distance is being measured from. Population density can be helpful for this instance. I argue that distance from RM can be measured from the highest population density of Oruro and La Paz to the highest population density of the RM that they are closest to. This will allow for a standard measure of the distances, otherwise it would have to be by arbitrary city centers instituted by the governments. Population density of the regions of interest will require a similar approach to the household income per capita. While there are measures of population density in these cities, they do not take into account the historical mine locations. Without the historical mine locations in mind the data should not be used. Over the years the city limits have changed and the boundaries that the census data measures have been altered. The focus of this study is on areas near historical mines, therefore with the current data areas with mines risk a high potential to be diluted with data from areas that did not have mines nearby.

I believe the best approach to acquire all the specific data points would be conducting a household survey to answer all the outstanding questions rather than trying to parse through census data

and pin point the locations. This approach would take additional resources but would be more time efficient. By conducting a survey for the sole purpose of this research project, additional steps can be taken to ensure the legitimacy of the data and thus the legitimacy of the conclusion. While census data is accurate most times, a private research study will at minimum be as accurate or even more. The population data is not needed to be standardized because the points of interest are household income per capita (which standardizes the data) as well as population density and growth which will be on a common scale. The largest question regarding the survey would be the distance around the mines that should be included. Historical accounts of settlements around the mines are robust enough to account for the regions that individuals resided in while they were working in the mine.

The boundary discontinuity, as previously mentioned, will be the Cordillera Real mountain range. The location of the boundary will be a midpoint between the mine in Oruro and La Paz that are closest to the mountain range. This does not bias an individual region and instead creates a more accurate boundary in comparison to utilizing the middle of the actual mountain range. Modification of the variables will be very minimal since they will be surveyed in the way that they are desired.

While it is true most research projects would indeed benefit from a survey conducted to gather the exact data points they need, in this instance it is not a mere luxury but instead a necessity. The overall research project is predicated upon the impacts of colonial extractive mining on the region surrounding the locations of the mine. With that in mind, the data must be confidently from the regions that the mines existed in. With the changes in boundaries over time, the census data does not indicate the regions from the Mita regions anymore. The current census data is not granular enough to use Stata to remove the regions that are not desired. Analysis of the current data would be extremely biased. For the purpose of this project I will defer to using data collected from Melissa Dell's paper and theorize how if those trends were consistent in my region how they would then be manifested in my equation.

Analysis

Data Limitations:

The public data was too limited to actually be able to run the regression. I was able to uncover data on household per capita income, population growth, population density, distance to the boundary, and distance to the nearest RM. The problems arise when trying to match up the data with the respective geographical boundaries that caused the certain colonial mines being placed in one region compared to another. For instance, the region for Oruro has thus grown over time, so the data on the boundaries of this region are much larger compared to what is needed to be looked at. This will underestimate the impact of

the mining system since the government decided to draw new boundaries. The newer boundaries skewed all the data in one way and as a result, the data that I would need, is not what is publicly available. What would need to be done is specific household surveys of the region near the Oruro mine. The La Paz region had a similar effect but the data would overestimate the growth of the region. This is due to the government naming this region their administrative capital and increasing the amount of economic activity in the region. The household surveys would not be affected by this because it would focus on the regions near the mountain range and not the regions by the administrative capital. Using the current data on La Paz would not display what is intended from this study. By running the regression with the data I have now, I hypothesize that there would be a very large impact of colonial mining of the region. These findings would not be applicable to the broader question of the impacts of extractive institutions on long run outcomes. The growth was not due to the region flourishing from the mine, but simply boundary classifications changing due to government mandates. In order to still conduct an analysis, I will utilize the findings from Dell's regression and leverage quantitative reasoning to build upon my hypothesis.

Analysis Using Melissa Dell's Findings From Mita Mining In Peru:

TABLE II
LIVING STANDARDS[a]

	Dependent Variable			
	Log Equiv. Household Consumption (2001)			
Sample Within:	<100 km of Bound. (1)	<75 km of Bound. (2)	<50 km of Bound. (3)	<100 km of Bound. (4)
	Panel A. Cubic Polynomial in Latitude and Longitude			
Mita	−0.284	−0.216	−0.331	0.070
	(0.198)	(0.207)	(0.219)	(0.043)
R^2	0.060	0.060	0.069	0.051
	Panel B. Cubic Polynomial in Distance to Potosí			
Mita	−0.337***	−0.307***	−0.329***	0.080***
	(0.087)	(0.101)	(0.096)	(0.021)
R^2	0.046	0.036	0.047	0.049
	Panel C. Cubic Polynomial in Distance to *Mita* Boundary			
Mita	−0.277***	−0.230**	−0.224**	0.073***
	(0.078)	(0.089)	(0.092)	(0.023)
R^2	0.044	0.042	0.040	0.040
Geo. controls	yes	yes	yes	yes
Boundary F.E.s	yes	yes	yes	yes
Clusters	71	60	52	289
Observations	1478	1161	1013	158,848

For proper context the table above from Melissa Dell's paper, *The Persistent Effects of Peru's Mining Mita,* is provided. The table above indicates the impact of Peru's mining Mita on the log of household consumption. The data is separated by columns on the miles within the Mita boundary; It varies within <100 km, <75km, and <50km of the boundary. Additionally it is separated by panel A, B,

and C. Panel A includes a cubic polynomial specification in longitude and latitude. Panel B includes a cubic polynomial specification in difference to Potosi. Panel C includes a cubic polynomial specification in distance to the Mita boundary. The results found in panel A are not significant while the results for panel B and C are significant at the 1% (***= 1% significance) and 5% level (**=5% significance). Overall what this table indicates is that the proximity to the regions that had the mita system have a lower household consumption by 25% in 2001.

Implying these results on my study, I argue that there would be a correlation of household income per capita and log of household consumption. The reason for my belief that these variables would be correlated is that income enables consumption. With a higher income, consumption will be enabled at a higher level. I do believe that this relationship does plateau out at a certain level since people cannot consume endlessly but I argue that is not important in this instance. Both Peru and Bolivia are at the lower level of consumption and income so I do not believe they are at the point of the plateau and therefore can be correlated. With that established I therefore believe that the impacts of the Mita mining system on household income level would display a negative correlation at a 1% and 5% significance level. I do not believe that the impact of the Mita mining system would be as drastic as 25% though. I believe and can confidently claim that it would be between the range of a 5 - 20% level.

In addition to Dell's paper looking at household consumption rates, she also looked at the effects of the Mita on education over time. I believe that the results of the Mita system on education are directly related to the household income per capita. That belief is based on the economic presumption that high skilled labor requires a higher level of education and consequently will pay the individual more. Inversely, low skilled work will require less education and as a result will pay less. Therefore, if the Mita hindered education within a region, the overall income that a person makes in that region would be hindered as well.

TABLE VII

EDUCATION[a]

	Dependent Variable		
	Literacy 1876 (1)	Mean Years of Schooling 1940 (2)	Mean Years of Schooling 2001 (3)
	Panel A. Cubic Polynomial in Latitude and Longitude		
Mita	−0.015	−0.265	−1.479*
	(0.012)	(0.177)	(0.872)
R^2	0.401	0.280	0.020
	Panel B. Cubic Polynomial in Distance to Potosí		
Mita	−0.020***	−0.181**	−0.341
	(0.007)	(0.078)	(0.451)
R^2	0.345	0.187	0.007
	Panel C. Cubic Polynomial in Distance to *Mita* Boundary		
Mita	−0.022***	−0.209***	−0.111
	(0.006)	(0.076)	(0.429)
R^2	0.301	0.234	0.004
Geo. controls	yes	yes	yes
Boundary F.E.s	yes	yes	yes
Mean dep. var.	0.036	0.470	4.457
Clusters	95	118	52
Observations	95	118	4038

[a]The unit of observation is the district in columns 1 and 2 and the individual in column 3. Robust standard errors, adjusted for clustering by district, are in parentheses. The dependent variable is mean literacy in 1876 in column 1 (Dirección de Estadística del Perú (1878)), mean years of schooling in 1940 in column 2 (Dirección de Estadística del Perú (1944)), and individual years of schooling in 2001 in column 3 (ENAHO (2001)). Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosí, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the *mita* boundary. All regressions include geographic controls and boundary segment fixed effects. The samples include districts whose capitals are less than 50 km from the *mita* boundary. Columns 1 and 2 are weighted by the square root of the district's population. 64% of the observations are in *mita* districts in column 1, 63% in column 2, and 67% in column 3. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Dell takes a similar approach to table II above using panels A, B, and C to display subtle differences in the specification of the equations. To prevent redundancy, I will not delve into the panel specifications but they are exact to the ones explained under table II. Dell uses in column 1 literacy rate as a measure of education. The data on education is from a 1876 population census (exact source is listed in Dell's paper under Dirección de Estadística del Perú (1878)). Panels B and C show at a 1% significance level a 2 percentage point impact of the Mita mining system on literacy rates. Column 2 looks at the Mita's effect on the mean years of schooling in 1940. The data on this is from a population census and the exact source is listed in Dell's paper (Dirección de Estadística del Perú 1944). The results in panel B show there is a 5% significance level and in panel C there is a 1% significance level. In panel B there is a 18 percentage point difference while in panel C there is a 20 percentage point difference. This manifests as a long run negative effect of 0.2 years compared to the average mean schooling attainment of 0.47

according to Dell (Numbers taken directly from the Dell Paper). Lastly, column 3 measures the impact of the Mita on the mean years of schooling in 2001. The impact is negative in all of the columns but is only statistically significant at a 10% level in panel A.

Holistically, table VII only further solidifies what table II indicated. What we see is lasting effects over time on education in areas that had the mita system. Despite the varying significance level, I believe this still indicates for my equation there will be lasting effects observed from the Mita system. I believe if we see lasting long run effects of the Mita system on education we will surely see it in per capita income. I believe this since there are many large-scale efforts made by countries to promote educational equity over time. If this still is not rectified, then metrics that are more difficult to address such as household income per capita will be persistent.

A measure of infrastructure that I contemplated making my independent variable, but decided to not was road density. The reason for my initial belief to make this my independent variable was I believed that it could be used as a proxy to determine the maturity of the other infrastructure of the region. I decided against using this because I determined a better focus would be on the outcome of household level economics. In addition to a higher level of my focus wanting to be on household economics I determined that road density would disproportionately bias the La Paz region. The La Paz region is the administrative capital of the country. With the government naming this region the administrative capital of the country there subsequently is a large amount of trade flowing through this region. The trade benefits the government on a district level but does not directly affect the household income per capita. If I used road density as my independent variable, there would be a likelihood to overestimate the impact of the Mita of Oruro. While I did not choose this measure for an extenuating circumstance, I do believe that it is a great indicator of the impact of extractive institutions on a region. The control group used in Dell's paper did not have anything that could bias the road density data and therefore she included it. I believe it is still beneficial to look at for my study because it tells the story of the larger impact of colonial institutions on long run development.

TABLE VIII

ROADS[a]

	Dependent Variable		
	Density of Local Road Networks (1)	Density of Regional Road Networks (2)	Density of Paved/Gravel Regional Roads (3)
	Panel A. Cubic Polynomial in Latitude and Longitude		
Mita	0.464	−29.276*	−22.426*
	(18.575)	(16.038)	(12.178)
R^2	0.232	0.293	0.271
	Panel B. Cubic Polynomial in Distance to Potosí		
Mita	−1.522	−32.644***	−30.698***
	(12.101)	(8.988)	(8.155)
R^2	0.217	0.271	0.256
	Panel C. Cubic Polynomial in Distance to *Mita* Boundary		
Mita	0.535	−35.831***	−32.458***
	(12.227)	(9.386)	(8.638)
R^2	0.213	0.226	0.208
Geo. controls	yes	yes	yes
Boundary F.E.s	yes	yes	yes
Mean dep. var.	85.34	33.55	22.51
Observations	185	185	185

[a]The unit of observation is the district. Robust standard errors are in parentheses. The road densities are defined as total length in meters of the respective road type in each district divided by the district's surface area, in kilometers squared. They are calculated using a GIS map of Peru's road networks (Ministro de Transporte (2006)). Panel A includes a cubic polynomial in the latitude and longitude of the observation's district capital, panel B includes a cubic polynomial in Euclidean distance from the observation's district capital to Potosí, and panel C includes a cubic polynomial in Euclidean distance to the nearest point on the *mita* boundary. All regressions include geographic controls and boundary segment fixed effects. The samples include districts whose capitals are less than 50 km from the *mita* boundary. 66% of the observations are in *mita* districts. Coefficients that are significantly different from zero are denoted by the following system: *10%, **5%, and ***1%.

Table VII above uses the same panel approach as the previous tables. It is also separated into columns looking at (1) the density of local road networks, (2) the density of regional road networks, and (3) the density of paved/gravel roads. Column 1 indicates that the Mita system does not have an impact on local road networks. Column 2 indicates that the mita system at a statistically significant level negatively impacts road density on a regional level. In panel B the effect is -32.64 meters of roadway per km at a 1% significance level while in panel C the effect is -35.83 meters of roadway per km at a 1% level. Column 3 looks at the density of paved/gravel roads; This looks specifically at the density of high quality regional roads. There is a significant effect on all the panels and a significance level of 1% on panel B and C. Panel B shows that there is an effect of -30.69 per square km while panel C shows that there is a -32.45 per square km.

Applying these findings to my paper, I believe that if I had the data accessible I would get differing effects on column 1 than Dell. La Paz being a trade hub for the government will result in a higher density of roads throughout the region. This I believe would be at a 5% or 1% significance level and be very similar to the output of column 3. I also believe that due to the reasons mentioned above, columns 2 and 3 would both be tremendously skewed. La Paz has a higher amount of quality roads and regional roads due to government investment in the region. This government investment is not indicative of the prosperity of the region. The disparity that I foresee occurring from my findings and Dell's findings shows the importance of context when conducting an experiment. I would be able to leverage the data to portray a very compelling story of the impact of mita on infrastructure, it would not be accurate nor responsible. There are factors that would bias my findings in a way that would falsely exhausterbate the impacts of the mita system. I do believe though if a different region than La Paz was selected as my control group I would see similar effects as Dell. If a different region were to be selected, there would be the inability to conduct the boundary discontinuity regression.

The findings from Dell's paper indicate that my equation would likely produce similar results. Taking a step away from Dell's paper I believe that it is important to discuss what coefficients I estimate to see on my equation. Despite Dell looking at several factors that the Mita mining system could impact, I decided a better focus for the purpose of this project is on a single measure; That measure being household income per capita. I believe that when looking at the variables impact on household income per capita areas that had the Mita mining system will have a negative coefficient. This would indicate that the Mita mining system has a negative impact on household income level, which is my hypothesis. I believe that the variable, distance to the nearest RM, will have a negative coefficient as well. Areas that are closer to other cities will have easier access to trade and jobs. This negative correlation needs to be controlled so that the negative economic impact it produces will not be wrongly attributed to the Mita mining system. The population density variable I believe will result in a positive coefficient. The more dense a region is the more economic activity. This economic activity I believe will result in a higher household income per capita. I do believe that we could also see a negative impact of population density though. More populated regions can indicate lower income housing. I foresee the same issues with $f(Population\ Density)_{ib}$ hence why both of the variables will be evaluated as polynomials as well.

A large problem that having proper data would rectify is model specification. Model specification is extremely important to determine whether the variables should be linear or quadratic within the equation. I believe that $\beta 1 Mita\ Mine\ Indicator_{id}$ will be linear since it is categorical and does not have any effects that would indicate any quadratic relationship. $\beta 2(Distance\ to\ RM)_{id}$ is likely linear and I do not foresee it being quadratic. I believe that $f(Population\ Density)_{id}$ and $f(distance\ to\ boundary)_{id}$

has the greatest propensity to display quadratic indicators. $f(Population\ Density)_{id}$ has the ability for the agglomeration of effects to diminish at higher densities and the relationship variable should be indicative of that. The rationale for $f(distance\ to\ boundary)_{id}$ variable being quadratic is based upon the same explanation. There can be differing effects by distance that cannot be displayed through a linear relationship. The current model that the project includes is linear but upon access to the proper data I believe that could change. Traditional data visualization could be used to see if there is a linear relationship. I would use a scatter plot on Stata and implement a line of best fit. If there were signs of a quadratic relationship I would then fit a linear model and add quadratic terms. Upon completion of that I would conduct statistical tests to test the significance of the quadratic terms implemented; The tests would be compared to the linear model. I would use a F test for the statistical comparison in addition to examination of the R^2 value. A significant F value result would represent the quadratic model fits better. If the quadratic model fits better the linear term and the quadratic term would be included. The quadratic term would determine the curvature and the turning point of the model. Below is what the equation would look like if $f(distance\ to\ boundary)_{id}$ and $f(Population\ Density)_{id}$ were determined to be quadratic:

$$Y_{id}=\beta_0 + \beta_1(Mita\ mine\ Indictor)_{id} + \beta 2(Distance\ to\ RM)_{id} + f(Population\ Density)_{id} + f'(Population\ Density)^2_{id}$$
$$f(distance\ to\ boundary)_{id} + f'(distance\ to\ boundary)^2_{id} + \varepsilon_{id}$$

Despite not having the proper data to definitively state what the model will be, I believed that it was important within the analysis section to outline the potential method that I would have gone through if faced with this problem. Regardless of the model being linear or having some quadratic terms both are outlined throughout this research study.

Other than being unable to properly specify my model due to limited data, I also was unable to check if there were omitted variables. I attempted to cover any theoretical gaps of endogeneity from leveraging existing frameworks but as in every equation there is a chance of endogeneity. To check for this or address this problem, if the data were available, I would have plotted residuals against the predicted values of the equation. The residuals should not be correlated with the independent variable, but if they are then that is indicative of omitted variables influencing the equation. This could be done on stata and is called conducting a Ramsey RESET test. After this is conducted, if it indicates that I have an omitted variable I believe it would be best to rethink the equation and qualitatively deduce what I could be missing. Once that is done, data should be collected on the variable, the data sets should be merged, and the test could be re-run.

The issue of omitted variable bias and model specification were the largest problems that I was unable to definitely work out due to the lack of data. While the lack of data hindered my ability to run my

regression and uncover the truth behind my hypothesis I was able to accurately theorize what I believe will happen by building on the work of Melissa Dell. What is unable to be done though is be sure of the model specification or check if there is omitted variable bias. To be sure I adequately addressed these questions I wanted to take a theoretical approach to describe the steps I would take to check if those factors are at play and the steps that would need to be taken to rectify them.

To complete the analysis I will work under the assumption that my hypothesis was proven to be correct. That being said, I would like to broaden the implications of the confirmation of my hypothesis on politics of Bolivia. While, it is evident that the people of Oruro, by no fault of their own, have been hampered by historical extractive colonial institutions. Understanding that there is an issue is a step in the right direction but it does not rectify the issue. La Paz is convergent upon a positive path but it is important to bring Oruro to the same point. To achieve this policies should be taken to increase the infrastructural density of the region and the ability for education. The increased infrastructural density and education will result in higher paying jobs and hence higher household income per capita. Additionally, steps will need to be taken to ensure that Oruro plays a similar role to La Paz in the domestic and global economies. This can be by way of subsidizing infant industries and bringing them up to the same proficiency as the ones in La Paz. It is important to note that this is not simply a phenomenon seen in Oruro but one that is felt across all the regions subjected to the mita mining system. If steps are not taken, it is clear that it will not rectify itself over time. By policies being implemented to benefit regions harmed by mita mining it does not only benefit the respective regions but the country as a whole.

The world can use this as a case study as well to question their own regions and their economic paths. Whether it is other South American countries harmed by the Spanish silver mining such as Guyana or it is African countries hindered by other European powers, there is a need for introspection. The introspection will benefit the people, the country as a whole, and the global economies. There are some countries that have had a large amount of their economies hindered by the colonial extractive institutions imposed on them and there is potential that they cannot allocate resources to bringing their regions up to speed. If this is the case this is when global governance, such as the United Nations, should hold the colonizers accountable and charge them with bringing the regions they harmed up to speed. While, this study and analysis as a whole looks at one region, it is not applicable only to one region.

Conclusion:

I would have enjoyed the opportunity to run the regression that I outlined throughout this paper but due to data limitations I was unable to accurately conduct the analysis that would present results that could have been meaningful. Instead, if the analysis were to be conducted it would have been based upon

flawed data. The limitations of the data were not due to the inability to merge datasets nor access the information on the web. The limitations of the data were due to the data being predicated upon boundary lines that were not historically similar to the ones of the regions of study. In spite of the lack of new quantitative evidence that I was unable to display, I was still able to present a thought out study. The study was based on a question that has meaningful real world implications. While the individual question looks at the effect of extractive institutions on long run development in Bolivia, it can be expanded out to a global scale.

In many of the current countries, colonization played a role in their history. Some countries were the victims and others were the victor. By understanding the impact of extractive institutions on long run development measures can be taken to rectify the indiscretions of the past. A very important aspect of this research study is the paper reviews that both my analysis and hypothesis are rooted in. Dell, Acemonglu, Johnson, and Robinson all echo the same theme just in different examples. Acemonglu, Johnson, and Robinson look at a broader view of extractive institutions. They provide examples from different periods of time and still show the persistent effects. We see from their findings that when extractive institutions are in place there is staggered growth and even after they are repealed the growth is still hindered. Dell looks at a region very similar to mine, which I was able to leverage to hypothesize the effects that I believe I will see. I am fairly confident that if this study were to be conducted I would see similar results to both Dell and Acemonglu, Johnson, and Robinson. Conducting the analysis of the problem is only the first step. After that, there must be additional steps taken to increase the global equity that is deteriorated by extractive institutions.

It is not possible to prevent the formation of extractive institutions globally nor is it possible to retroactively correct the historical ones that were implemented but there can be macro and micro approaches to lessen their impact. The macro approaches that can be taken are primarily by the regions that implemented the wrong doing. Countries such as Spain, Portugal, and England should take a more vested interest in the regions that they hindered. This should be by way of monetary pledges and monitoring of the issue. By doing this, the problem will be lessened. A micro approach is at the country level. Countries need to be aware of regions that were directly impacted by the extractive institutions of the past. There needs to be an intentional effort of inclusion into the domestic and global economy. By inclusion in these economies the infrastructure of the regions will grow over time and the outcomes of the residents will benefit.

In conclusion, while this project might have not resulted in nuanced empirical evidence, I believe the thoughts laid forth adequately address the question regarding the circumstances. A higher emphasis of this project was placed on qualitatively addressing the problem. The theoretical concept of extractive institutions was explained and steps that should be taken to address them were outlined. Steps can be, and

should be, taken to confirm the hypothesis I laid out but after that is done the primary focus should be on identifying regions that extractive institutions have impacted. Economic analysis can only take this problem so far, now policies and governance is needed.

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