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ECONOMIC GROWTH AND ITS IMPACT UPON POLITICAL INSTABILITY:  
AN INDEPTH EXAMINATION OF THE ARAB SPRING

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## Abstract

The events of the Arab Spring caught many off guard for the tumultuous revolutions that occurred in a previously stable environment. This work will address what factors could incite a nation to undergo a revolution or some other form of civic unrest. This area is very relevant as poor economic performance can dissuade investors from a region, further harming its growth and leading towards governmental unrest. The main factors examined within the work will be the influence of known theories such as the resource curse, coup contagion and the affect of political unrest. Other key factors, such as the literacy and unemployment rates, will also be examined within the context of a regression model. The focus of this research will be limited to the nations of Tunisia, Egypt and Syria as they have all been affected by the tumultuous events in varying degrees. The research shows that economic growth has some impact on political instability, though the exact levels are inconclusive.

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## **Introduction**

There are many reasons that a nation could undergo a revolution. They could be over cultural differences, divided over years of constant strife, or ideological or historical differences. A regime could be so cruelly oppressive the citizens have no choice but to revolt. However, economic factors cannot be ignored as a means of inducing a revolution within a country. This paper intends to examine the affect that these conditions, particularly GDP growth as well as education levels, could have on determining the true relationship between economic growth and political instability.

The Arab Spring came as a shock to the rest of the world and seemingly exploded over the course of a year. Nations previously considered governed by incredibly stable regimes were now being called into questions for their actions. Due to the explosive nature of the events, this paper will focus on this region to try to analyze if economic forces were a factor in provoking change.

Three nations centered within the events of the Arab Spring will be examined throughout this work: Tunisia, Egypt and Syria. Tunisia is considered to be the spark that ignited the rest of the region so it certainly merits discussion. Egypt was considered to be one of the United States' strongest allies within the region and was considered an untouchable regime, few thought it could fall victim to the apparent domino affect. Syria is the last nation observed because, unlike the others, it has a strong history of political violence and the outcome of the fighting is still unclear.

While there are many explanations as to what could have potentially caused the Arab Spring, this paper examines a few of the factors to determine their potential impact. First, the individual economies are examined to gain a more thorough understanding of

their intricacies. Secondly, the potential impacts of the resource curse and the coup contagion theory are discussed as they are key factors not included within the regression model. Finally, the affect of political instability versus economic growth is directly measured by a model and projected onto the Arab Spring. This model will be able to isolate the impact that certain factors from social, such as the literacy rate, to economic, GDP growth, has upon a nation. This will ultimately determine which may have a strong impact upon inciting a nation, particularly Tunisia, Egypt and Syria, to overthrow their government.

### Introduction to the Arab Spring

In a small town in Tunisia, a man named Mohamed Bouazizi was working as a fruit vendor to earn the bare minimum to feed his family. Strapped by economic pressures, his anger at his country erupted when the government confiscated his fruit cart. Instead of accepting this, he instead chose to make a public statement. He set himself on fire in protest and in doing so, ignited a protest that swept across the entire nation and eventually the region of the Middle East.

The public act immediately resonated with his fellow Tunisians, who began protesting that day in the local town of Sidi Bouzid against their government. The internet aided the cause by distributing the information at a rapid speed. Within days, protests appeared across the nation. After roughly a month, President Zine El Abidine Ben Ali fled the country, his regime toppled (NPR).

Nearby President Hosni Mubarak's rule, of many decades, was suddenly being called into question. Within Egypt, the foundations for a youth uprising were being laid long before anyone realized what was occurring. According to the Frontline video,

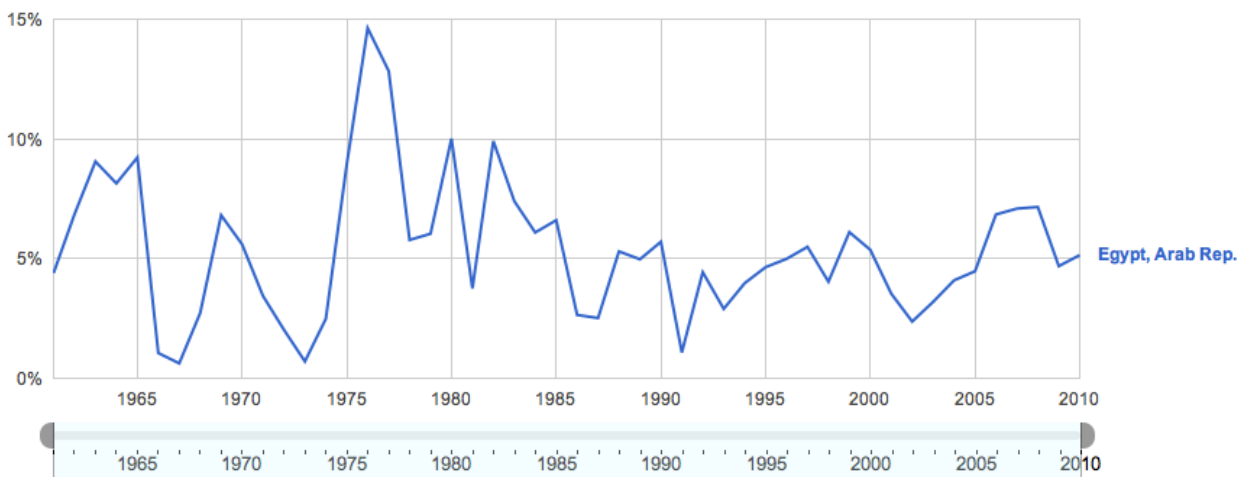
“Revolution in Cairo,” sixty percent of Egypt’s population is under the age of thirty and the vast majority of them are unemployed. A 2004 study conducted by the Ahram Center for Political and Strategic Studies discovered that sixty-seven percent of the youth were not registered to vote. Over eighty-four percent had never participated in any form of public demonstration (Shapiro, 2009). This is a staggering demographic to rally. Ultimately, they won out and President Mubarak stepped down after an eighteen day revolt by the citizens (Kirkpatrick, 2011).

Traveling geographically, the protests came a bit later to the nation of Syria living under the authoritarian rule of President Bashar al-Assad. The focal point of their uprising has been located within their southern city of Deraa, the initial spot of the protests. Syria first promised reform to its citizens, only to begin a harsh crackdown. While the populations of Egypt and Tunisia eventually had their goal realized, the Syrian people continue to fight for their rights. With many powerful international leaders, including the United States, calling for a regime change, the future of the regime seems shaky at best (National Journal Staff, 2011).

The Arab Spring came as a shock to most experts; these events seemingly came out of thin air. Many of these leaders have retained power in an authoritarian fashion for decades without serious movements towards regime upheaval. This suggests that such political change was much needed and events were being put into motion long before Mr. Bouazizi walked to the government building on December 17.

### Examination of the Egyptian Economy

According to the CIA World Factbook, the nation ranks 30th in physical size as well as boasting a population of 82 million, making it 15th comparatively among the world. With a population growth rate of 1.96% and a shortage of arable land to live upon, the nation continuously threatens to overtax its resources. The current Gross Domestic Product (GDP) of the nation of Egypt is \$218.91 billion dollars (Gross Domestic Product).



The figure above highlights the varying levels of the Egyptian annual growth rate. The nation was steadily growing throughout recent years, noticeably with a large peak around the years of 2008 and 2009. However, with the recent turn of events from the political crisis, there is a drastic drop in growth highlighting a level of dependence between the two factors.

The Egyptian economy is one of massive trade deficits. A nation that is almost completely dependent upon its imports may not be able to provide something as basic as food to its citizens. This creates a volatile situation with citizens ready to strike. Other major components of their imports include equipment, particularly from the United

States. The nation does have exports; namely oil, metal, cotton, chemicals and natural gas. (El Madany, 2011).

While they are an exporter of oil, exporting roughly 155,200 barrels per day, they are not a match for some of the other nations in the region. Saudi Arabia, one of the leading oil producers in the world, produces 8.65 million barrels per day (Top World Oil). This fact reduces Egypt's impact upon setting the price or having any clout among the organization, OPEC. Indeed their production is so small they currently are not a part of the international group.

Beyond common exports, tourism is a crucial part of the Egyptian economy. This factor decreased sharply directly after the attacks on September 11<sup>th</sup> 2001. This stagnation of tourism only continued after the recent events of the Arab Spring and the resulting revolution. Foreign Direct Investment (FDI), including direct foreign aid, is also a large part of the Egyptian economy. Egypt is the second largest recipient of US aid after Israel, largely due to the political alliance created by the US when Egypt agreed to recognize Israel's existence. Since 1979, the United States has provided Egypt with \$1.35 billion in foreign aid (Wingfield).

While Egypt's economy has always been diverse; within each stage of their development, a strong focus on one commodity can be isolated. Prior to World War II, cotton made up ninety-percent of Egypt's entire exports. However, post-World War II, cotton textiles began to edge into their share of the market. By 1985, oil had overtaken cotton as the major export for the nation (Egypt Trade, Exports and Imports 2011).

This increasing dependence on a commodity like oil, leads to a life of hardship for the Egyptian people. Typical to the resource curse prediction, the World Bank states that



nearly 44% of all Egyptians either live in extremely poor conditions, where they are unable to meet minimum food needs, near poor conditions, where they are able to meet some basic food needs or poor conditions, where they just barely meet their food needs (Beinin, 2011). This income inequality is another strong suggestion that the country is a victim of the resource curse.

A country with such a strong reliance on oil can hamper its own economic growth by refusing to expand into new markets and diversify their economy. While this strategy may be successful for a nation like Saudi Arabia, Egypt does not have enough oil to become a major factor within OPEC (indeed, their production is so small that they are not a member of the international organization). This feeble dependency can create a situation with income inequality and extreme poverty, potentially leading people to a revolution.

#### Examination of Tunisian Economy

Located in North Africa and only becoming a free nation in 1956 after their colonists, the French, were forced to acknowledge their independence, Tunisia is another country to examine. Currently, the nation has the 70<sup>th</sup> strongest economy in the world with a GDP of \$48.9 billion (CIA Factbook). While the nation is young, dictators who have stagnated the democratic process as well as potential economic growth in their determination to maintain power have only ruled the country.

Their natural resources include petroleum, phosphates, iron ore, lead, zinc, salt, all of which can be exploited into positive or profitable earning exports for their economy (CIA). Initially, the nation focused on socialist policies to bolster their economy; however, this led to economic disaster and the government was forced to alter their

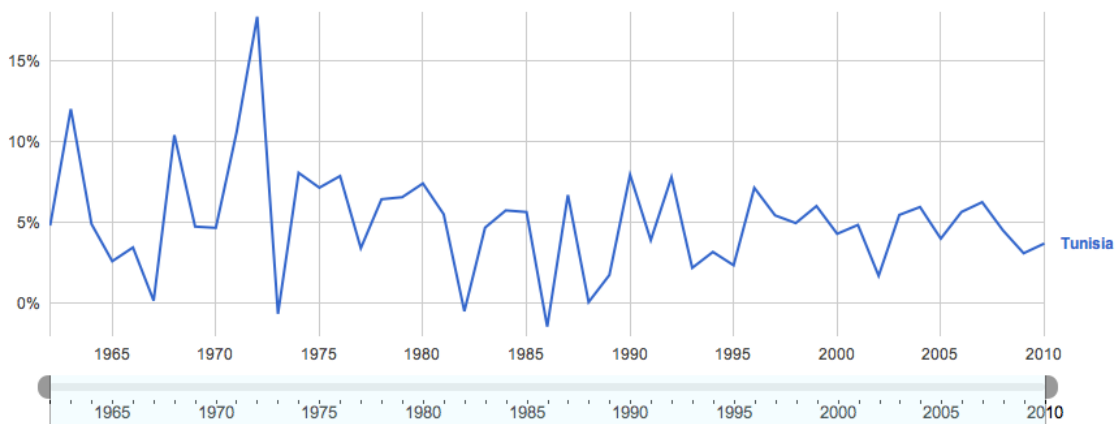
policies. They embraced a market-focused economy and concentrated on exports, foreign investment and tourism.

Currently, the backbone of their economy includes such commodities like “textiles and apparel, food products, petroleum products, chemicals, and phosphates (CIA).” Textiles are a large part of the economy; industrial production accounts for 31.1% of all GDP, comprised of petroleum, mining, textiles and food processing. Roughly 90% of the textiles produced within the country are exported for profit (State Department).

These new economic policies put into place during the 1980’s meshed with the policies of the International Monetary Fund as well as the World Bank. It prepared the country for a strong focus on the agricultural sector; today, a large portion of their population, roughly twenty percent, work in this industry (Tunisia.com). Additionally, a significant amount of revenue is generated from tourism. Together, along with a healthy partnership with the European Union, these policies have allowed the nation stable and steady growth with strong exports (State Department). However, the recent tumultuous events of the Arab Spring have caused sharp decreases in tourism and other forms of production.

In contrast to their oil-driven neighbor, Algeria, Tunisia has modest levels of oil production that are not enough to compete on a global level. “According to the 2011 BP Statistical Energy Survey, Tunisia produced an average of 79.5 thousand barrels of crude oil per day in 2010, accounting for 0.09% of world production. (Ayari, 2011).” The nation has existing oil reserves that culminate to be 426 million barrels. While the nation produced 75,000 barrels per day of crude oil in 2005, this is a sharp decrease from their

peak of production that was reached in the early 1980's. Between the years of 1982-1984, the country was able to produce 120,000 barrels per day of crude oil. However, due to increasing levels of demand from their population the country was forced to halt exporting crude oil and actually import refined petroleum to be able to keep up with their nation's demand (DEPLC). In November of 2011, the country discovered as many as 51 million barrels of oil for which they awarded permits to an international vendor to extract. This furthers the potential of international investment within the country. This recent discovery could allow oil to resume the large presence it used to have in the country.



The data above is pulled from World Bank records and highlights the GDP growth beginning in 1960 and continuing until 2010. The graph shows the volatile nature of their economic growth, in particular the strong fluctuations shortly before they embarked upon the economic reform ideals established by the World Bank and the International Monetary Fund. Additionally, there is a dramatic drop right before the Arab Spring revolution.

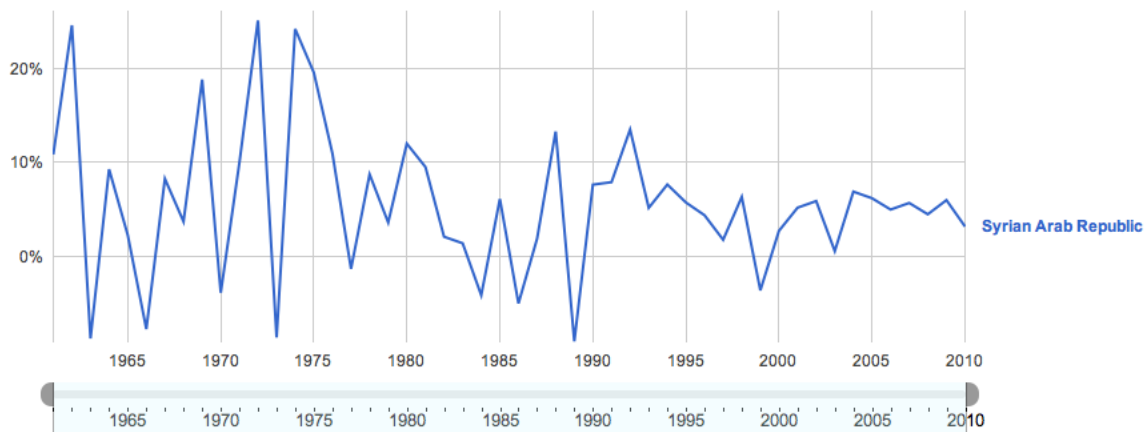
Unfortunately, the government was not able to solve the issue of income inequality and unemployment. Directly prior to the revolution, one in four university

graduates was unemployed (Achy 2011). This high number results from the dramatic increase of job-seekers with a post-secondary education; in 2000, the number of job-seekers with such levels was only at twenty percent yet climbed dramatically to an astounding seventy percent by 2010. This is instrumental in the realization that Bouzizi was not alone in his frustrations. Indeed, eighty-five percent of the unemployed were under the age of thirty-five (Achy, 2011).

### An Examination of the Syrian Economy

Similar to Tunisia, Syria received its independence from its colonizer, France. However, while Tunisia was ruled by a dictator and experienced little change within their nation for many years, Syria's early years of independence was fraught with military coups. In spite of the military turbulence, the nation has the largest economy with a GDP of \$64.7 billion in 2011 of the countries examined within this study (CIA). However, the influence of the government on the economy is undeniable and their stronghold minimizes the impact the private sector can have on the economy overall (Heritage). Additionally, there are fears that this continued repression will hinder any future growth in new industries.

Their economy has a large variety of exports totaling \$12.66 billion. Major commodities include, "crude oil, minerals, petroleum products, fruits and vegetables, cotton fiber, textiles, clothing, meat and live animals and wheat (CIA)." While crude oil and petroleum are a major factor within their production, the diversity of exports is encouraging, notably with tourism accounting for twelve percent of their economy (Starr). The strong diversification of exports steers away from the notion that Syria may be victim of the resource curse.



The GDP growth rate from 1960 to 2010 can be seen in the graph above with the data being pulled from the World Bank. There are sharp alterations from 1960 to 1975, which are consistent with the high frequency of coups they had during that period of time. Additionally, there is a downturn seen in the years leading up to the Arab Spring. These alterations would lead one to believe there is cause for believing there is a strong correlation between the two factors.

Though Syria had a relatively strong economy, their income inequality is still something to cause concern. One out of every three Syrians lives under the poverty level, a situation the government needs to address (Achy 2012). Their unemployment ranks at ten percent; however, the number for youth unemployment is a staggering thirty percent (Achy 2012). Raises in wages are matched, or superseded, by inflation in most instances and the increases only benefit the more technical jobs, harming the sixty-percent of the population with a low-skill job (Achy 2012).

Syria has the largest levels of oil production of the three countries examined. In 2010, it had the rank of being the 34<sup>th</sup> country in the world producing 401,000 barrels per

day. It is the 46<sup>th</sup> country in exports, exporting roughly 263,000 barrels per day (CIA). Their largest purchaser is the European Union, accounting for nearly half of all purchases (Starr 2011). However, their supplies of oil are quickly depleting, forcing them to become a net importer of the precious commodity. This begs the question about the status of their economy once they lose oil as a major source of revenue. Such a sudden decline could lead to political unrest.

Agriculture alone not only accounted for a quarter of the GDP but labor force as well. A strong dependency on agriculture is not the wisest choice. Over the past few years, successive droughts have wreaked havoc on the industry and caused the poverty rate in the southern section of the country to double in the past few years (Achy 2011).

#### Resource Curse: A common factor among the Arab Spring?

Our model, which will be addressed in a later section, does not include any variables specific to the type of economy within each country. Thus, the ability to assess factors like the resource curse is not addressed within the paper. Within the resource curse, there is one specific type of asset which can further spur conflict. These are known as “lootable” resources, which are high-value natural resources that have low economic barriers to entry. These resources are tantalizing to individuals and may provide further incentive to incite a rebellion (Dunning 2005).

It is a common belief that these commodities, especially oil and minerals, effectively cripple other facets of the economy. This curse suggests that nations who have an abundance of natural resources, primarily those that are non-renewable such as oil or natural gas have a harder time with economic growth or development. This could be due to the income inequality these resources cause; they typically center the economic wealth

within one class of people instead of allowing it to spread among the masses. This isolation leads to a “monoexport” of that primary resource. This dependence upon one resource will lead to a rising exchange rate during economic booms but could also hurt the cultivation of other resources by soliciting necessary other productive resources (Dunning 2005).

Political leaders facing a resource abundant economy all share a dilemma. Diversification of the economy is something they all would like to promote. It will reduce the fear of fiscal volatility and could serve to bolster economic profits of the nation. However, in doing so this also creates the issue of others within differing social classes having access to power. Many choose to forgo economic diversification and instead rely upon exploiting the resources they already own. However, this resource reliance could lend itself to creating more financial crises which could create a social divide within the population increasing the likelihood of a revolution.

While there is not a definite way to determine how strong this impact is upon the Arab nations, the examination of their economies above highlights their dependence upon such commodities. Since this factor was not addressed within the model, it is important to point out as a limitation.

#### Coup Contagion and Possible Implications

Although income inequality and resource levels clearly have an impact upon political instability, the theory of coup contagion should not be ignored. Other names found within literature are “bandwagon affect,” which suggests the spreading of a political behavior that spreads across a community similar to a disease. When discussing violence, it is more common to utilize the terms contagion or demonstration effect

(Govea, West 1981). The contagion theory suggested that the military coup or political unrest of one nation could proliferate, physically or mentally, to a neighbor ultimately impacting a region (Ades, Chua 1997). Physical examples of the violence could include a direct invasion, using other nations as harboring rebel groups or refugees, or protests and riots (Hill, Rothchild 1986). In a world where globalization is increasing the spread of ideas and culture is considered common, it is not illogical to assume that conflict and social unrest could follow a similar path.

These military coups share many behavioral characteristics (Li, Thompson, 1973). Indeed, four varieties of “influences” can be found to explain coup behavior: “model, disinhibitor, negative example, and reference group. (Li, Thompson 1973).” A coup leader’s behavior can be emulated by another leader within another nation, a fact demonstrated within the model influence. The evidence that a coup can occur with relatively low opportunity costs, namely a low death rate or expenses, loosens inhibitions within another country’s rebel group. Additionally, other civilian or international interference is incredibly rare, a factor which seen in past experiences, could incite rebel groups to carry out their operation. However, for this to occur there must be some collective identity within the observing nation. This serves as a reminder that the success of a group in another nation will not carry through to their neighboring country if there is no group ready to assemble (Hill, Rothchild 1986). Learning from another group’s mistakes or tragedies, future coup leaders can learn from the past to attempt to avoid or anticipate negative examples. Many use this as “preventive medicine” to avoid a situation seen in the 1965 Nigerian coup (Li, Thompson 1973). A regional group of officers could set their status aspirations higher than before by looking at their predecessors’ success.



Dr. Richard Li and Dr. Richard Thompson, who co-authored “The “Coup-Contagion” Hypothesis,” assigned two differing models to try to test the theory. First, they tested the Poisson model, typically used for testing the frequency distributions of wars, alliances and military coups (Li, Thompson 1973). Noted in their literature review, such as Putnam and Midlarsky in 1970, conducted limited studies which failed to show any correlation between military coups within nations, they decided to conduct a more intensive study. In doing so, they relied upon two stochastic models, the Poisson as well as the contagious Poisson. The regular Poisson adopts the idea that the military coups occur independently while the contagious believes the opposite. These models are advantageous because they allow for a “direct method of analysis” since one person changing their behavior directly affects the probability of whether the second person will (Govea, West 1981). Highlights of their results show that the largest evidence for proneness homogeneity is found within Latin America and the Arab world within specific time periods. Their results demonstrated that while this theory is applicable to those regions, it may not be valid for all global situations (Li, Thompson, 1973).

However, many state that the theory of coup contagion could be linked back to the factors of modeling and reinforcing the concept. The idea of a coup is not novel; people have been seeking to replace leaders they consider incapable, whether with the help of military or alone, since systems of governance have been established. It could also be argued that people simply respond to what they wish to see happen. After the first coup in history, people have become predisposed to the notion and could actually work to influence themselves. The mere idea of a coup could be enough for most people to take

their own steps to create one. The idea only strengthens when each resulting coup is successful.

Therefore, it is easy to see why certain regions have become susceptible to continuous military interventions. Once a nation has had a successful coup, rebel groups within the country will be looking towards the idea as a way to achieve power. This domestic anticipation is a powerful factor towards the theory of coup-contagion (Li, Thompson 1973). However, students of “ethic and national assertiveness” have argued that contagion could be just the reaction of fundamental notions of social learning as well as social acting (Hill, Rothchild 1986). Once this spreads across country borders, it could be argued that this may become a part of their culture as it becomes engrained in their citizens’ minds and history books. This could be true of Syria, a nation that had a string of military coups within the first decade of their independence.

Within the ever-expanding interdependence of the global environment, the role of media is playing an increasingly important role within this theory. The media can play a crucial role, whether to incite or disinhibit, in the political unrest solely by how much coverage and what angles they choose to give an issue. This is especially important within nation experiencing political unrest. If the media is controlled by the government or political elites, stories of dissatisfaction by the average citizen are far less likely to be covered (Hill, Rothchild 1986).

Yet the rise of social media may be able to overcome this obstacle. This is evidenced by the nation of Egypt with the current events of the Arab Spring. The government restricted access to the internet after outlets like Facebook and Twitter helped enlighten and enrage many citizens. However, companies devised a way to utilize

phone lines to connect to the internet, helping the average citizen have access to the internet and demonstrating technology's achievement over the mainstream government.

Another popular extension of the contagion theory is riot theory. This may serve to be increasingly useful in examining the implications of political unrest among a country because the events would not necessarily have to be as extreme as a military overthrow. Additionally, riots typically contain a sizeable portion of the average citizen, making it a better reflection of the entire population versus a selective group of people working together. They are rarely premeditated, often occurring spontaneously as a direct reaction to current events and could thus be more likely to be linked to the theory of contagion. Professors Dr. Rodger Govea and Dr. Gerald West conducted a study examining the theory of riot contagion among fourteen different countries within Latin America; they focused on the time-series of riots as a way to determine if riots within a country predispose them to rioting in the future. The countries examined are Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Panama, Uruguay and Venezuela (Govea, West 1981). They examined data on these countries from the years of 1949-1963. Similar to the research done by Li and Thompson, they relied upon Poisson and contagious Poisson as a guideline for their findings. In 1961 they noticed a general trend of rioting emerging which paralleled the political crisis within Ecuador. Ten riots occurred within the year all over different areas of the nation, including riots within three different cities all in the month of November. Venezuela experienced a similar situation; however, theirs had more serious implications. Their nine riots within the month of January in 1958 succeeded in the ultimate overthrow of Perez Jimenez. This lends credit to the concept

that if riots indeed are contagious, than combined with a larger revolt could lead to a restructuring of leadership.

The theory of riot contagion certainly holds merit within Tunisia, hours after Bouzizi had expressed his public outrage that town was rioting. Within days, angry protests had swept across the entire nation. News of the act had spread rapidly through the use of social media and many citizens felt emboldened by their neighboring town to begin a similar riot.

One could argue the theory of contagion extends beyond the history associated with it in the Arab world to the current actions of the Arab Spring. After the initial self-immolation within Tunisia that sparked political unrest across the entire nations, three other nations within the region experienced protests of self-immolation. This shocked the region, who previously had little instances of the act, and within a month had experienced seven incidents of copy-cat nature (Arab 2011).

The events in Tunisia sparked a feeling of hope within the youth of Egypt. Many believe that Egypt, and later Syria, were victim of the “influences” which explain why the contagion theory occurs. One of the four influences is disinhibitor, this idea stems from the fact that a group can see something occur and be emboldened to make this occur within their own nation. The citizens of Egypt saw their opportunity to take a stand.

After the fall of President Ben Ali of Tunisia, many Arab leaders began making concessions to their citizens in the form of economic benefit packages leading one to believe in the reality of a contagion theory. As far away as Kuwait, Emir Sheikh Sabah al-Ahmad al-Sabah paid each Kuwaiti citizen KD 1,000, the equivalent of \$3,558 in US dollars, as well as food rations for the next thirteen months (Arab 2011).

The theory of contagion is broad and wide ranging. Analyzing its effect on riots can demonstrate the average citizen's frustrations while a military coup is the preplanned work of a select few. The scope can be measured across a single nation as well as its impact on the entire region. However, without more extensive study into the concept, little can be decided about the ultimate affect it has upon political conflict.

#### Political Instability and Economic Growth: A regression model

The link between political instability and economic growth is crucial to examine when discussing this subject matter and is the primary focus of this paper. Political instability is defined as the inclination of a regime failure. Many studies have concluded that countries with high levels of political instability have decreased levels of economic growth. This political instability will negatively affect economic growth within a nation because it creates policy uncertainty. An uncertain political future means that people shy away from such undertakings like investments and savings. These uncertain policies will cause risk-averse investors to wait to see what policies are eventually implemented or completely withdraw their money from the country and placing it into another, more stable country.

In the early 1960s, Argentina was a nation with incredible wealth and was ranked above many nations we consider to be financially fortunate today. However, the country was wrought with political turmoil, having experienced multiple violent coups since. Such consistent unrest, a result of violent activities from guerilla groups, has contributed to the stagnation of Argentinian economic growth.

It has been suggested that the relationship between political instability and economic growth feed into a vicious cycle together. If the probability of a regime

collapse increases, one example being an internal political conflict, than this will affect the economic environment. Investors will want to pull their assets; this lack of investments will decrease the future potential of the economy leading to poor growth. This poor growth can result in a dissatisfied population that will retaliate by a rebellion. This rebellion and new regime will take a while to reestablish investors' confidence leading to continued negative economic growth and increasing the likelihood of another rebellion in the future.

The model I have chosen to adopt to determine the effect a political rebellion, particularly something as extreme as a military coup, could have on current and future economic growth was based off of one utilized by Professors Alesina, Ozler, Roubini and Swagel in their 1996 paper, "Political Instability and Economic Growth." I utilized the estimates of their model they reported, which included yearly observations of 113 countries ranging from the years of 1950 to 1982. Their dependent variables are government change and economic growth. They divide government change into three variables; however, I chose to only focus on two: GCHANGE and COUP (Alesina, et al. 1996). I will utilize this model to project it onto the Arab Spring to see which factor, economic growth or political instability, has a stronger impact upon the other.

From their analysis, they discovered the average occurrence of total governmental changes for the sample, which includes all of the nations, is .28, which correlates to a governmental change roughly every 3rd year (Jodice and Taylor 1983). Within their calculations, they discovered that the frequency of a military coup is .05 or roughly every 20 years. By isolating regions, they provided valuable data that detailed Latin America and Africa were the areas with the highest frequencies of coups. This data is crucial,

providing insight that shows the area analyzed later is susceptible to economically damaging military coups as well as providing important insight into the areas.

Until recently, the continent of Africa did not compare to Latin America in terms of political instability. Instead of democracy, many regimes favored authoritarian methods with long tenures as leaders. Forgoing elections, the lack of switch in power is not surprising. However, after Latin America they are the second region with the most political change overs. Out of these shifts in power, over half of them take place through military coups.

These two regions, Latin America and Africa are also the two regions with the lowest economic growth by comparison of the data presented in Table 2. This highlights a correlation between low economic growth and consistent political turmoil. This table discovered that the average per capita growth rate of a nation in times of political calm were 2.8 percent. However, these changes nearly halve themselves in a year with political turmoil resulting in change. This gap is only intensified when examining the nations that experienced a military coup. During this instance, economic growth has been proven to actually fall to a negative 1.3 percent. This data is not limited to specific regions of the world; economic growth is highest amongst the nations who have not experienced governmental change within the year and such change negatively impacts their development.

However, since economic growth and political stability seem to be linked it is difficult to determine which causes the other. Does poor economic performance lead people to revolt or does the threat of a revolution create poor financial performance? To

begin to define the issue within the context of the Arab Spring, I utilized the same formula as Alesina, Ozler, Roubini and Swagel.

$$c^* = \alpha_c X_c + \beta_c X + \gamma_c y + u_c$$

$$y = \alpha_y X_y + \beta_y X + \gamma_y c^* + u_y$$

where each variable means-

$c^*$ = a latent variable which highlights when  $c^* > 0$  we observe a governmental change and if opposite, we do not observe one

$y$ = yearly growth rate

$X$ = exogenous variables which affects both governmental change and growth

$X_c$ = exogenous variables which only affect governmental change

$X_y$ = exogenous variables which only affect economic growth and

$u_c$  and  $u_y$  = bivariate normal errors.

This equation allows for true isolation of the relationships. It provides for one exogenous variable within the growth equation which is not found in the equation for political change and vice versa. This is to highlight which has the highest levels of impact.

Within the governmental change formula, the explanatory variables can be categorized within three classes. The first being indicators of political unrest which could explain the nearness of a governmental class, such as riots or other recent attempts to eliminate the regime. Additionally, there are structural variables which account for differences across countries, such as their levels of democracy, region or interaction with their neighbors, which will also be discussed in detail later in this paper. Finally, factors



such as the economic growth rate and other key indicators of economic performance will be examined.

Within this governmental change equation exists the contemporary growth rate (GROWTH), past growth (GROWTH (-1)) and the past world growth rate (WGROWTH (-1)). The world growth rate is comprised of the growth rate of the G-7 nations and is used as a way to measure the economic activity of the specific nation or region against a world average. This also presents the viewpoint of how popular a nation is amongst their people, further highlighting the importance of economic growth within a political environment. Since Latin America and Africa are the two regions with the lowest growth rates as well as highest probability of a governmental change, two dummy variables (LATIN and AFRICA) are included. This will help capture the features unique to the region such as their regime history, democracy versus authoritarianism and crucial policies. Additionally, a variable, (GCHANGE (-1)) is used to flag the levels of political instability and its frequencies. Additionally, Alesina, Ozler, Roubini and Swagel use a variable which indicates the number of changes within the executive level of the regime, such as cabinet reshuffling, which does not result in a change of overall leadership; however, that variable has been omitted from this study. All of these variables are lagged to best analyze the impact from the previous year.

The growth equation involves similar variables. They include a current government change tendency to examine the relationship between growth and instability. A measure for human capital was included through the enrollment rate in primary education (EDUC). Similar to the governmental change equation, variables for the Latin America and African regions were included to protect against region-specific issues as

well as for cross section growth regressions. To further control for time-based changes in growth, two additional variations were included. These variables are the lagged growth rate which shows the frequency of the growth progress as well as the lagged world growth rate which highlights the effect of the world business cycle on an individual nation's economy, seen in both equations.

The two individual equations become

$$\text{Prob (GCHANGE)} = \varphi (\alpha_c \text{GROWTH} + \alpha_{c1} \text{EXADJ} + \alpha_{c2} \text{GCHANGE}_{-1} + \beta_{c0} + \beta_{c1} \text{GROWTH}_{-1} + \beta_{c2} \text{WGROWTH}_{-1} + \beta_{c3} \text{LATIN} + \beta_{c4} \text{AFRICA})$$

and

$$\text{GROWTH} = \alpha_y \text{GCHANGE} + \alpha_{y1} \text{EDUC} + \beta_{y0} + \beta_{y1} \text{GROWTH}_{-1} + \beta_{y2} \text{WGROWTH}_{-1} + \beta_{y3} \text{LATIN} + \beta_{y4} \text{AFRICA} + u_y$$

Both political and economic variables are found within each formula; however, as mentioned before, certain variables are only within one of the equations. The educational variable, highlighting the importance of human capital, is only found within the growth equation. However, while human capital is clearly seen as important within economic growth, its role within political instability is not as certain, isolating it within the growth equation. The past occurrences of governmental change affect current economic growth not directly, but rather through the fear that the instability will carry on into future years.

According to the results found by Alesina, Ozler, Roubini and Swagel, they determined that political instability does have a negative impact upon economic growth. The correlation is strong enough that it is labeled as statistically significant. An altering in the government from zero to one reduces the economic growth rate by 1.3 to 1.4 percent per year. Since the average growth rate per year is 2.8 percent this is quite a

decrease. However, other studies, with less explanatory variables such as educational levels and world growth, did not come to this conclusion due to alterations in their model (Londregan and Poole 1990).

However, they discovered that low economic growth does not influence the likelihood of a governmental swap. They came to the conclusion by analyzing the statistically insignificant growth rates, seen by the GROWTH column. Yet when the minor governmental changes, MCHANGE, is eliminated and only coups are considered, growth becomes a much more significant factor within political instability. In fact, the impact becomes quite large.

Beyond the discovery that economic growth did not have as strong of a connection as political instability did, their calculations produced some interesting results. They found that their indicator for world growth was significant in both samples and had a strong impact on individual economies. Each one percent increase in the average of the economies of the G-7 nations (France, Germany, Italy, Japan, the United Kingdom, the United States and Canada), the individual country growth will rise by a half a percent. A positive coefficient on the world growth equation, WGROWTH (-1), showed that citizens do compare their growth rate with that of the world average. This could be used to explain that when a nation is poorly performing compared to the rest of the world, citizens are more likely to attempt to incite some level of change amongst their superiors. This could potentially be utilized as a measure of support for the contagion theory.

Additionally, the educational component was reaffirmed to have a positive effect on the growth equation (Barro 1991). The past dependent variable, GCHANGE (-1), was

statistically significant which proves that these governmental changes tend to be consistent and increase in frequency after time.

The dummy variables for specific regions also yielded some interesting results. As expected from the high levels of violence and consistent political instability, Latin America had high levels of correlation. However, Africa's levels were lower than anticipated. This could be due to the strong authoritarian regimes within the region and the unlikelihood that they would want to report every instance of political unrest that they could subdue. This is also true of their low growth, if the nations were not suspected for underreporting true statistics, this survey may have been able to produce more accurate results of the region.

In conclusion, their study found that political instability certainly reduces growth. This is only intensified when a political change such as a coup takes place, where the overthrow is much more violent and there is a larger change in ideology. Similarly, whenever a country has a history of political changeovers, their economic growth suffers as a result. However, their conclusion on economic growth impacting political stability is still unclear and merits further investigation.

### **Methodology**

While the study above yielded interesting results, their data only captured up to 1982, proving a new study needed to take place. Therefore, this model examined above will be projected onto the Arab Spring, particularly the nations of Tunisia, Egypt and Syria. The regressions will analyze which of the factors addressed, namely the enrollment rate of schools as well as the GDP growth of each nation, has the largest impact leading a nation to incite a revolution. Additionally, these models will help determine which factor,

political instability or economic growth, will have an ultimately stronger correlation over the other.

Revolutions and Coups				
Tunisia	1987	2010		
Egypt	1952	1977	2011	
Syria	1963	1966	1970	2011

The chart above highlights what years revolutions and/or coups took place in the respective countries analyzed. As noted earlier, Syria has the largest amount of revolutions/coups occurring since their independence. Additionally, their coups occur the closest together, suggesting some form of predisposition during a time of crisis. Egypt's revolutions were increasingly spaced out, reinforcing the belief that they were once one of the more stable countries within the area. Finally, Tunisia had its only form of political unrest the closest to the events of the Arab Spring. This could potentially show the nation beginning to set the stage for a revolution.

The same coefficients provided from the original paper discussed by Alesina will be utilized. These coefficients are listed below in the corresponding table. By filling in the corresponding coefficients, we are left with the following equation to determine if a coup or revolution would occur within a specific year or not.

$$\text{Prob (GCHANGE)} = \phi (-.178\text{GROWTH} + .258\text{GCHANGE}_{-1} - 0.604 - 1.432\text{GROWTH}_{-1} + 2.227\text{WGROWTH}_{-1} - .42\text{AFRICA})$$

The variable  $-.147(0)$  is void because it was used as a representative for if the country happened to be within Latin America. Since the focus of this study is limited to three countries, two of whom happen to be within Africa, this dummy variable will never have an impact upon the equation. Similarly, the dummy variable indicating whether or

not the nation examined was within the continent of Africa. So with the nations of Tunisia and Egypt, this variable will become a 1 for a positive while with Syria it will not be a part of the equation.

Data was gathered assessing the GDP growth levels in percentage terms of each country from 1980-2010 from the World Bank's records. Using this data,  $c^*$  terms, excluding the error component  $u_c$ , were able to be found for each year for each specific country. These specific tables can be found in the corresponding appendix. After finding accurate measures for the  $c^*$  variable, actual probability levels of a governmental change were able to be predicted using a normal distribution.

After calculating the probability that a nation will undergo some form of political revolution in each sample year, it is important to widen the focus to determine the impact it will have on ultimate economic growth. The same equation utilized by Alesina et al will be used again; however, this time there will be no omissions. The same coefficients will be utilized. Additionally, the dummy variable for Latin America will be excluded completely and the dummy variable for Africa will only have a role in the analysis of the countries of Tunisia and Egypt, similar to the first equation. By filling in the corresponding coefficients, we are left with the equation below.

$$\text{GROWTH} = -.013\text{GCHANGE} + .014\text{EDUC} - .007 + 0.114\text{GROWTH}_{-1} + .554\text{WGROWTH}_{-1} + -.016\text{AFRICA}$$

With the levels of governmental change being the original  $c^*$  values found by the first equation. The world growth and GDP growth variables remain the same as they had in the previous equation. Additionally, the education levels reflect the net intake of

primary school enrollment in percentage terms collected from 1980 onward from UNESCO.

Running analysis on the affect of economic growth was slightly more difficult. It was impossible to find a complete set of data running spanning from 1980 to 2010. Gathering data presented the most challenges when examining the nation of Egypt and an incredibly incomplete set of data points were utilized for the overall formula.

It is important to note that this predicted growth equation will not exactly model the direct growth because of the addition of the error term in the above equation. However, there is no way to discover the value for either error term, it is safe to make the assumption that both error terms equal zero and have no effect on the ultimate equation.

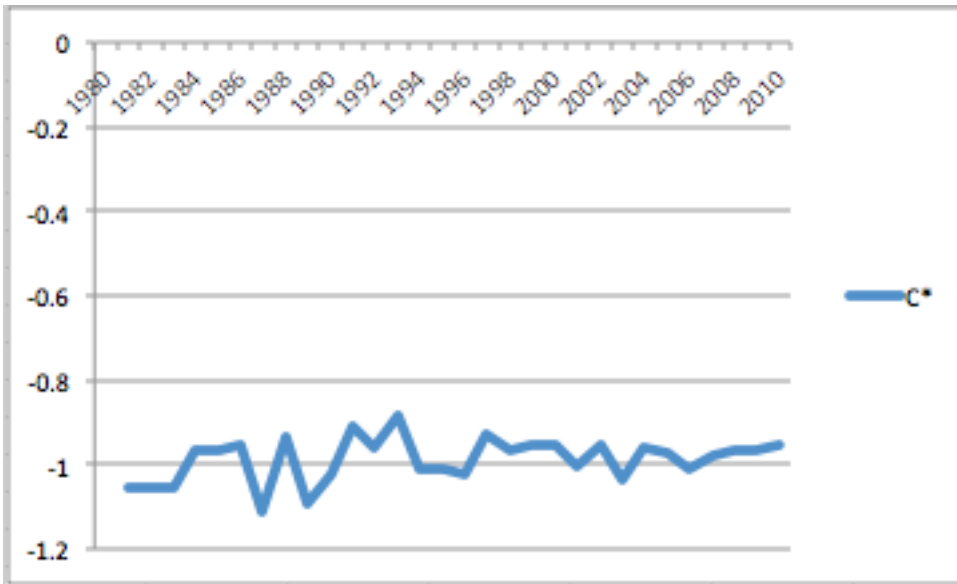
## **Results**

### Probability of Governmental Change

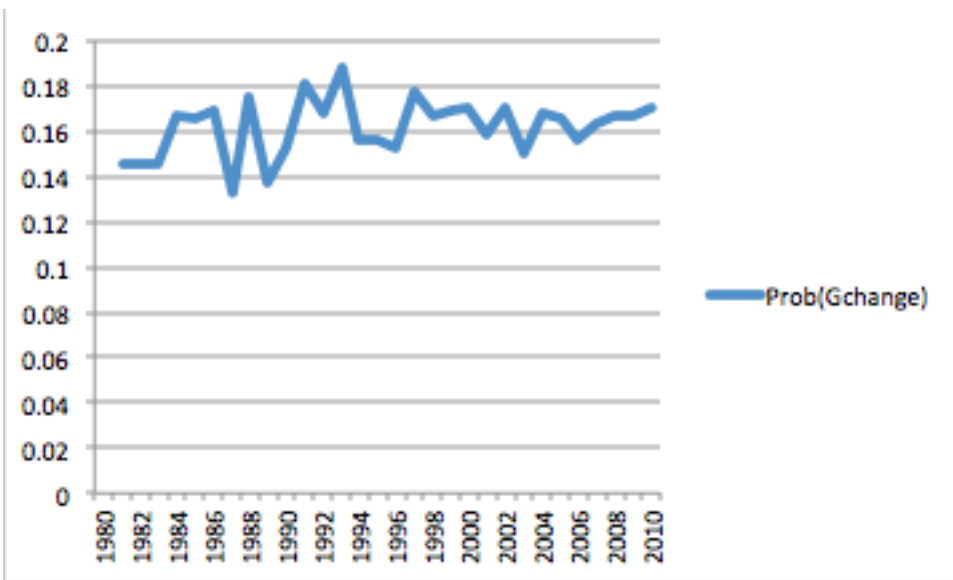
#### Tunisia

After performing the necessary calculations for Tunisia, the corresponding  $c^*$  and probability of a governmental change variables were discovered for each corresponding year. When plotted on a line graph, some interesting trends were noticed for both the  $c^*$  variable as well as the probability of a governmental change. The probability of a governmental change stayed between .15 and .20, which is concurrent with the results of Alesina, et al.

Graph:  $C^*$  Value on Tunisian Economy



Graph: Probability of Government Change Value on Tunisian Economy



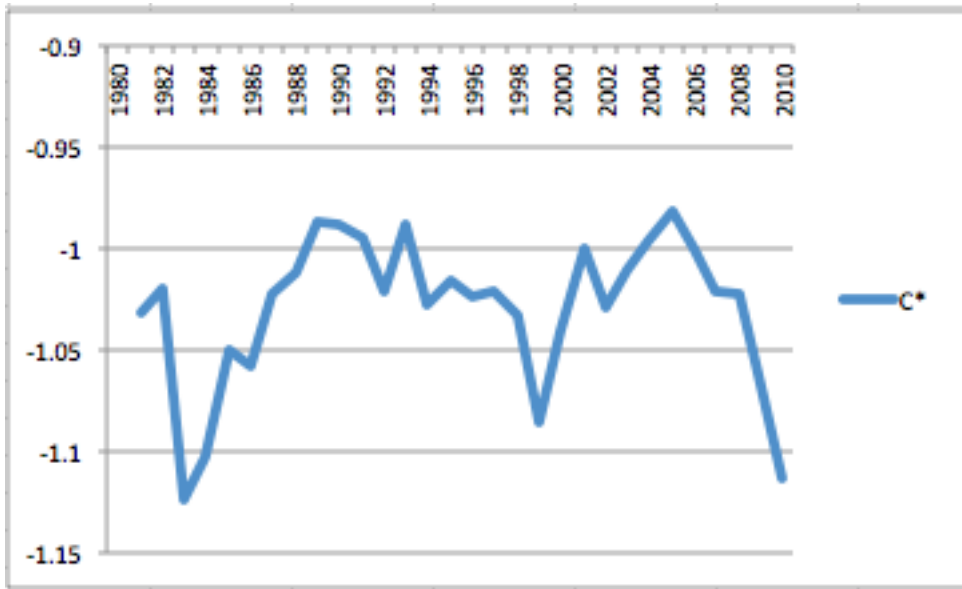
One thing worth noting instantly is the similarity between the two graphs. They both take roughly the same path, though it is interesting that the probability of a governmental change is a much sharper graph that appears to be pressed closer together. This shows an incredibly strong correlation between the  $c^*$  value and the ultimate affect it could have on the probability of a nation undergoing some forms of governmental upheaval.



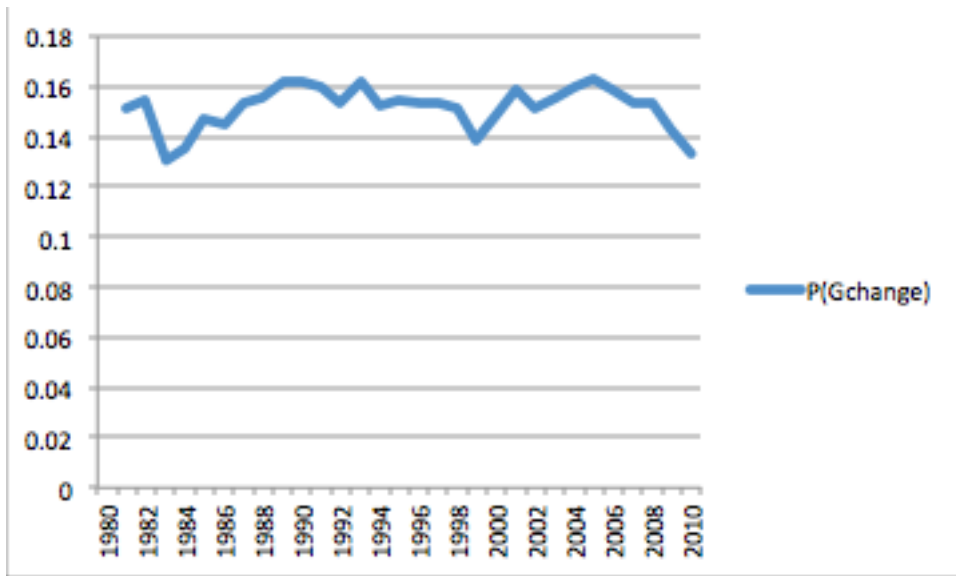
Within their history, the nation has had two revolutions resulting in a governmental change. The first one occurred in 1987 and the second in 2010. When examining the graph, this shows some interesting results. The probability of a coup actually changes during those time periods; there is a noticeable peak directly during the year the coup actually happened. Additionally, there is a gradual increase in probability right before the Arab Spring, showing that the economic could be steadily declining, predicting an impending revolution. However, there is an unexplainable spike in probability around the years of 1992 and 1994, during which no military overthrow occurred.

Egypt

Graph: C\* impact on the Egyptian economy



Graph: Probability of governmental change on the Egyptian economy

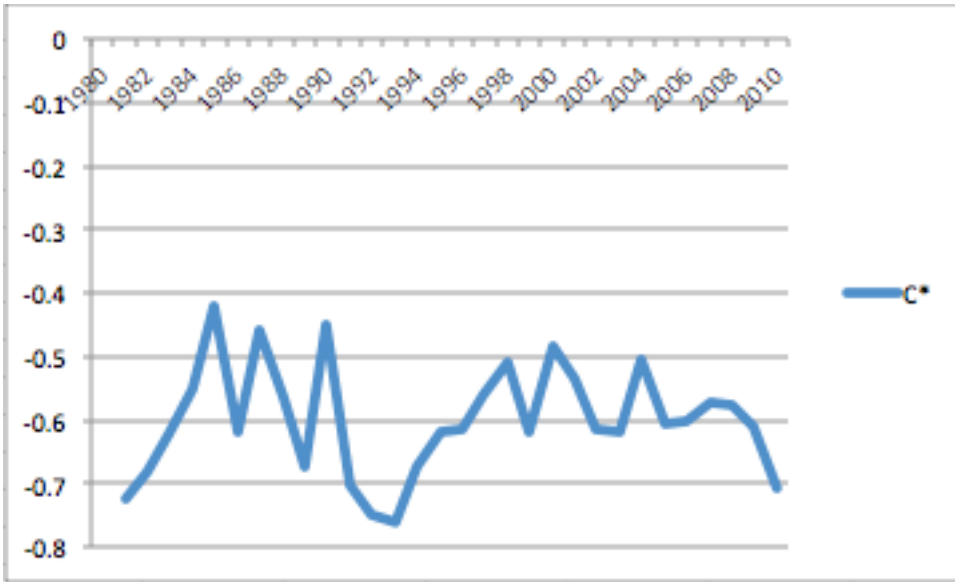


Contrary to the case of Tunisia, the graphs between  $C^*$  and the probability of government change are not mirror images. They follow the same general pattern; however, the probability of governmental change is quite understated in comparison. The drastic spikes and declines in the  $C^*$  graph demonstrate that the GDP growth had quite a strong impact which did not have as much of a change within the probability of governmental change.

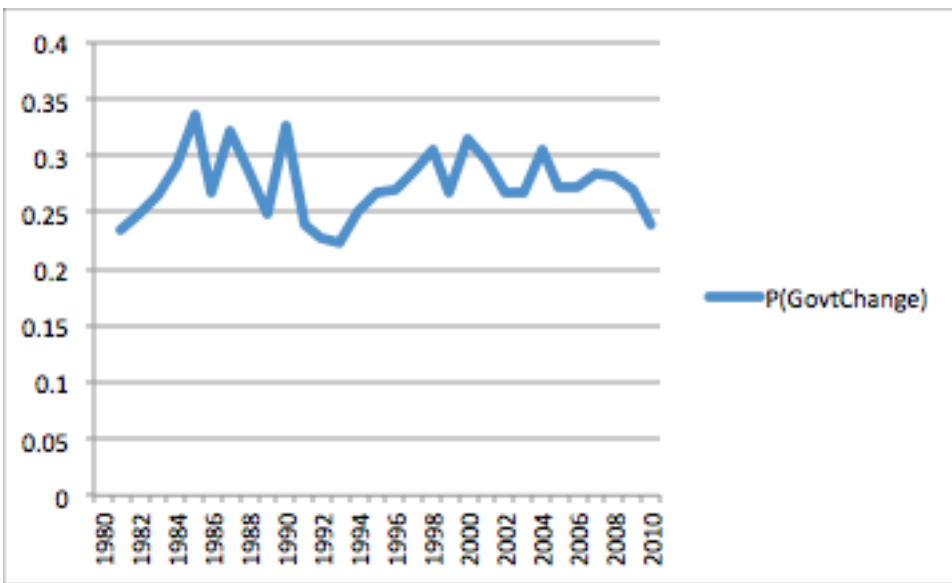
Interestingly enough, the Egyptian economy has a drastic drop in probability of a governmental overthrow exactly when the Arab Spring occurred. However, the data does not extend far enough back, beginning only in 1980, to fully estimate whether this phenomenon could also occur during previous coups occurring within the country.

Syria

Graph:  $C^*$  impact on the Syrian economy



Graph: Probability of governmental change within the Syrian economy

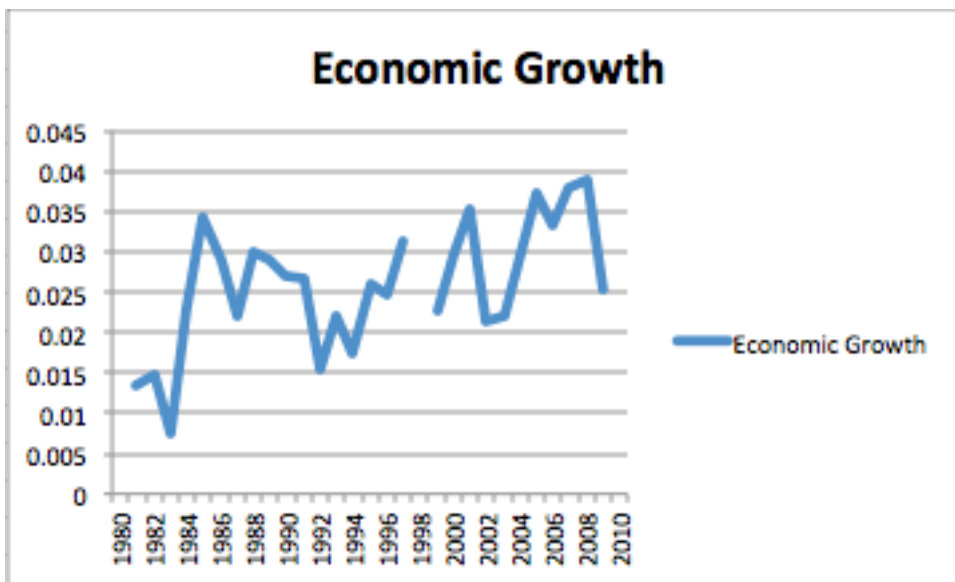


The two graphs have similar patterns, reinforcing the correlation found between the other two countries' analysis. Syria's graphs are similar to Tunisia's in their sharpness and the lagged impact within the governmental change graph. The incredibly strong spikes, particularly around the years of 1984 to 1990, from the original graph do not link to as strong levels of probability that the government will ultimately be other thrown within the year. However, it is something interesting to note.

The decline in probability of a governmental coup is still there directly before the events in the Arab Spring took place. Following the logic that a drastic decline in probability of a governmental coup could actually suggest a coup, within Egypt and Syria, one would anticipate there was governmental upheaval during the years of 1992 that saw a parallel spike downwards.

## Economic Growth

Tunisia



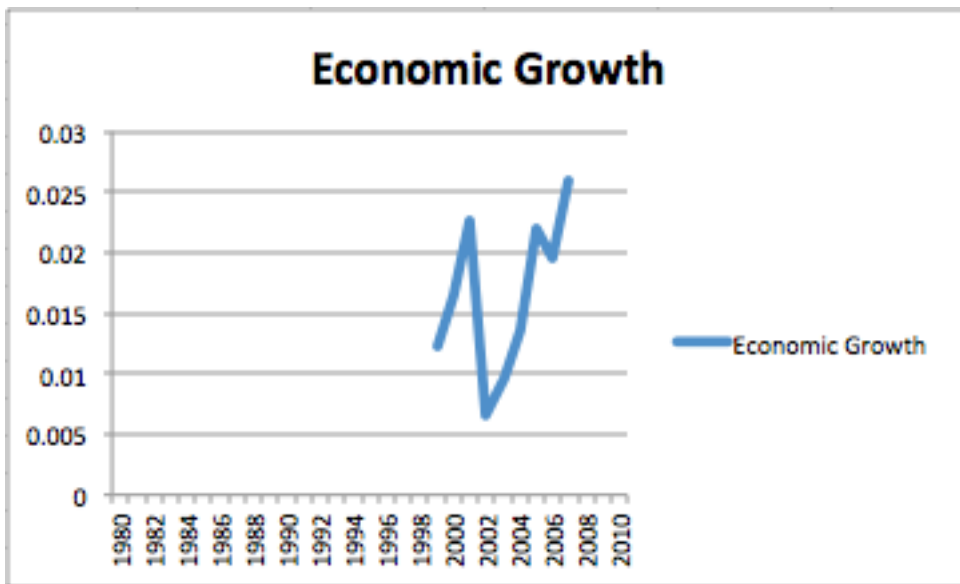
Examining the graph of the economic growth provided some interesting results. While not a direct opposite, the graph certainly did not match as closely as the one for  $c^*$  and probability of governmental change did.

However, one would anticipate these graphs to almost mirror each other. If the probability of a governmental coup would increase than the economic growth should drop due to the factors discussed earlier. This did seem to be the case in the early years, particularly in 1982 when there was a drastic drop in economic growth that could be linked to the rising probability of a governmental upheaval. Interestingly, directly after

the drop in 1982, there was a huge spike in economic growth, perhaps a chance for the nation to attempt to stabilize.

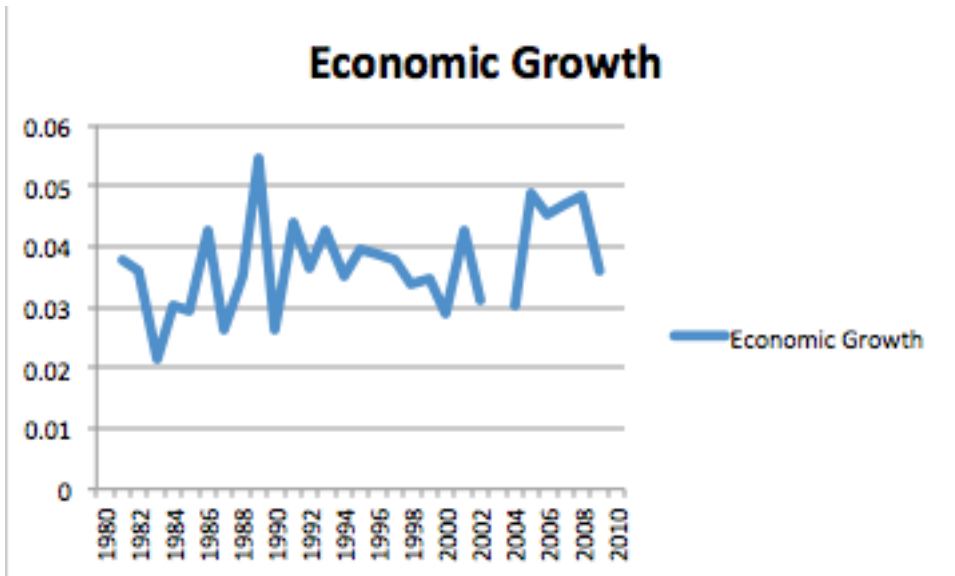
Interestingly enough, the economic growth began to plummet years before the Arab Spring actually occurred which could have been considered a flag that some political turmoil could be in the country's future. The same thing could be noted during the nation's military coup of 1992.

Egypt



Due to incredibly limited amount of data, it is incredibly difficult to make any set of assumptions from this level of data. However, the drastic drop in economic growth from 1998 to 2000 is consistent with a increasing probability of a governmental rebellion. From the initial drop, the economic growth only grows which is also consistent with the falling probability.

Syria



Syria has significantly more data to analyze. The graph of economic growth is not as consistent with the probability of governmental change. However, it still has the drastic drop in economic growth a few years prior to the Arab Spring similar to Tunisia.

Interestingly, they have the same tumultuous spikes during the time period of 1985 to 1990 that C\* and the probability of governmental change picked up upon. However, these sharp decreases noticed within the graph do not correlate to any actual governmental overthrow.

Overall, it is interesting to note that predicted coup probabilities are generally higher in Syria than in the other countries since they are the country with the highest amount of coups of those analyzed.

### **Conclusion**

There is definitely some relationship between economic growth and political stability. Without a stable governmental system, potential investors would be unlikely to invest their assets within a country. On the other spectrum, with a shaky economy the citizens are more likely to express their frustrations by attempting to install a new

government. However, this model does not accurately predict if economic growth was the strongest factor within their reason for a rebellion. There is something different about North Africa which has no red flag available to make an accurate prediction.

One interesting conclusion to glean from the analysis was the fact that model predicted military overthrows correctly for the nation of Tunisia, yet seemed to be directly the opposite for the other two countries. This did not coincide with the thinking of the paper, which assumed that the sharpest spike in probability would occur right before the revolutions began. One explanation for this drastic deviance could be the nature of the regimes within Egypt and Syria. Due to their controlling nature, they could inflate their GDP statistics in an attempt to retain control by hiding how much the economic situation has deteriorated.

The results obtained within this paper are not strong enough to make assumptions about whether these factors, such as GDP growth and education levels, are strong enough to have a definite impact on the outcome of the nation. Indeed, the fact that the model used predicted the lowest levels of probability for a governmental coup when directly before one occurred is an excellent example of this. While there is not sufficient evidence to make the assumption that economic growth is the most important factor related to political instability, there is definitely enough evidence to make the claim that they are linked in some fashion. In particular, the GDP growth changes appear to have a stronger correlation than that of education levels. Further analysis should be taken to better understand the relationship.

Though these results are inconclusive, there are still other conditions to be taken into account before a full assumption could be made. The two factors, resource curse and

coup contagion, discussed earlier in the paper could be playing crucial roles not addressed within the paper. The impact of the resource curse and that overall impact upon the economy in general could be stagnating the growth, preventing regimes from making any steps towards positive economic growth. Additionally, contagion effects could disinhibit other countries to realize that a revolution and change is within their reach as well. Other key factors about the economy itself, such as employment rates and the nature of the regimes, could be significant factors within future analysis.

Moving forward, those variables need to be taken into account to have a better understanding of the situation at hand. Additionally, more complete data, particularly within the education variable, would allow for more certain conclusions to be drawn from the analysis.



## Bibliography

- Achy, L. (2011, March 31). SYRIA: Economic hardship feeds social unrest. Retrieved from <http://latimesblogs.latimes.com/babylonbeyond/2011/03/syria-economy-unrest-carnegie-middle-east.html>
- Ades, Alberto, and Hak B. Chua. "Thy Neighbor's Curse: Regional Instability and Economic Growth." *Journal of Economic Growth* 2.3 (1997): 279-304. JSTOR. Web. 3 Oct. 2011.
- Alesina, A., Ozler S., Roubini, N., Swagel P (1996). Political Instability and Economic Growth. *Journal of Economic Growth*, Vol. 1, (No. 2). 189-211.
- "Arab Leaders Fear Coup Contagion." STRATFOR. 18 Jan. 2011. Web. 28 Nov. 2011. <[http://www.stratfor.com/geopolitical\\_diary/20110117-arab-leaders-fear-coup-contagion](http://www.stratfor.com/geopolitical_diary/20110117-arab-leaders-fear-coup-contagion)>.
- Ayari, S. (2011, November 10). Oil Discoveries Increase International Interest in Tunisia. *Tunisia Live*. Retrieved March 19, 2012, from <http://www.tunisia-live.net/2011/11/10/oil-discoveries-increase-international-interest-over-tunisia/>
- Barro, R (1991). "Economic Growth in a Cross Section of Countries." *Quarterly Journal of Economics* 106, 407-444.
- Department Of State. The Office of Electronic Information, B. of P. A. (2012, March 9). Tunisia. Background Notes. Retrieved March 19, 2012, from <http://www.state.gov/r/pa/ei/bgn/5439.htm#econ>
- Egypt trade, exports and imports. (2010, March 29). Retrieved from [http://www.economywatch.com/world\\_economy/egypt/export-import.html](http://www.economywatch.com/world_economy/egypt/export-import.html)
- Govea, Rodger, and Gerald West. "Riot Contagion in Latin America, 1949-1963." *The*

Journal of Conflict Resolution 25.2 (1981): 349-68. JSTOR. Sage Publications, Inc. Web. 20 Nov. 2011. <<http://www.jstor.org/stable/173826>>.

Hill, Stuart, and David Rothchild. "The Contagion of Political Conflict in Africa and the World." The Journal of Conflict Resolution 30.4 (1986): 716-35. JSTOR. Web. 21 Nov. 2011. <<http://www.jstor.org/stable/174082>>.

Jodice, D. and D.L. Taylor (1983). World Handbook of Social and Political Indicators. New Haven; Yale University Press.

Kirkpatrick, D. D. (2011, February 11). Egypt Erupts in Jubilation as Mubarak Steps Down. *The New York Times*. Retrieved from <http://www.nytimes.com/2011/02/12/world/middleeast/12egypt.html>

Londregan, J. and K. Poole. (1990). "Poverty, the Coup Trap, and the Seizure of Executive Power." World Politics 42, 151-183.

NPR Staff. (2011, December 17). The Arab Spring: A Year Of Revolution. *NPR.org*. Retrieved from <http://www.npr.org/2011/12/17/143897126/the-arab-spring-a-year-of-revolution>

Starr, S. (2011). Inside Syria's Economic Implosion. *Foreign Policy*. Retrieved March 19, 2012, from [http://www.foreignpolicy.com/articles/2011/11/15/inside\\_syrias\\_economic\\_implosion?page=full](http://www.foreignpolicy.com/articles/2011/11/15/inside_syrias_economic_implosion?page=full)

Syria. (n.d.). *CIA- The World Factbook*. Retrieved March 19, 2012, from <https://www.cia.gov/library/publications/the-world-factbook/geos/sy.html>

Syria Economy: Facts, Data, & Analysis on Economic Freedom. (n.d.). Retrieved March 19, 2012, from <http://www.heritage.org/index/country/syria>

Tunisia. (n.d.).*CIA- The World Factbook*. Retrieved March 19, 2012, from <https://www.cia.gov/library/publications/the-world-factbook/geos/ts.html>

Tunisian Economy. (n.d.).*Tunisian Economy*. Tunisian.com. Retrieved March 19, 2012, from <http://www.tunisia.com/tunisian-economy/>

Tunisian Oil and Gas. (n.d.).*Dominion Energy Plc*. Retrieved March 19, 2012, from <http://www.deplc.com/tunisian-oil-and-gas>

Wingfield, B. (n.d.). Making sense of u.s. foreign aid to egypt and elsewhere . Retrieved from <http://www.forbes.com/sites/brianwingfield/2011/01/29/making-sense-of-u-s-foreign-aid-to-egypt-and-elsewhere>

## Appendix

Tunisia data collection

Year	Tunisia GDP	World GDP	C*	Education	Economic Growth
1980	0.00074	0.02009		0.7975562	
1981	0.0005522	0.02213	-1.05506	0.8163204	0.013358486
1982	-0.00482	0.00914	-1.0560873	0.8412391	0.014829453
1983	0.04674	0.02809	-1.0528226	0.8716398	0.007403732
1984	0.05731	0.04607	-0.9683354	0.9003191	0.023083047
1985	0.05668	0.03644	-0.9688292	0.9086794	0.034372411
1986	-0.01453	0.03479	-0.9561483	0.9187302	0.028941431
1987	0.06701	0.03629	-1.1126372	0.9270529	0.022060264
1988	0.00071	0.04478	-0.9347069	0.9258893	0.029857439
1989	0.02579	0.03745	-1.0932099	0.9301993	0.029123579
1990	0.07075	0.02984	-1.0255056	0.9243413	0.026959711
1991	0.03903	0.01484	-0.9118122	0.9366995	0.026564211
1992	0.07807	0.02049	-0.9619783	0.9456382	0.015415433
1993	0.02191	0.02062	-0.8831502	0.9596341	0.022167269
1994	0.03181	0.03394	-1.0107756	0.962459	0.017535729
1995	0.02347	0.03285	-1.0076085	0.9672436	0.026069421
1996	0.07147	0.03743	-1.0254361	0.9657387	0.02472549
1997	0.05439	0.04037	-0.9256219	0.9537862	0.031269892
1998	0.04965	0.0258	-0.9652757	0	
1999	0.06018	0.03629	-0.9568347	0.9427931	0.022591254
2000	0.043	0.04831	-0.9505456	0.9557161	0.029702298
2001	0.0485	0.02282	-1.0014809	0.9691629	0.035253272
2002	0.017	0.02891	-0.9538147	0.9807833	0.021301838
2003	0.05471	0.03613	-1.0339713	0.9814921	0.022136656
2004	0.05959	0.04917	-0.9626513	0.9829502	0.029528729
2005	0.04	0.0448	-0.9696789	0.9820533	0.037388012
2006	0.05654	0.05079	-1.0081142	0.9830113	0.033246843
2007	0.06259	0.05182	-0.9800407	0.9785468	0.038023404
2008	0.04521	0.03021	-0.9641957	0.9774078	0.039061793
2009	0.0311	-0.00604	-0.9655029	0.984772	0.025228626
2010	0.03053	0.04217	-0.9535973		

Syria Data Collection

Year	Syria GDP	World GDP	C*	Education	Economic Growth
1980	0.10493	0.02009		0.8580505	
1981	0.08463	0.02213	-0.7245835	0.8604557	0.037557845
1982	0.02583	0.00914	-0.6805044	0.8652444	0.035867819
1983	0.01605	0.02809	-0.6234907	0.8718158	0.02131898
1984	-0.06498	0.04607	-0.5528607	0.8926352	0.030075642
1985	0.07296	0.03644	-0.4213376	0.9099914	0.029332329
1986	-0.04757	0.03479	-0.6188594	0.9289662	0.042555899
1987	0.01251	0.03629	-0.4606292	0.9551201	0.026210541
1988	0.12721	0.04478	-0.5637399	0.9567351	0.03525371
1989	-0.06067	0.03745	-0.6756404	0.9596005	0.054527792
1990	0.10358	0.02984	-0.4521567	0.9586126	0.026129533
1991	0.10727	0.01484	-0.7049669	0.9568255	0.043899607
1992	0.13246	0.02049	-0.7481398	0.9608679	0.036628109
1993	0.07409	0.02062	-0.7612395	0.9613997	0.042807609
1994	0.05534	0.03394	-0.6740267	0.9637888	0.03512513
1995	0.05423	0.03285	-0.6173154	0.9642761	0.039636486
1996	0.02966	0.03743	-0.6137799	0.963651	0.038851373
1997	-0.0109	0.04037	-0.5611763	0.9653904	0.037928218
1998	0.05554	0.0258	-0.5083733	0.9427577	0.033929841
1999	-0.03121	0.03629	-0.6205213	0.9355949	0.034789866
2000	0.02295	0.04831	-0.4825746	0.9388295	0.028963802
2001	0.0368	0.02282	-0.5358284	0.9457573	0.042586412
2002	0.05897	0.02891	-0.6163741	0.9469686	0.031107904
2003	-0.02037	0.03613	-0.6204366		
2004	0.06903	0.04917	-0.506656	0.9211452	0.030176401
2005	0.06215	0.0448	-0.6044121	0.9217403	0.048871321
2006	0.05046	0.05079	-0.6022111	0.8960628	0.045277923
2007	0.05675	0.05182	-0.5732509	0.9073586	0.047045382
2008	0.04477	0.03021	-0.5778319	0.9161454	0.048515631
2009	0.06013	-0.00604	-0.6115361	0.9294661	0.035802615
2010	0.03233	0.04217	-0.709312	0.9349641	

## Egypt Data Collection

Year	Egypt GDP	World GDP	C*	Education Levels	Economic Growth
1980	0.03409	0.02009			
1981	0.02198	0.02213	-1.0319889		
1982	0.07296	0.00914	-1.0191787		
1983	0.08876	0.02809	-1.1239232		
1984	0.08021	0.04607	-1.1028253		
1985	0.07425	0.03644	-1.0494793		
1986	0.04759	0.03479	-1.0576451		
1987	0.04273	0.03629	-1.0222775		
1988	0.03994	0.04478	-1.0114809		
1989	0.02993	0.03745	-0.9867966		
1990	0.0235	0.02984	-0.9876416		
1991	0.021	0.01484	-0.9949363		
1992	0.003	0.02049	-1.0215573		
1993	0.029	0.02062	-0.9878268		
1994	0.04188	0.03394	-1.0270619	0.8752541	0.003541817
1995	0.04484	0.03285	-1.0163693		
1996	0.04879	0.03743	-1.0237386		
1997	0.05919	0.04037	-1.0210465	0.9155582	0.015591285
1998	0.07543	0.0258	-1.0322826		
1999	0.0611	0.03629	-1.085435	0.9183086	0.01227677
2000	0.05383	0.04831	-1.0402591	0.9253917	0.016397514
2001	0.03524	0.02282	-0.9997709	0.9366428	0.022716699
2002	0.03186	0.02891	-1.0293146	0.9493901	0.006575271
2003	0.03193	0.03613	-1.0109245	0.961369	0.009637656
2004	0.04092	0.04917	-0.996546	0.9737258	0.013648991
2005	0.04472	0.0448	-0.981056	0.9718639	0.021928755
2006	0.06844	0.05079	-1.0004518	0.9481329	0.019530871
2007	0.07088	0.05182	-1.0215134	0.9766573	0.025939362
2008	0.07156	0.03021	-1.0228347		
2009	0.04674	-0.00604	-1.067516	0.9798099	0.015690039
2010	0.05147	0.04217	-1.1135444		



## ACADEMIC VITA

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Bachelor of Arts Degree in Economics, Penn State University, Spring 2012  
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Thesis Title: Economic Growth and its Impact Upon Political Instability: An In-  
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### **Work Experience:**

United States Agency for International Development Social Media Intern (Fall  
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United States Agency for International Development Special Events and Protocol  
Intern (Summer 2011)  
International Center for the Study of Terrorism Research Assistant (Spring 2011)  
The Pennsylvania State University Undergraduate Grader (Spring 2009-Fall 2010)

### **Awards & Recognition:**

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Lion's Paw Senior Society  
  
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Student Programming Association Director of Operations (May 2011-present)  
  
Atlas Benefitting THON Donor and Alumni Relations Chair (May 2011- present)  
  
Homecoming Alumni Relations Captain (May 2011-October 2011)  
Student Programming Association Distinguished Speaker Series Chairwoman  
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Atlas Benefitting THON Merchandise Captain (May 2009-May 2011)