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Letter from the Editors

The global landscape of political economy is changing. Prior to 2008, wealth levels reached all time highs all across the world as the developed got wealthier, the developing accelerated, and the impoverished fell in number. The still recent crisis slowed and in some cases reversed that trend. Subsequent research tried to understand exactly what had occurred, some even published in prior editions of this journal.

Researchers have moved past looking at the mechanics of that crisis and have started asking pragmatic questions of how do we recover and direct society in a different way than we have before: Despite success in some places, why do pockets of poverty and oppression remain? What effect does dependency on foreign oil have on society and what could a different energy future look like? What can the state do to allow its citizens to be productive members of society? How can economic polity decide the fate of a nation? These are not simple questions nor do they beget simple answers. Four authors lead the way in answering these questions by applying reasoned and disciplined thought in their own way.

We hope you will enjoy the research inside. The papers presented here do not outline a model society nor do they make claims of absolute truth. Instead, they represent the opening remarks to the discussion that will shape the global society that we live in. Thank you for reading and continuing to rethink your world by contributing to the debate.

Thank you for taking part,

Alec Loudenback *Jason Fertig*
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Evolving Perceptions of Economic Opportunities in Post-Apartheid South Africa's Cape Town Townships

Eric Adams
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Introduction

Academic analyses of economic development in countries experiencing the consolidation of democracy or those undertaking vast socioeconomic reformations tend to focus on raw high level data. Rarely have these studies comprehensively surveyed a populous for its receipt of direct and indirect attempts designed to foster economic progress. Macroeconomic measures for unemployment, income distribution, consumer spending, and exchange rates do not paint an accurate picture of the economic realities confronting the average citizen. Beyond the growing skepticisms held by many economists concerning these economic indicators, developmental experts in recent years have stressed the importance of measuring both the planned and inadvertent impacts of a policy measure at a granular level. Statistics are merely numbers and when their context is misunderstood or the sources misrepresentative, the data cannot sincerely measure the progress (or decline) effected by an economic policy. The inclination of statisticians to overlook the lives and opinions of the franchised may deny the state's economic planners valuable insights and sources of feedback. Assessment systems which appropriately evaluate the effectiveness of economic policies and social programs need to be created.

South Africa is an exceptional case for a revitalized academic study due to its recent political history and demographic struggles under the world's spotlight where it still remains. In addition, South Africa has a comparatively advantageous position of influence among other sub-Saharan African nations. Demands for drastic socio-economic reform in South Africa have come through various channels over the years and have taken many forms. Given the pronounced role of social movements and their demands of restorative justice sought through economic policies, many development experts have lauded South Africa's experiences as becoming instrumental in their applications to future reform movements across the globe. Considering the ramifications that a bottom-up focused survey may preclude, this research sought to emulate the approaches taken by emergent developmentally-focused surveys.

Developmental experts have heatedly debated the types of reforms and policies necessary to bridge South Africa from the past into the post-apartheid era of the twenty-first century. Even further, domestic debates on the ideal paths for economic restoration, reconciliation and empowerment for the multitudes of black and coloured (broad category of mixed, non-African, -Indian, or –White persons) citizens have further polarized the political field. The inception of these hurdles began prior to the African National Congress's ascent to office with Oliver Tambo's leadership from exile and his diplomatic wisdom which worked to avoid policy commitments and against the solidification of political sects that planned for future (at the time) democratic reconstruction[1]. Later, the initial policies of the new government in 1994 made feeble attempts to design economic policies directly calling for structural reorganization beyond idealistic rhetoric. It has even been said that there is remarkable continuity

1 "Development Dilemmas in Post-Apartheid South Africa" Bill Freund, Page 8.

with the economic planning pursued by Mandela to that of his predecessor F.W. de Klerk of the prior regime. The majority of Mandela's initial policies under the Reconstruction and Development Programme (RDP) were soon phased out. Later, the National Economic Development and Labor Council sought to bridge the bureaucratic and civil societies during this crucial stage of transformation. Community organizations, business and labor organizations were touted as informal corporate governance during the late 1990's; however, it soon devolved into a "moderately useful talk-shop with very limited influence on state policy-making" (Freund, p.9).

Concurrently, the Congress of South African Trade Unions (COSATU) made political interventions that challenged the popular policy assumptions about globalization and broader business interests as legitimizations for reform programs. COSATU has stood up for unemployment, education and working-class interests more than any other single group in South Africa since 1994. The COSATU has had an active role in producing a worker-friendly constitution, progressive labor legislation, and the promotion of collective bargaining[2]. Despite its apparent activism, its true capacity to force successful political reconsiderations is a separate debate. All in all, the critical impediment that South African reformers face is implementation. There are many fruitful ideas produced domestically, to be found in international forums, or others that have been proven by other nations, yet finding the appropriate adjustment to make these programs a success in the unique South African social order currently plagues the government's economic agenda.

The government is forced to reconcile, and most notably recognized by the Mbeki regime in 2003, the present global environment while inwardly addressing the deep social and economic relationships its society has developed over the past century. Faced with a significant deficiency in human capital, a need for urban policies that can cope with drastic in-migration and a quickly growing working class, the government has largely faltered in providing solutions even on a small scale. The black empowerment system (BEE) sought to increase black participation in management, yet fostered mediocrity and corruption. The promotion of various national and provincial housing policies has led to an abundance of poor quality residences and others that cannot be afforded by the irregular family structures and unpredictable incomes of South Africans. Finally, the lack of effective transitional policies, including housing rental schemes and skills training programs are just a few of the examples of the government's reform shortcomings in the past 15 years (Freund, p.15-21). The majority of the early economic reforms in South Africa (1994-96) were implemented on a national level while provincial and local governments continued to establish, staff, and organize budget priorities. This project's primary research efforts explored economic reform policies particular to Cape Town, and when available, further examined those specific to the township communities. In many instances, certain reforms were not designed by local bodies, and provincial and national-level policies served as proxies in the research to determine the relationship to the township populations. This research pored over numerous reports of reform program goals, their anticipated outcomes, and expected benefits for intended beneficiaries.

In this hurried transition, economic planners had limited time to set up back-end impact measurement procedures. adaptedlargely After acquiring a comprehensive understanding of the economic reforms affecting Cape Town in the previous 15 years, the survey construction began.

2 COSATU, Cosatu Policy Submissions 1994-2004 (Cape Town: COSATU Parliamentary Office, CD, 2004).

Construction of Survey

The influence of developmentally-focused impact measurement techniques proved instrumental in designing the Cape Town economic survey. The adoption of policy or program-specific impact measurement is an approach increasingly used by local governments, NGO's, and socially-focused for-profit enterprises. The Progress out of Poverty Index (PPI) is a leading example that was conceived and first utilized by the Grameen Bank micro-finance institution. The survey collects responses to a list of ten brief questions that enable organizations to segment a population by poverty levels, assess their unique needs, and ideally track their ascent from poverty. At present, PPI surveys are created for individual countries and therefore inquire and collect results to tabulate the likelihood that a household's expenditures fall within country-specific poverty lines. These ten questions are specified following a detailed investigation which defines the types of purchases and levels of income that can constitute a proxy for the country's relative poverty line. Furthermore, PPI surveys are used by businesses and organizations with diverse means of combatting and alleviating poverty. Despite the poverty-focused specification of these surveys, the critical implications for this Cape Town survey lie in the method of design and the practical ease of administering.

Additionally, the adoption of micro data surveys in other economic venues provided useful guidance for the Cape Town survey. These periodically conducted surveys are instrumental in guiding resource allocations of policy decision makers. In the United States, a plethora of economic, demographic, and employment information is afforded through the decennial census, the American Community Survey (ACS), and the Current Population Survey (CPS). Together the data generated help determine the allocation of almost half a trillion dollars of federal and state funds annually. In South Africa, a close equivalent is the Income and Expenditure Survey (IES) which is conducted every five years, dissimilar to the ongoing monthly samples of the ACS and CPS data. However, the IES is conducted primarily to determine which goods/services South African households are consuming for the purpose of defining an appropriate basket of goods used in the CPI calculations. The annually and monthly reported CPI has obvious ramifications on national interest rates and inflation policies yet lacks relevance to the daily economic lives and realities confronting citizens. Other annual reports of agricultural productivity, capital expenditure and tourism are marginally more relevant to understanding the lives of the citizens yet these sector-level examinations are too high level for the purposes of understanding local variations; moreover, identifying variations caused by unique policy measures.

The irregular collection and lack of granularity of the data gathered by the South African government is a significant hurdle to understanding the economic realities faced by its citizens over time. Many of its statistical reports are published *periodically*, with no official regulation of this unstructured periodicity. When the government decided to move to 10-year from 5-year censuses, this created an even greater gap in the future data available to the government. At the time of this survey's construction, the 1996 and 2001 censuses were the only two conducted at a national level that focused on economic, demographic, and employment data. The next decennial census started in June of 2011, a month before this survey was administered, and not completed until the following year. In 2007, the Community Survey was administered at the provincial level for the purpose of reducing the data gap created by the switch in national censuses. The survey collected the standard census data in addition to questions about housing conditions and the consumption of durable goods.

Primarily inspired by the approach of the PPI survey and augmented by the topics and phrasing of the micro data surveys, I alone administered the final survey to 48 respondents. In order to examine the actual impacts of Cape Town's economic reforms as experienced by the township communities, first, a list of roughly 100 survey-style questions was created. Each question aimed to determine a specific, potential impact achieved through a local or relevant national/provincial economic program. Questions referenced topics ranging from personal experiences to observations of changes on a regional or national scale. The questions included on the South African Census and Community Survey were also added to the initial question list. After reorganizing the survey list into subsections by topic/type of reform, questions were edited to assure clarity and desired topic direction. The survey provided in the Appendix includes approximately a third of these questions and additionally with follow up questions for the purpose of clarifying and eliciting a sufficient response.

The seemingly ever-evolving process of designing survey questions is an art. To create a question that is concise yet elicits an expounding response from the respondent draws on the survey architect's ability to consider the perspectives of the respondent. On a basic level, the language and phrasing need to be colloquial, yet on a more intricate level the question cannot be too vague, unnecessarily complex, or even offensive. Furthermore, survey questions and their desired responses should be indicative of actual (or potential) economic change in the community and not simply built to measure how the surveyor would define change. The research on reform policies ensured that the question topics were objective yet consistent with reform targets. Finally, the surveyor must avoid framing questions that outwardly hint towards a specific answer and instead design open-ended questions each with an apparent direction.

Unlike the poverty-focused and micro data survey design, this attempt sought to collect economic sentiments in a panel data fashion all at once due to the constrained period of visit (six weeks). The PPI is created to be administered and tabulated by non-specialists, or in other words people who are not expert statisticians or data enumerators. After reviewing national household expenditure data and defining country-specific poverty lines the survey responses of varying magnitudes are assigned corresponding point values within a question for the household's final tabulation. These questions are purposely inexpensive to collect, easy to verify, are correlated with poverty, and are suspect to change as poverty status changes. Administering these ten questions seeks to identify the household's income level indirectly through its size, consumption of particular goods, and physical integrity of the dwelling itself. Due to the PPI's reliance on scoring systems and point values derived from specific responses, the panel and subjective nature of the data collection in this study will not adhere to the same survey construction. However, once again, the methodology underlying the selection and construction of each question on the PPI was instrumental to refining the topic areas and phrasing of the questions in the Cape Town economic survey.

The majority of micro data surveys, including the ACS in the United States and the IES in South Africa, also use the same questions between data collections for trend analysis. However, the questions are chosen less by their merit as indicators of a particular situation but rather as general measures assumed to accurately measure the economic or demographic landscape. For instance, basic questions cover household resident demographics, housing conditions/expenditures of the present and recent months, and employment situations of the present and recent months. Constrained by the period of study, the Cape Town economic survey will augment the subject matter developed using the PPI's approach with the phrasing and temporal considerations of the micro data surveys. Since the latter survey type emphasizes the simultaneous gathering of data from multiple intervals of the collection period (ACS within 1 year and IES within 5 years), the Cape Town economic survey's format will readily adopt similar phraseology to gather responses for 5-year panel intervals.

Presentation of Findings

Note on Data Cohort

During the data collection, I strove to survey a diverse cross-section of township inhabitants to guarantee the thorough sample would provide varied responses. As a result, the cohort of respondents and their respective life paths does not constitute the archetypal composition of the township population as a whole. For example, the proportion of households with land titles and the proportion respondents who have received an education whom I interviewed are higher among my sample than among the township populations in truth. By reason of this, I will not provide any calculated statistics for metrics, such as "land ownership," since such calculated data would not be indicative of actual figures.

On a separate note, in Cape Town there are numerous townships and informal settlement communities, and as the name suggests they are not all formally delineated. All of my respondents were current residents of at least one of the five townships where I administered the survey. The general reference to *Cape Town townships* or *township respondents* refers to those living in either the settlements of Gugulethu, Khayelitsha, Langa, Nyanga, or Imizamo Yethu. Only when explicitly noted otherwise is a figure referring to the country as a whole. References to the government include both only relevant nationally and regionally (Western Province and City of Cape Town) implemented programs and policies.

The Western Cape Province is home to more than 4.8 million individuals (over 50% are coloured)[3], one of the more unique provinces in the country, and economically it has the most highly-skilled and educated workforces and is home to some major economic players. It consistently has high school graduation rates in excess of 80% and as of 2005 the proportion of adults with at least a college degree was 4.8%[4]. Many of the primary financial institutions, petroleum companies, and insurance companies of South Africa are headquartered out of Cape Town[5]. Furthermore, according to the 2007 Community Survey "Approximately 3.9% of the Western Cape value added gross domestic product comes through agriculture and 3% of the population in the Western Cape is working in this sector", with many of them being seasonal, migrant workers. For more details on the intricacies of the demographics, employment rates, and specifics by racial group for the Western Province and Cape Town, see the full labor study[6].

A final note on the data of this study must mention that the data collected via this survey sought to log data points from various points in time. Respondents were asked for their responses in regards to definite points in time which provided a quasi-panel set of data in the end. I did my best to make sure that my translator (when applicable) and respondents understood the motivation and purpose behind the period division in the research. Therefore, the true economic trends and perceptions as indicated by the respondents are subject to a present bias.

3 Community Survey. 2007. "A Profile of the Western Cape Province". Pg 1.

4 South African Institute of Race Relations. 2007. "Fast Facts: April–May 2007, Provincial Profile, Western Cape". Pg 20.

5 South African Yearbook. 2012. "SouthAfrica.Info".

6 Visit: http://www.elsenburg.com/provide/reports/backgroundp/BP2009_1_1_%20WC%20Demographics.pdf

Land Ownership

One of the ANC's highly advocated policy areas of *restorative justice* deals with land reform and its equitable distribution. On a national scale, a very intricate system has been designed to receive land claims and attend to several forms of property reallocation. Without going into excessive detail, there are two main avenues through which a black or coloured family can receive land—redistributive or restorative. The redistributive path can grant a claimant legal rights to a government house for free, subsidized rent/mortgage, or simply access to a fair and approved lease agreement. The restorative path involves a claimant placing a request for *previously-owned land* and must be corroborated with evidence of former ownership.

The response data from the questions regarding land ownership and government housing programs varied between the five townships. In an older township such as Langa (the oldest in the country), the availability of land is already scarce in the township and the infrastructure for utility provision is not as established as newer townships. As a result, the government has been less willing to commit to large-scale house building projects in areas lacking developable land a prerequisite level of provision infrastructure to connect to the potential structures. A few respondents claimed that the government has dodged potential projects under such circumstances because the national administration primarily seeks to reallocate as much land as it can in a given timeframe—having to additionally build an infrastructure base or remove existing older units to create developable land limits the pace of land redistribution.

The majority of Langa residents continue to live in informal dwellings erected as products of their personal labor. Many respondents who are the recipients of public housing (via redistributive programs) in Langa and Khayelitsha noted that the new units are far smaller than the apartheid "matchboxes" (small four-room establishments erected in apartheid-era homelands). In addition, due to the mentioned scarcity of buildable land in the townships, these residences are commonly constructed in locations further away from jobs and other community amenities. These respondents affirmed that by no means were their families forced further away; however, had they wanted the government-provided houses, this was an offer they could not pass on.

In Khayelitsha, respondents residing in other newly established communities protested about the quality of building materials and decline in the quality of basic municipal services at these further locations. However, in some ways Khayelitsha may be an exception considering it is the second largest township in the country and the largest in the Western Province with more than 5 million inhabitants; therefore, it presents a demanding developmental challenge.

The largely market-based foundations (willing seller—willing buyer, used to determine prices and availability) of the government's land redistribution programs permitted the supply of affordable land to become available predominantly in the periphery of urban centers. Somewhat contrasted to these complaints, some residents of the Gugulethu Township reported a different housing-related issue where new houses are being priced outside of an affordable range. The most extreme survey response account placed the monthly rent at 7,500 ZAR/month (1USD = 8.7 South African Rand). In a separate study, researcher Stephen Gelb, using prices from the year 2000 and a standard basket of goods, calculated an estimated regional poverty line around an income of 322 ZAR/month; therefore placing 44% of the Western Province's population under the poverty line. He asserts that the market-based pricing system has left many families far from being able to afford such an extreme range of government-constructed housing.[7] Despite the likely change from the peak rents of the year 2000 and the surveyed rent levels, an evident disconnect between the real purchasing power and market mechanisms for the land redistribution persists.

Among the survey respondents, some had chosen to enter the longer restorative process. A husband and wife in particular from Nyanga were very eager to express their opinion during response discussions. The couple posed this question—"what positive social benefit does a land transfer give you beyond a house?" They contended that it does very little to restore a previous livelihood. To many, a basic land transfer does little to directly empower the recipient's ability to generate income. For instance, if the land owners were formerly farmers, they no longer own equipment, seeds, and other materials needed to maintain an agricultural livelihood.

Continuing with restorative process respondents, I interviewed some who had already settled a submitted claim, received their land, and had since sold the property to access a much needed source of equity. These respondents subsequently moved back into their townships and reestablished a permanent home in the informal settlement areas. Other frustrated respondents were also seeking the restorative path yet were ensnared in other bureaucratic dilemmas with little optimism of expedition. A well-cited example of such is the District 6 suburb which was evicted during the 1970's for its rich multi-cultural social order and defiance of apartheid-era restrictions. Long seen as a martyr during the revolutions, it is now victim to inter-governmental fragmentation and contradictions among reform policies. A collection of its former residents, now living in Khayelitsha, explained how dates for the construction of affordable housing have come and gone without a clear indication of how the lack of state funding will be resolved. To this day, the entire area remains uninhabited and a much touted, prime real estate location. Many former residents fear that it will soon become a site for corporate construction.

From the perspective of the government, land reform was predicted early on to be an economic panacea. Conceptually it would *encourage individual enterprise through secure property ownership*; however these aims soon split means of implementation as limited entrepreneurial assistance accompanied this property ownership.[8] The same husband and wife farmers from Nyanga shared a personal account of their community's redevelopment that powerfully illustrates how property rights have actually led to insecurity for many. The wife's brother was initially seeking a redistributed property as a farmer when the government told him that a collective of farmers needed to present themselves as applicants to in due course receive a shared piece of agricultural land (the policy was particular to the Nyanga township). After receiving approval and property from the myriad of agricultural authority bodies, the farmers faced a sequence of difficulties which were largely grounded in trust issues. The communal ownership/management of the land made it difficult to delegate responsibilities and this was further complicated by the lack of basic financial supports by which to sustain their practices. After surviving the initial growing season, the collective experienced a drain of labor as many farmers migrated back to the city to pursue more profitable jobs. The perceived panacea of property rights had failed here and even exacerbated the insecurity of the now unemployed and newly migrant workers.

7 "Macroeconomic Policy and Development" Stephen Gelb, Pages 1-2.

8 "Doing Business with a Development Ethic—'New Look' Land Redistribution in South Africa" Deborah James, Pages 4-5.

Quality of Housing

The responses from the questions concerning the quality of residences and access to basic utilities hosted a large range of perspectives. On the surface, tabulations revealed that regardless of the township of residence, respondents were divided on whether they viewed a current residence as permanent or temporary.

A recent socio-economic survey in South Africa, administered by Future Fact, recorded that almost 40% of upper and upper middle class black adults in the Cape Town region live in township communities. The responses from my survey revealed that almost 75% of those who identified with that same socio-economic class lived there by choice; moreover, preference. Among this cohort, respondents expressed little desire to move to the existing suburban areas and believed that the townships would eventually evolve into suburbs. The majority of township residents perceive the suburbs as unwelcoming areas in contrast to their current informal yet tightly knit communities.

When it comes to making home improvements, most residents are relegated to utilize discarded or cheaply priced building materials. Many residents protested about a lack of access to government credit for home improvement purposes; moreover, were equally frustrated by the fact that credit cannot be accessed without the security of land tenure/property title. The alternative finance options include socially-minded capital lending organizations, which are very limited in geographic scope, or resorting to a local money lender who may charge and interest rate upwards of 100%.

The survey questions regarding basic utilities specifically queried about the access to water and electricity. As a whole, the respondents noted that the infrastructure provision (public and private) had drastically expanded in the 2-3 years following the end of apartheid. My separate research found that the government recognized early on that it could only provide these services to about 60% of the population at market prices, subsidized, or no-cost to lower-income households. Thus the sphere for private provision was encouraged. In Cape Town, private providers only make up about a quarter of the market, whereas nationally the number is almost half. Overall, the respondents did not mention a disparity between the quality of public/private provision, suggesting that from both sources the water was acceptably clean and the electricity reliable. A few residents mentioned the rolling blackouts that the country has experienced in the past few years, yet these deficiencies were not something endemic to either public or private operations, but resulted from a net lack of energy generation. Eskom the largest electricity provider in South Africa was prevented from investing in new generation capacity in the 1990's as part of a program to encourage deregulation and decentralization in the industry; however, the lack of resurgent competition resulted in a shortage of electricity in the early and mid-2000's.

Residents who were the minority party recipients of private water and electricity in Cape Town were sure to complain about rising costs in the previous 15 years, and as a result have been strained to live without one or the other for short periods. In Cape Town electricity bills are prepaid and the amount of electricity is predetermined. These service agreements necessitate energy budgeting behaviors and especially during periods of peak demand. Oftentimes at an electric distribution node, or residential location paying and receiving electricity, the owners will jerry-rig multiple wires to the main pole for multiple households. Sharing electricity often accelerates the consumption of the prepaid electricity amount. Furthermore, these extra wires aren't always attached legally or knowingly by the homeowner.

Many experts are critical of the government's decision to allow private providers into the market of public provision. Thabo Mbeki stood by his platform maintaining that the state will take reasonable legislative measures to ensure the fair apportionment and pricing of these utilities. Among others in the discussion, writer Patrick Bond argues the market driven approach that claims to be working to improving life for the poor appears to be doing something very different. The South African government continues to approve large corporate projects, damn projects, and mining contracts, all of which are highly reliant on water and power sources. The Coega smelter plant run by Rio Tinto, the Lesotho Highlands Water Project, conventional nuclear plants, expensive airports, and a cross-country fast rail network are common examples that exemplify a post-apartheid failure to focus on providing benefits to the majority of the population. These large projects overwhelmingly benefited corporations and wealthy private individuals. As a result, the residential recipients of private water and electricity are in direct competition with larger infrastructure projects as demand increases for basic utilities.[9]

Educational Opportunities

Education remains an area of major weakness in the holistic development of South Africa. Bill Freund remarks that in aiming to overcome the deficiency in human capital as a legacy of apartheid, the government has quite a task ahead of itself: “in the RDP document of 1994 we will find that education occupies less than a page, less space than the subject of sport. Moreover there is a crude assumption that what is at stake is simply equalizing the educational budget, not the standards.”[10] In order to reveal the changes in economic opportunity, as afforded through reformed education, I realized I could not interview residents of the townships who had been educated under the prior Bantu system during apartheid.

On two occasions, I took the opportunity to travel to primary schools in Khayelitsha and Gugulethu to interview current teachers. When asked their thoughts on the present education model, both teachers mentioned funding and resources as crucial impediments to the desired operations of the system. The teacher from Khayelitsha mentioned that although all public schools receive equal state subsidies, the more successful schools rely overwhelmingly on private subsidization by parents. Despite being “public” in their inception, individual schools and districts can accept private donations from citizens without restrictions or limits. Well-subsidized schools are predominately located in the more affluent areas of Cape Town, and not townships such as hers. In addition, the teacher from the school in Gugulethu remarked that state spending per pupil equalized around the year 2002. Freund also cites how large proportions of educational spending are not devoted to classroom resources or other educational programs as one may suspect, but 90% of the budget is earmarked for salaries[11].

The teachers and knowledgeable respondents articulated the struggles of the current system to overcome the legacy of the Bantu system. In the Bantu system, blacks were not taught math or science because the government did not deem it necessary for future employment, and to this day schools struggle to adequately staff their math and science classes with qualified teachers. The scarcity of knowledgeable math and science instructors is a complicated predicament considering how teachers are required to lecture students in subjects which they themselves possess limited understanding. One teacher remarked that she still sees the painful inequalities of the past system only now in a form dubiously less stark as a result of poor planning.

9 “Development Dilemmas of Mega-Project Electricity and Water Consumption” Patrick Bond and Molefi Mafereka ka Ndlovu, Pages 1-2, 17-18.

10 “Development Dilemmas in Post-Apartheid South Africa” Bill Freund, Pages 15-16.

11 Ibid. Pages 13-14.

As for the school sites, both teachers affirmed that their buildings had sufficient teaching space to accommodate students and a satisfactory amount of textbooks. Though they did admit they were lucky because many schools in the area did not have enough space, adequate utilities, or even a bare minimum number of textbooks. The lack of teaching resources and qualified teachers may undermine the prospects of a qualified education for many students. Parents and adult respondents agreed that without a strong educational foundation at the primary level there are few opportunities thereafter for higher learning.

During the course of the trip I had the unique opportunity to interview and work with graduates of the township secondary school system (post-apartheid). These students entered the post-apartheid school system during its formative years. As a whole, these responses did not attribute a favorable perception of the educational planning bodies as a major player in the improved construction of primary level education. Many student respondents cited lack of after school and individually-geared tutoring programs. One student recalled a “if you don't understand, you fail” mentality in his school. Another remarked that “a week would pass sometimes without anything being taught, if the teacher was even present.” The recurrent theme of teacher qualifications once again raised some flags.

Overall, the consensus among recent graduates was that their schools neither provided adequate learning resources nor qualified teachers through which to obtain an empowering education. Respondents enrolled in higher education had greater familiarity with proposed educational reforms by the government. In 2009, the government outlined some worthwhile goals and important targets to achieve by 2014 in the most recent electoral mandate; however, the students complained the mandate has outlined few explicit means of implementation or responsible planning bodies. Specifically the mandate pushes for increased investment and access to quality education with mentions of performance targets, the aims to increase opportunities in secondary/post-secondary education, and provide administrative support for teachers but stops planning there[12]. They fear that the policy has no outlines means or clout through which to create worthwhile opportunities on a comprehensive scale.

While collecting data in the townships, the responses from residents who had experienced only the prior Bantu education system provided a few yet notable insights. In their educational experiences, attendance for blacks was not compulsory past the age of 15 and a majority admitted to not getting past the 7th or 8th grades. Even in the years leading up to the mandated enrollment-through-date, the rules for attendance were loosely enforced; whereas, whites and coloureds were nearly forced to enroll through to their “matric” (short for matriculation) exams at ages 18 and older. Many of these less fortunate parents were satisfied to see that the government had since changed the requirements. Simultaneously, some parents admitted to being in no position to judge the real quality and caliber of their children's work because they are unable to help with school assignments and determine the quality of their children's work. Therefore, from the parents' perspective, any basic improvement in the educational system for blacks was

12 Minister in the Presidency. 2009. “Together Doing More and Better Medium Term Strategic Framework: A Framework to Guide Government's Programme in the Electoral Mandate Period (2009-2014)”.

a net benefit for their children. Throughout the trip to South Africa, the topic of education reached an almost revered status among all ages because it is seen as a simple yet dependable empowerment to escape the snares of poverty. As a result, many families are more than willing to sacrifice the labor or otherwise income their children would contribute to the household by not attending school.

Employment Prospects

After the end of apartheid, the government realized the pressing need to address the gap between the first and second economies, as they are commonly referred to. The highly unequal economy of South Africa suffers from the spatial and services divisions of the apartheid era and perpetuates the economic marginalization of those informally partaking in economic activity. Urban integration and physical desegregation became the two main agendas that would accompany attempts to reconcile the primary and informal economies. The stark division between these systems places them at opposite ends of the spectrum, with industrial wealth and opportunity at one and disadvantage and poverty at the other. Up until the present, migrant labor has been the oldest connection between the two economic subsystems. In 1994, the government stated it would set out to change the way individuals conceived their relationship to the wider economy and in effect, create a new type of citizen.

The vast majority of the township respondents expressed that their prospects for employment, or simply sources of income, are seasonal at best. Most do not rely on education credentials or other certifications in order to qualify themselves for the myriad of informal positions. In the informal economy, if you are willing and able, have basic experience, or better yet know someone then you can be qualified for a position. One man, a self-made carpenter, expressed that there is a lot of competition in particular for manual labor jobs in the second economy and described to me a basic day of searching for work: "a man (foreman) will come by to the pick-up point with his truck and call to the dozens of men waiting for such offers- 'I need five today'- and the first five men that can hop on the truck, win work for the day."

Some residents I talked with across the townships were more entrepreneurial and had set up car washes, barber shops, small food vending services, and most commonly the *spaza* shop—a basic corner store. While interviewing these entrepreneurs, I did not want to pry and inquire about their profitability; however based on foot traffic, my impression was that many seemed to be simply sustaining their operations and no more. Albeit part of the vast informal economy, the owners of these small micro-enterprises told me there are very few resources made available from financial institutions: including basic account services, access to commercial credit, advising/consulting services, or even information about enterprise development. On the topic of accessing credit, all of the small business owners told me that credit from the government is inaccessible without a property title, thus private and charity sources can become the only alternatives for township residents to receive the loan principal they require.

A surprising amount of respondents, from Khayelitsha and Imizamo Yethu in particular, told me that they have been seasonal farmers for the majority of the past 15 years. Each February/March through June, these heads of households would travel to farm barley, maize, or work on the vineyards where they earned the majority of their annual income. Furthermore, while they lived away from their homes, most did not stay with extended family but had to expend further and build temporary dwellings. Seasonal migrant farmers remain significant contributors to the Cape Town economy.

Survey responses revealed that employment opportunities are more difficult to come by in the confines of the township communities. Most admitted that by travelling into Cape Town proper, they could be much more successful at finding work, though still within the informal economy. Here there are more opportunities for general laborers, vendors, and hourly-paid positions working in restaurants and other assorted commercial stalls. Much of these jobs depend on the burgeoning tourism industry in Cape Town. One forward-looking respondent noted that if employers were to erect commercial enterprises (such as supermarkets and retail outlets) in the townships, they could tap into a vast labor pool and underserved customer base. Yet, without such local opportunities, many continue to seek income in more prosperous areas or are relegated to be dependent on one another at home to get by financially.

According to published figures, the current rate of unemployment in Khayelitsha hovers just below 50% and of course varies internally within the hundreds of communities, all totaling in a population of 5 million. This rate at about twice the national rate exhibits proof of very uneven economic development. Such a staggering situation has prompted the involvement of various humanitarian programs and socially-motivated businesses to provide training and sources of employment. Domestic and international NGO's and emergent social entrepreneurs have taken up various fronts in education, skills training, personal development, and employment creation in the battle against unemployment. A prime example, Silulo Ulutho Technologies in Khayelitsha refurbishes computers, provides training, internet access and basic IT services in the township. Another enterprise, The Clothing Bank trainings single mothers how to make clothing garments and then teaches them the basics of running their own retail operations. Many respondents are fortunate enough to attribute their accomplishments to the endeavors of such well-intentioned organizations. Though the efforts of these outreach programs are initially confined to a few individuals, the development of personal skills and confidence is soon transferred to the family, and eventually the community. The same respondents repeatedly expressed their desires to succeed and become examples to others within the community.

Across the economic sectors, the structural unemployment is debilitating. In 1996, the government instituted the GEAR (Growth, Employment and Redistribution) strategy. Most experts would contend that this commitment to open markets, FDI, and privatization did not make significant inroads on the national employment issue; moreover, the accounts of my respondents would corroborate this conclusion. Most township residents said they never even felt the intended impacts of the strategy (employment creation); assuming they had heard of the government's intentions specific to GEAR. Other respondents noted that during its period of implementation (1996-2001) they did not receive any of the government's attempts at affording greater skills development or training programs. Wealth remained just as unevenly distributed, FDI commitments focused on capital-intensive production, the targeted 6% annual GDP growth rates and the 400,000 annual jobs added were far from achieved.[13] In the views of the respondents, the government shifted its focus of aggressively tackling social concerns to relying on orthodox macroeconomic remedies.

In my interviews I found that the demand among respondents for employment creation came second only to the investment in education. Additionally, many respondents told me that in *their* experience, fellow citizens complain of unemployment and crime, *not* housing- which is not seen

13 "Macroeconomic Policy and Development" Stephen Gelb, Pages 21-22.

as a major impediment to economic independence. The government however has focused most of its efforts toward property redistribution. Years after the implementation of the GEAR strategy, the public was once again disappointed by the ASGISA strategy in 2005.

The ASGISA programs targeted to bridge the two economies by specifically focusing on the labor-intensive tourism and business process outsourcing industries. The government failed to see that growth in the first economy widens the overall gap between the two, and growth focusing on social improvements in the second impedes on the growth of the primary sectors. Two respondents, having lost their jobs in the primary economy in early 2006 noted that there was in fact a growth in demand for high-skilled workers (of which there is limited supply). On the other hand, the two men were victims to growing levels of unemployment among lower-skilled workers. Additional respondents without a current formal position reassured me that very low-skilled jobs are out there, but they are extremely low in pay. A few respondents went as far as to claim they have less purchasing power now than during the apartheid era. Rising prices among basic goods and food items was a recurring topic of concern among respondents when asked about their income and employment security. According to the latest census, in 2005 "government grants are the main source of income among the poorest 50% of the population, not salaries or other sources from the informal sector."[14] Yet on a positive note, based on additional responses, it is evident that the ASGISA programs did help bolster the burgeoning tourism industry.

The government has outlined numerous individual strategies and others that were components of larger policies such as ASGISA, devoted to skills development and training programs. Both economic policy experts and my survey respondents would agree that these attempts have fallen far short of their desired impacts. Many township residents referred to the empty promises of skills training as "completely ineffective" or even "failures". Interestingly the same people knew of smaller, more successful development programs in their communities, but these are not government affiliated (such as the Earlier mentioned Silulo Ulutho Technologies and The Clothing Bank social enterprises)The government programs are cited as over-ambitious and poorly-implemented by the general township citizenry. For example, residents assert that asset-building and advising services are of no use to unemployed individuals. A final tenet of governmental skills development programs aimed at uplifting small to medium, black-owned enterprises. Frustrated respondents wanted to know how they could become entrepreneurs without reliable access to credit. Soon the administration realized the shortage of black entrepreneurs contrasted to their original estimates.

In a conversation with two college students, they mentioned that some BBBEE (Broad-Based Black Economic Empowerment) initiatives which seek to employ blacks in higher corporate positions are in contradiction with the government's advertised, primary aim to inculcate a greater entrepreneurial environment for individual entrepreneurs. For these students, it appears that there are programs that openly encourage both paths, yet only resources to facilitate the BBBEE initiatives and equity ownership in existing corporations. The program has also been criticized for only narrowly helping select African individuals. Finally, other students additionally expressed some concerns about their future job prospects which are based on the experiences of recent alumnae who have struggled to find employment even as college graduates. Therefore, their experiences have provided examples of the limited benefits to

14 "Development Dilemmas in Post-Apartheid South Africa" Bill Freund, Page 11.

acquiring a refined skills training in the current economy. Combined with the insights of the two recently laid-off respondents that cited the demand for skilled workers, it is evident that there is a mismatch between the pools of qualified workers, employers, and even the government programs that are designed to solve this schism.

Impacts of Crime

Transitioning into the late 1990's the government was faced with the undertaking of quelling a vibrant protest culture all the while pursuing urban integration at the expense of racial desegregation. The administration sought to provide strategic locations within the city of Cape Town to make employment opportunities more equally available and in the process integrate racially divided and excluded groups. The urgency for effective solutions to create a new mentality among the citizenry still increases daily with the high prevalence of crime. Crime was noted by a majority of my respondents to be one of the top three impediments currently facing the country, and most put the blame on the government. They feel that the police have not been given the resources and proper judicial support processes to guarantee effective enforcement. Furthermore that this lack of support has led to a deterioration in the conviction among enforcement members. Some respondents went as far as to call them incompetent or poorly trained. Furthermore, many had hinted at growing corruption between the police officers and local citizens, though mostly facilitating non-violent crimes such as property crimes and robberies. In other incidents, when the police are called into the townships they are known to be slow, unfamiliar with navigating the streets, and/or simply have no ability to find an offender in the myriad of informal roads and dwellings.

By reason of this ineffectiveness, several respondents admitted that many people do not even "waste their time" calling in or reporting a crime. This is worrisome for reporting purposes because in 2009 South Africa already had the highest rate of rape in the world, second highest of murder, and tenth highest rate of robbery. Finally, with around two million reported crimes in 2009, hardly half resulted in a charge and only 10-15% in conviction.[15]

The wanton violence such as a fatal shooting that may accompany the theft of personal phone, according to some respondents, is perpetuated by the trigger happy police force. Yet one cannot attribute the excessive crime rates to the police force and the legacy of the protest culture from the apartheid era alone. Some respondents have suggested that another factor is a growing outward disregard toward laws altogether. On the other hand, some crimes are committed without even a consideration of the laws, thus not quite *acts of defiance*. For example, some willing respondents explained to me the myth telling that "one who is infected with HIV/AIDS can cure himself by having sex with a virgin"—a myth that has unnecessarily perpetuated the highest incidence of rape in the world, and not a consequence of outright defiance of the laws condemning rape. Also independent of the consideration for laws, high usage rates of alcohol and other cheap drugs can influence a person's ability to think clearly or simply act in a non-violent manner. Of the respondents willing to comment on the topic, all admitted to knowing multiple people (family/community) that are currently addicted to alcohol, "dagga" or mandrax (a sleeping pill), or other common illegal/prescription drugs. Furthermore, most blamed these dependencies on the ease of access to these drugs and their usage in combination with other drugs (also termed poly-substance abuse), and did not blame the addicted peoples personally. Of course, drugs are not the prime motivator of crime either, yet considering how black

15 "Crime in South Africa—it won't go away", The Economist. Print- 1 October, 2009.

market networks operate within and rely upon each other there likely is a perpetuated relationship.

Regardless of the cause, many respondents who are parents are concerned about what types of messages these crimes are communicating to children and youths. Fearing that a normalization of violence in their daily lives will lead their children to continue the cycle, parents do not know how to escape the "trap". Almost all people admitted to being fearful for their personal safety in *their own* neighborhood, particularly at night. Among my younger respondents, the preferred solution to a possible crime trap is an increased focus on youth development and community based programs. Research has also shown that education of any kind greatly reduces an individual's propensity to commit a crime; for example, being educated about the truths HIV/AIDS would result in less rape. On a basic level, youth development programs will keep potential criminals occupied. Community respondents have related the high levels of crime to high levels of unemployment and general idleness.

Respondents have told me that the government has focused less on education than it has on trying to incorporate the working class into city life. Nevertheless as mentioned in the employment opportunities analysis, the government has not been successful in empowering the large numbers of new urban dwellers with income-earning opportunities. Most respondents would agree that Cape Town's crime is largely the result of growing frustrations rooted in the lack of progress made towards reducing levels of inequality. Therefore, any program created to reduce levels of criminal acts must first address the initial sources of discontent and reasons for the crimes.

Conclusion

During the last fifteen years, South Africa has indeed made great strides in the attempt to reverse the legacies of apartheid. No country in the history of the modern world has been faced with such a daunting task of reorganizing its economy and redefining the understanding of social citizenship. Despite having a strong momentum in its earlier years, the ANC nonetheless has been criticized for failing to effectively implement many of its proposed policies. The regime is fast-approaching a critical time whereby it can soon be judged a success or disappointment.

In summation of the survey results, the general consensus among respondents was that economic progress had been made in the previous 15 years; however the availability of new opportunities was not nearly as widespread as hoped. The pace of socioeconomic reform did not meet its expectations. Contrasted with the economic growth of financial centers and downtown areas of Cape Town, the distributions of the benefits are decidedly uneven. In effect, the initial post-revolution enthusiasms in hopes of prosperity are waning. Given the scope of improvements that have been demanded, one cannot expect an overnight delivery of all the provisioned reforms; however, after a decade and a half, all too many respondents still feel they received the short end of the deal. Substantial growth in the informal economy alone will not carry all the people South Africa out of poverty.

It is helpful to look at revolutionary transformations as seeking to instate a hierarchy of rights: political, economic, and then social. South Africa has achieved the base political rights considering the ANC is the controlling political party and has passed possibly the most progressive constitution in the world. However, due to a lack of significant competition in the political arena, many less than questionable actions have been taken by politicians. Even the incumbent president has recently faced allegations of rape. This allows us to raise the question, can bureaucracies strangle democratic revolutions?

On the other hand, the economy is a system in its own right which is influenced by foreign actors in addition to the administration's fiscal and reform policies. The creation of well-intentioned programs and the hopeful reliance on the free market cannot guarantee the restorative economic justice which the country's almost 90% black and coloured population has demanded. The dependency on the domestic primary economy and existence of powerful transnational corporations in South Africa also may have inhibited efficient restructuring policies from thriving.

Only after the political and economic rights are provided to the citizens of South Africa can they begin to embody social rights and a new sense of national identity—shaped by their successes and the opportunities available them. The ultimate triumph would be a national identity that no longer dwells on racial divisions as a determinant of class. This last part of the hierarchy is undoubtedly the most difficult to attain; however, understanding this, many South Africans are simply frustrated with the lack of economic progress since 1994 and some have dubbed the recent era as an "informal or de-legitimized apartheid". Many wonder if they have been misguided in their pursuit of a better future. The people need a goal to work towards so the question remains—what does the future look like?

This survey project granted me an intimate glimpse into the everyday concerns and perspectives of the people in Cape Town's township settlements. I often wondered why the majority of the responses had a critical overtone, but soon realized that after 15 years and still living in a township, they have reason to be frustrated. The facts and figures of South Africa at the national level rank it among the most *developed* in the developing world. Meanwhile, the country has one of the three highest measures of wealth inequality on the planet. Thus, future economic reform initiatives necessitate the inclusion of the perspective of these township residents. The ANC's dedication to ending the legacies of apartheid will need to embrace public opinion and review alternatives to generate innovative policy solutions.

Appendix A

PART A

1. Could you explain the status regarding the ownership of the land you live on? And how if so, has this changed each 5/10/15 years ago?
    a. Do you have a land title for your property?
        i. Y: How/When did you receive it? (Free/$/Gov't)
            1. Did you appeal for it?
        ii. N: Why don't you have one?
            1. Are you trying to get it?
    b. Did you used to own land elsewhere?
        i. Why are you here now?
2. What do you know about government land reform now/5/10/15 years ago?
    a. How have they affected you?
    b. What about others in your community?

PART B

3. How would you describe the type of dwelling you live in and changes to its quality over the past 5/10/15 years?
    a. How many people live in your household, including yourself? 5/10/15 years ago?
    b. What have you done in 5/10/15 years to improve the quality of the residence?
    c. What do you know of <u>non-/gov</u>ernment housing grant programs?
4. How would you describe your access to electricity/clean water?
    a. Household/local access?
        i. For how long have you had access?
        ii. Public/private provision?
    b. How accessible is CLEAN water?
    c. How has this changed over 5, 10, 15 years?

PART C

5. How would you describe your educational experience?
    a. Y: How many years/what level of schooling?
    b. N: Do you have future plans for such?
        i. Do you know of opportunities available to you?
    c. How about other adults in your household?
        i. Children?
6. And the prospects for your children?
    a. Are there schools for them to enroll in?
    b. Will they be required to help support the household?

PART D

7. Can you briefly describe your current employment situation (all income sources)?

Appendix A (cont.)

    a. How does this compare to 5/10/15 years ago?
    b. How many people in your household have a regular source of income?
    c. How would you describe regular food security?
        i. How often do you worry about having enough food?
8. Can you describe recent opportunities for employment in the community?
    a. Full-time employment?
        i. What benefits do people receive from the job?
    b. Can you tell me what you know about unions?
        i. What positions do/did they advocate?
    c. Are business licenses and credit easier to obtain?
    d. Can you easily access all the materials you need to operate?
    e. Do current economic conditions encourage you to continue informal operations?
        i. Has this encouragement or discouragement been increasing or decreasing within the community over 5, 10, 15 years?

Ask only Business Owners

9. Does the government provide assistance and resources for informal sector businesses?
    a. What types?
    b. Financial assistance?
        i. In what form?
    c. How has this assistance changed over 5, 10, 15 years? (availability/ease of access)

Part F

10. How have levels of crime impacted your community?

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Labor Regulations and the Growth of the United States versus Europe

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Abstract

The United States and Europe have made up a large portion of the world's GDP for the past one hundred years. The dramatic success of these Western economies, especially relative to the rest of the world, has led to much research into what factors contribute to growth. While both regions have been highly successful, U.S. growth has dwarfed European growth in recent years. One major difference between the US and Europe, which could explain a divergence in their growth, is labor regulation. Europe is characterized by rigid labor regulations, while the United States has more relaxed labor regulations. To this end, I use the tool of growth accounting and Solow residuals to explore how labor regulations have affected growth. Specifically, I examine three distinct periods: 1950-1973, 1973-1995, and 1995-2004, time periods that reflect major shifts in economic performance. I further analyze the impact of the ICT sector on growth. My results indicate that rigid labor regulations benefit post-war economies, such as Europe in the aftermath of World War II, and that more relaxed labor regulations benefit innovation economies, such as the U.S., which benefitted from a boom in the ICT sector in the 21st century.

1. Introduction

For the better part of the last century, the United States and Europe have dominated the world economy. In fact, according to the International Monetary Fund, the European Union and United States made up 49.12% of world GDP in 2010. Researchers attribute the success of these Western powerhouses to a variety of factors, including political and technological factors such as democracy and a high degree of innovation (Damiani and Pompei, 2010). The obvious economic success of these two economic giants is rooted in a common origin in Europe, similar cultural values, and similar political structures. It is evident by the sheer magnitude of the U.S. and European contribution to world GDP that these roots and the resulting Western institutions have produced good economic systems. Given the similarities of Europe and the U.S. one would also expect these countries to grow in parallel. In recent years, however, U.S. GDP growth has significantly trumped European growth. The divergence of these two Western economies has led to a flurry of studies aimed at investigating the causes for this phenomenon.

Researchers attribute the GDP growth differential to income taxation levels, labor regulations, and changing consumer preferences, in addition to standard labor and capital factors. In this paper, I specifically explore the effects of labor regulations on growth in the United States versus the European Union. The main strategy I employ to analyze growth differentials is the Solow growth model.

To this end, I take on a rigorous empirical exercise to better understand the causal effects of labor regulations on growth. I use the tool of "growth accounting" to calculate Solow residuals for each country. The Solow residuals measure the contribution from factors not explicitly stated in the designated production function. Such undetermined growth factors are believed by economists to reflect technological growth, often called Total Factor Productivity (TFP) or equivalently multifactor productivity. Research links high TFP growth to labor productivity. Assuming TFP growth has a large effect on growth, high labor productivity can then causally be related to increased growth. To better understand growth patterns then it becomes essential to understand the factors that play into labor productivity.

My paper focuses on attributing specific labor regulations to labor productivity and as a result to growth. To analyze labor regulation in a comprehensive fashion, my strategy is three-fold. First, I explain the 1965-1995 TFP trends using economic intuition and historical labor force data and trends. Then I expand the analysis to include more recent data up to the 21st century and segment my analysis into three time periods, so as to put my TFP 1965-1990 results in context. Lastly, I delve into U.S. and European growth trends by specific sector, notably the information's and communications technology sector (ICT). This three-pronged approach better explains the transition to higher US versus European labor productivity and overall growth in the context of differing labor regulations.

The organization of the paper consists of eight sections. Section 2 provides a historical outline, which is broken down into three distinct periods. In the same section, I include economic reasoning to provide for an interpretation of historical events in an economic context. Section 3 explores the general economic effects of specific labor regulations on growth. In Section 3, I further investigate labor regulations in the context of the three distinct time periods. Section 4 incorporates the information's and communications technology (ICT) component of the analysis. In Section 5, I present the data followed by the empirical strategies in Section 6. Section 7 includes my results. Lastly, Section 8 concludes and summarizes my results relative with respect to the literature on labor regulations and growth.

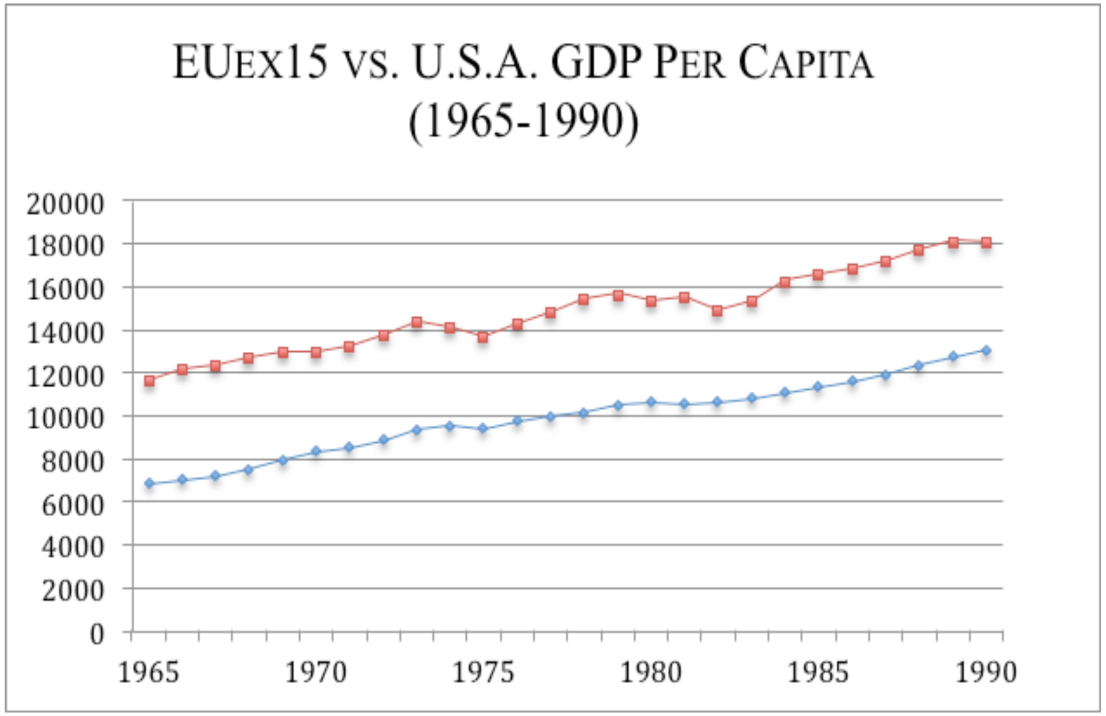
2. Historical and Economic Outline

U.S. GDP has been consistently greater than any other county in the world since 1965. In 1965 U.S. real GDP per capita hovered around $12,000 (in US dollars) relative to an also impressive $6,000 (in US dollars) real GDP per capita level for Europe. In comparison, world GDP per capita stood at $2,660, based on data from 126 countries which reported GDP in the 5.6 Penn World Tables. Note that the numbers in this paper are all converted to US dollars and expressed in terms of 1985 dollars in order to effectively compare them across countries and over time. As evidenced by these numbers, the GDP per capita in Europe and the U.S. was remarkable high by world standards. Notably, the growth in GDP for Europe and the U.S. grew in parallel until 1990, reaching a real GDP per capita level of about 18,000 in the U.S versus about 12,000 in Europe in 1990. The EUEX15 vs U.S.A. GDP Per Capita Graph, constructed from PWT data, depicts these results.

The time period between 1965-1990, however is limited in scope, and doesn't reflect recent GDP trends, where U.S. GDP levels *and* growth have exceeded their European counterparts. The limited 1965-1990 time period further groups our analysis in a way that doesn't effectively account for changing economic times and changing labor regulations.

In order to more effectively evaluate European and US growth patterns and evolving labor productivities, I next analyze three distinct periods: 1950-1973, 1973-1995, and 1995-2004. These time periods reflect major shifts in economic performance, as argued by Van Ark et al. (2008). Thus, I can more effectively identify shifts in labor regulations as well as analyze the recent post-1995 divergence in U.S. and European labor productivity.

Table 1.0 is adapted from Van Ark (2008) and recalibrated to the most pertinent variables to labor regulation. The table



compares the relative labor productivity growths of the United States versus the European Union by time period. In the table the variables included are GDP, GDP per capita, and GDP per hour worked. In this table, the final period extends from 1995-2006, which can be used as an indicator for trends for a negligibly shorter time period from 1995-2004, which I analyze due to data availability.

Following the results in the table, the three time periods indeed saw dramatic economic changes. Next, I investigate the historical and economic background of these different periods.

The first period, from 1950 to 1973, can be characterized by European economic "catch-up." This means that Europe experienced rising GDP and labor productivities relative to the US. The reasons for this "catch-up" have been extensively reviewed by the literature and can be broken down into two categories: technological innovation and new institutions (Boltho, 1982; Crafts and Toniolo, 1996; Eichengreen, 2007).

Immediately after World War II, Europe was poised for growth for two main reasons. First, Europe's legacy as an industrialized nation meant that Europe had a relatively well educated population and strong institutions in place in the aftermath of the war. Second, the highly regulated European economic model is especially suitable for "catch-up" post-war growth. I explore the productivity effects of labor regulations in greater depth in section 3.1 of this paper, which pertains to specific labor regulations in the period 1950-1973.

The second period, from 1973-1995, came about in the 1970's and 1980's when labor markets tightened and wage demands increased. Between 1973-1995 both the U.S. and Europe experienced a productivity slowdown. Europe's productivity decline, however, was particularly dramatic, as evidenced by Baily and Kirkegaard (2004).

In the context of the third time period, between 1995-2006, the labor productivity differential becomes clear as Europe's productivity plummeted further relative to the United States. Between 1995-2006, Europe's GDP per hour worked fell sharply from 1.5% to 2.4% (Van Ark et al., 2008b). This decline becomes more drastic when compared to growth in period of 5.3%. Relative to the US the productivity slowdown is even more pronounced. Where Europe's GDP per hour worked was double the US in the second time period, post-1995 the EU-15's GDP per hour worked comprised about two-thirds of the U.S. GDP per hour worked.

In conclusion, when I break down the period from 1960-1995 into distinct time periods and add a few additional variables, it is clear that in terms of labor productivity the United States and Europe diverged significantly over the course of the last three decades. Thus, it is essential to next evaluate those specific labor regulations present in each time period, and their economic impact.

Table 1.0: Labor Productivity in the European Union and United States (*average annual growth in percent)*

	GDP	GDP per Capita	GDP per hour worked
1950-1973			
EU-15	5.5	4.7	5.3
US	3.9	2.4	2.5
1973-1995			
EU-15	2.0	1.7	2.4
US	2.8	1.8	1.2
1995-2006			
EU-15	2.3	2.1	1.5
US	3.2	2.2	2.3

Source: Calculations based on the Conference Board and Groningen Growth and Development Centre, Total Economy Database, January 2007, at http://www. ggdc.net/dseries/totecon.shtml.

3. Labor Regulations and Protections and Economic Implications

3.1 Broad economic implications of labor regulations

Before I explain the specific labor regulations of each of the three time periods, I first broadly define the economic implications of labor regulations. These implications can be split into two camps, one in which labor regulations lead to negative economic growth and one in which labor regulations lead to positive economic growth. These two distinct camps can then be further subdivided. In the context of growth-reducing labor regulations, I identify two major causes: lower competition and fewer work effort incentives. Growth-promoting labor regulations, on the other hand, stem from economies of scale and less asymmetric information.

3.1.1 Less Regulation, Positive Growth: Competition

Dynamic efficiency hinges on competition. Three specific competition-enhancing factors can be easily identified. First, competition allows a venue for comparing performance across firms and sectors, allowing the market to better monitor managers. Second, cost reductions generate greater profits in a competitive environment where the price elasticity of demand is high. Third, competition raises the risk of loosing market shares, inducing firms and managers to work harder in order to avoid this outcome (Nicoletti and Scarpetta, 2003). Thus, it seems a positive relationship exists between competition and innovative activity and growth, as argued by Nickell (1996), Blundell et al. (1995, 1999), and Bassanini and Ernst (2002).

Hopenhayn and Rogerson (1993) point out that labor protections obstruct competition and thus also obstruct the efficient reallocation of resources to firms with above average productivity growth. Labor protections further alter the productive allocation of resources among sectors.

Rigid labor markets additionally discourage innovation by providing incentives for cost-reduction of existing goods over adoption of riskier new goods (Saint Paul, 2002). Thus the European economy, which exhibits such labor rigidities, has increased specialization in secure goods, but appears less high tech. In terms of long run productivity, having advanced technology is the main driver of growth in the long run.

A flexible labor market, which enhances competitive pressures as well as technological innovations, thus has a positive impact on productivity.

3.1.2 Less Regulation, Positive Growth: Capital Returns and Worker Effort

Relaxed labor regulations further allow for more positive capital returns and greater worker effort. This is because the relation between returns to investments and job protections is inversely proportional: returns to investments increase as job protections decrease (Damiani and Pompei, 2008). The costs of labor protections also extend beyond returns to investment into worker incentives. The higher the job security protections, the lower the probability of layoffs and thus the lower incentive for worker's to work hard to maintain their job. Productivity declines as a result. Fewer labor regulations in the context of capital returns and worker effort then lead to more growth.

3.1.3 More Regulation, Positive Growth: Economies of Scale

Another camp argues that labor protections, while restrictive in many aspects, also exhibit growth-enhancing properties. Consider, for example, the phenomenon of economies of scale. Labor protections in the economies of scale framework would promote growth by increasing returns for investing in human capital and training workers. Also under the umbrella of productive economies of scale, labor protection policies promote long-term relationships and skill development. Labor protections can thus mimic the economic benefits of monopolies through economies of scale and provide an outlet for growth.

3.1.4 More Regulation, Positive Growth: Asymmetric Information

Labor regulations and unionization can further promote growth by helping to solve the problem of asymmetric information. For example, if a firm declares a certain state to induce more effort from its employees, its employees might react by doubting the integrity of the firm and thus they work less and produce a negative work environment (Damiani and Pompei, 2010). Labor regulations in the form of legal procedures provide against this scenario, by guaranteeing reliable information. Thus, labor regulations could give an incentive for workers to exert a productive amount of effort.

Job security further enhances employees expected future profits, by allowing workers to conclusively determine their own output and smooth their consumption and work habits. Thus workers are willing to invest more in their own skills (Freeman and Lazear, 1994). By providing information about the future, regulations can then enhance growth.

3.1.5 Conclusion

Labor regulations have various economic costs and benefits. The goal of every country should be to secure an optimal amount of labor protection such as to derive benefits from all these factors which include competition, increased returns to capital, higher levels of worker efforts, and economies of scale. The question is as follows: has Europe, which has relatively rigid labor regulations, or the U.S., which has relatively more flexible labor regulations, hit closer to the optimum.

The results of this paper indicate that in the post-war period, labor market rigidities contributed to greater economic growth in Europe, whereas in the modern era, relatively flexible labor market regulations are the driving source of labor productivity and growth, thus leading to the U.S.'s recent dominance. To this end, I next analyze labor regulations in each distinct time period.

3.2 Labor Regulations between 1950-1973

After World War II, the European economy was well positioned for imitation growth, also known as "catch-up" growth. Under such a "catch-up" growth model, large firms benefit from a high degree of protection in the goods and financial markets (Blanchard, 2004). For example, firms can form secure relationships with suppliers and offer job security to their workers as well as run much of their research and development in-house. Such a closed and semi-monopolistic economic system is conducive for imitation. Since the "catch-up" economy depends on imitation rather than innovation, the European countries were able to imitate technology and incremental innovation from the United States, the dominant economy at the time.

The "catch-up" phenomenon can be modeled by the following TFP formula developed by Nicoletti and Scarpetta:

$$\Delta \ln A_{ijt} = \delta_{ijt} \Delta \ln A_{Ljt} - \sigma_{ijt} \ln(\frac{A_t}{A_L})_{jt-1} + \varepsilon_{ijt}$$

where δ_{ijt} captures the instantaneous effect of changes in the technology gap between country i and the technology leader j and ε_{ijt} includes all other influences on TFP growth, including differences in regulation across countries and industries.

The linear relation between regulation (PMR) and rate of technology transfer in non-frontier countries is modeled as follows:

$$\sigma_{ijt} = \sigma_{lijt} + \sigma_{2ijt} PMR_{ijt-1}$$

Then, you perform a substitution manipulation to produce a specific TFP equation that can be estimated:

$$\Delta \ln A_{ijt} = \delta_{ijt} \Delta \ln A_{Ljt} - \sigma_{lijt} \ln(\frac{A_t}{A_L})_{jt-1} - \sigma_{2ijt} PMR_{ijt-1} \ln(\frac{A_t}{A_L})_{jt-1} + \varepsilon_{ijt}$$

.You then add a coefficient β, such that the equation becomes:

$$\ln TFP_{ijt} = \beta_{lj} \ln TFP_{ijt-1} + \beta_{2j} \ln TFP_{Ljt} + \beta_{3j} \ln TFP_{Ljt-1} + \omega_{ijt}$$

Rearranging the equation you obtain

$$\Delta \ln TFP_{ijt} = \Delta\beta_{2j} \ln TFP_{Ljt} -(1-\beta_{lj}) \ln TFP_{ijt-1} + \omega_{ijt}$$

where the coefficient of relative TFP growth is a function of regulations and the coefficient on TFP β_{2j} is a function of tech transfer across industries $(1-\beta_{lj})$. The error term ω_{ijt} accounts for structural features such as regulatory policies. Such a model provides a framework for thinking about the dynamics of the European economy in relation to the United States during the time period 1950-1973.

The post-war emergence of new institutions in wage bargaining further strengthened the European catch-up (Eichengreen, 2007). Such wage bargaining allowed for greater productivity and greater income per capita.

It is clear that the European economic model of rigid labor regulations was well suited immediately after the war. As time progressed forward, however, the new economy became increasingly open and foreign competition became unavoidable. Thus, innovation increasingly became essential for growth, and in turn the European model was not as well suited to the economic situation during the latter part of the 20th century and into the 21st century.

3.3 Labor Regulations between 1973-1995

The second economic period I analyze is the period between 1973-1995, which marked a transition to less productive growth across the Western economic giants, specifically Europe. There exists extensive literature on Europe's labor market institutions and how they led to less productive work. Three major arguments include higher income taxation levels in Europe (Prescott, 2004), generous unemployment benefits and high unionization (Nickell, 1997), and higher preference for leisure in Europe (Blanchard, 2004). It seems from the literature and the results of this paper that the explanation for reduced growth stems from a conglomerate of all three, though mostly from government policy and labor regulations laws.

With regards to labor market regulations in existence in the 1980's and 1990's, many European countries introduced labor market reforms and interventions to reduce the unemployment rate. According to traditional economic theory, such labor market interventions could have led to reduced growth for two reasons. First, a rise in the labor force participation rate might have lowered the real wage per worker and lowered substitution of capital for labor, thus reducing the incentive for workers to be productive (Van Ark et al., 2008). This explanation however falls short when the assumption of stagnant output growth doesn't hold, as Blanchard (2004) points out. Also, GDP hasn't slowed significantly in absolute terms, and so the labor productivity decline seems incoherent with the substitution of capital for labor argument (Van Ark et al., 2008). A second explanation for faltering European labor productivity could be a rise in the low-skilled composition of the work force as unemployment dropped. The skill level of the workforce, however, has increased on average. Thus, labor force composition and traditional capital-labor substitution don't necessarily explain the reduction in productivity. Instead, repeated growth accounting results point to the large effect of labor regulations on TFP through reduced incentives to innovate and less competition.

A recent study by Bourles and Cette (2007) shows estimates of "structural" hourly productivity for a few European countries that are 10-15 percentage points lower than the "observed" productivities specified in the tables in Van Ark et al. (2008). These measurements indicate that labor market institutions can indeed at least partially explain Europe's productivity convergence with the US in the second time period.

The phenomenon of enhanced innovation in an environment where there exist fewer labor regulations is further emboldened by the obvious contributions of ICT in the US to growth. The ICT sector a highly completive and innovative industry, which I later delve into in the context of the second and third time periods.

3.4. Labor Regulations between 1995-2006

Since the mid 1990's, the U.S.'s average annual labor productivity growth accelerated from 1.2% between 1973-1995 to 2.3% in the period 1995-2006.

The labor regulations instituted in the 1980's and 1990's are partially attributed to the TFP differentials between the U.S. and Europe in this third period.

Another common explanation for the U.S. labor takeoff is a decline in the number of hours worked relative to previous levels and relative to Europe (Van Ark, 2008). Thus, at a lower level of hours worked, each hour increased in productivity.

Finally, the most compelling argument comes back to the effect of labor regulations on innovation. In the United States, the surge in labor productivity can be causally linked to rising multifactor productivity in the information and communications technology industry (Triplett and Bosworth, 2006). Though Triplett and Bosworth focus specifically on the market economy, I perform a similar growth accounting exercise in my empirical analysis and draw the same conclusions for the economy as a whole. The effects of the ICT industry were largely felt in between 1995-2006 due to delays in both the production process as well as the adjustment of organizational practices to existing labor regulations. In the next section, I investigate the effect of ICT growth in the U.S. versus Europe.

4. Industry Specific and ICT growth Implications

To glean greater insight into the productivity disparity and the evolution of labor productivity in the U.S. versus Europe, I analyze three factors as primary sources of overall labor productivity: information's and communications technology (ICT), labor composition, and TFP. My analysis below of contributions to growth of real output in the market economy is adapted from Ark et al. (2008). Labor productivity deserves particular note, where productivity is comprised of contributions from labor composition, ICT capital per hour, Non-ICT capital per hour, and multi factor productivity.

The first thing to notice is the higher contribution of the ICT sector to growth in the United States relative to Europe. In Table 2.0, ICT capital per hour contributes .8 percentage points to labor productivity in the U.S. versus .5 percentage points in the European Union. The distribution of ICT as a factor of growth is of further note. In the U.S., ICT capital per hour contributes double that of non-ICT capital per hour, while in Europe the distribution between ICT and non-ICT as functions of labor productivity is equal. Thus, the United States economy has in recent times been

Table 2.0: Labor productivity breakdown by industry, specifically ICT *(average hourly growth rates in percent points)*

	Output contribution from			Labor productivity contribution from			
	Growth rate of output	Hours worked	Labor productivity	Labor composition	ICT capital per hour	Non-ICT capital per hour	TFP
European Union	2.2	.7	1.5	.2	.5	.5	.3
United States	3.7	.6	3.0	.3	.8	.4	1.4
Standard Deviation	1.0	.9	1.0	.1	.3	.2	1.0

driven in part by a boom in the ICT sector.

The chart demonstrates two additional important features. First, the divergence in growth correlates one for one with the differential in hours worked and labor productivity, each at about one standard deviation. Thus, growth can be linked to labor productivity. Second, the largest contribution to labor productivity comes from TFP, where a standard deviation, s = 1.0, marks significant changes in TFP growth between the US and Europe. As stated earlier, the ICT industry was a driving force in the productivity divergence of the U.S. versus Europe. Assuming that the ICT industry is inherently competitive and a hub of innovation and that the U.S.'s labor regulations are most conducive to innovation, the relatively loose labor regulations in the U.S. explain higher U.S. labor productivity growth versus European growth.

5. Data

I use the Penn World Table 5.6 (PWT 5.6) dataset to construct residuals for the period between 1960-1995 on output per worker and capital per worker. I refrain from using the 6.3 release of the Penn World Table data since it excludes the capital per worker series. Using the PWT 5.6 dataset, I construct residual measurements for a broad time period.

In order to augment my PWT residual analysis and the adapted Van Ark et al. analysis by specified time period, I obtain further data from the EU KLEMS database. A consortium of 16 research institutes across Europe constructed the EU KLEMS database in close cooperation with national statistical institutes. The EU KLEMS database is relatively new and was published in March 2007. It includes data on economic growth, productivity, employment creation and capital formation at the industry level for the years 1980-2007. I use data from the EU KLEMS database for the years 1980-2004 only, as these were the years for which there was available data for all of the countries I analyze.

To better understand the effects of labor productivity on relative output in Europe and the U.S., I specifically extract data on United States and the ten biggest European countries for which growth accounting data was available in the EU KLEMS database, referred to in this paper as "EU15ex." The European countries include Spain, France, Britain, Germany, Italy, Austria, Belgium, Denmark, Finland, and the Netherlands. I then construct residuals for these individual countries, for the EU15ex average for which growth accounting data is available (which included only the ten countries listed above), and for the United States. I construct these residuals for the time periods 1980-1995 as a proxy for the second time period analyzed in the labor regulations section of this paper, and the period 1995-2004 as a proxy for the third time period earlier analyzed. Though I don't calculate the residuals for the first period based on the EU KLEMS data, the latter two periods mark the transition to the U.S.'s dominant labor productivity growth, and so can effectively be analyzed in isolation to link TFP growth to overall growth differentials between the EU15ex and the U.S.

For consistency sake, the European data I use in the PWT 5.6 data analysis in constructing residuals is limited to those same ten European countries later used in the EU KLEMS based residual construction.

6. Empirical Strategies

In order to decipher the role that labor restrictions and regulations play on growth, I utilize growth accounting. Growth accounting is a technique used by researchers to assess the contribution of capital, labor and other immeasurable factors to Gross Domestic Product (GDP) growth. The specific methodology of growth accounting is as follows: researchers designate a production function and then weight the inputs growth rates by the input's income shares. Acemoglu (2009) designates the production function as

$$F(K, AL) = \frac{\dot{y}}{y} = g + \alpha_k \frac{k}{k}$$

where y is output per worker, k is capital per worker, uk is capital's share of output, and g is called the Solow residual. The Solow residual captures the immeasurable factors of growth not explicitly defined by the production function, such as technological growth and organizational improvements (Hulten, 2001). These factors make up A in the Acemoglu production function, also know as total factor productivity (TFP). A time series analysis of Solow residuals reveals the likely effect of technology and organizational structure on overall productivity. In the time series analysis, high TFP growth rates are correlated with a significant portion of overall growth.

In determining the effects of labor restrictions and regulations on output, we conduct a time series analyses of the European Union versus the United States, using both GDP per capita and GDP per hour worked as measures of labor productivity.

For a rigorous growth accounting analysis, the relevant data was only available for ten of the fifteen European countries, and so the complete analysis compares U.S to the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Spain and the U.K. In calculating the residual g for these countries, I use the value ak =.35 , which is consistently observed in historical data.

The comprehensive empirical approach I employ is three-fold. First, I construct residuals for the European Union for the period 1960-1995 using PWT data. I then supplement the PWT data with the EU KLEMS database which runs from 1980 to 2004 and construct residuals for two distinct time periods: 1980-1995 and the period 1995-2004. I then compare these residuals to the general trends evidenced by the 1960-1995. Thus, I draw conclusions about the patterns of TFP growth around the time of the growth divergence of the U.S. and Europe. I then link my results to supporting economic labor productivity publications, which emphasize the 1990's as a point of economic divergence. To build a more cohesive argument for the causal source of growth divergence, I also analyze growth by sector. The relative successes of sectors that are characterized by innovation provide insight to a regions' labor regulation climate and the subsequent effects on growth. Specifically, I analyze the contributions of information and communications technology (ICT) to growth in the U.S. versus Europe.

7. Results

The Solow residuals for each respective country for 1965-1990 are shown below:

The following analysis compares the total factor productivity of the United States to the European Union average, for those ten countries with growth accounting data:

In order to more effectively compare the total factor productivity of the United States versus Europe between 1965 and 1990, I will quantify the average growth of each country and then the U.S.A versus the average TFP growth per year of the EU10:

The total factor productivity empirical data present a sharp contrast to the GDP per capita data, where the U.S. has consistently accumulated far greater wealth and output than any of the big European economies individually and on average.

While, the TFP results imply that Europe fared well between 1965-1990 relative to the United States in terms of technological productivity, the GDP differentials between Europe and the U.S. are striking. Thus, it is necessary to break down the residuals by the three time periods analyzed throughout this paper. According to Van Ark, O'Mahoney, and Timmer (2008), trends in labor productivity are the prime explanation for Europe's lagging GDP.

Using the EU KLEMS database I construct the TFP's based on the whole of the Europe versus the Unites States' economies for the two latter periods:

In the period 1980-1995, the total European economy had an average TFP of .87, relative to .19 for the United States. Between 1996-2004, EU10 TFP levels dropped to .22, about one-third it's average of the previous year. At the same time, the U.S. average TFP contribution climbed to .72. Thus, empirical evidence shows that labor productivity in the United States overtook European productivity, and then some. Further, these estimate are conservative when evaluating the contribution of labor productivity to total output, since the market economy is a more accurate reflection of labor productivity. As noted by Ark, TFP levels for the market economy show an even larger spread between U.S. and Europe's TFP contributions. Between 1980 and 1995, Europe's multifactor productivity rate stood at .9 relative to .5 for the United States. In the next period, the U.S. TFP rate reached 1.4, almost a full percentage point above the European average of .5. These results imply that when U.S. and European economies diverged, TFP

	Labor productivity contribution from			
	Labor composition	ICT capital per hour	Non-ICT capital per hour	TFP
European Union	.2	.5	.5	.3
United States	.3	.8	.4	1.4
Standard Deviation	.1	.3	.2	1.0

Table 3.0: Labor productivity breakdown (*average hourly growth rates in percent points*)

and thus labor productivity played a major role in changing growth patterns. As labor productivity during these time periods was a function of labor regulations (discussed in Section 2 and Section 3) the flexible labor regulations in the U.S. had a significant contribution to over all U.S. growth.

The data generated by our ICT analysis using EU KLEMS data provides further evidence for the link between TFP, labor productivity, and labor regulations. Table 3.0, which is modified from the same table presented earlier in Section 3, shows that TFP is the main contributor to labor productivity.

In Table 3.0, we see that where the U.S. has high ICT penetration and labor productivity, and thus operates in a low labor regulation environment, it also has high growth.

8. Conclusion

The phenomenon of growth is a black box: there is no known magic formula for sustainable growth. The best way to then determine the sources of growth is to observe those countries that have grown and compare them empirically to countries that haven't. The United States and Europe are a natural comparison, since they are relatively similar. The U.S. and Europe share similar cultural values, albeit Europeans might appreciate leisure more (Blanchard, 2004), as well as similar political structures. One can empirically pin point the cause of the countries' growth divergence by analyzing where the countries fundamentally differ. One such stark difference between the U.S. and Europe is the labor regulation environment in each respective country. (Botero et al., 2004)

I've presented evidence in this paper that argues that labor regulations have indeed contributed to the growth divergence between the United States and Europe. My results are empirically sound and explain historic and economic trends. Consider the United States, which is characterized by flexible market regulations and Europe, which is characterized by rigid labor regulations. In the post-war period, labor market rigidities allowed for "catch-up" growth and favored the European economy, which grew relative to the U.S. In the modern era, however, in which economies feed on innovation, as exemplified by the ICT sector, Europe's rigid labor regulatory market has become problematic, and even anti-productive. The U.S. on the other hand, has thrived and U.S. GDP levels and growth have come to dominate the modern economic landscape.

The results in this paper are consistent with the work done by Nickell (1997), and Van Ark, Timmer and O'Mahoney (2008), which argue that less labor regulation contributes to growth. However, Dew Becker and Gordon (2008) confirmed another school of studies that show that certain labor protections also caused greater productivity in Europe as firms invested more in their worker's skills. Thus, my results require additional support. I argue that labor regulations affected Europe and the U.S. differently depending on the time period. Further investigation is necessary into the environments in which labor regulations promote growth, for example a "catch-up" economy versus a mostly innovation-driven economy. Such research would better establish the link between specific labor regulations and labor productivity. This paper is a starting point and provides evidence that rigid labor regulations benefit post-war economies, such as Europe in the aftermath of World War II, and more relaxed labor regulations benefit innovation economies, such as how ICT growth is driving U.S. GDP growth in the 21st century.

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The Politcal Economy of Saudi Arabia

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Introduction

In an influential article published in World Politics, Michael L. Ross has concluded that oil hurts democracy (Ross, 2001: 356). Such a negative correlation of the wealth associated with oil production and democracy has become evident since the early 1970s, after the Organization of the Petroleum Exporting Countries (OPEC) was founded, and the oil-producing countries took control over oil prices. Countries abundant with oil, such as Iran, Bahrain, Iraq, Libya, and Saudi Arabia, failed to develop democratic structures, whereas oil-lacking countries, such as Egypt, Jordan, Lebanon, Morocco, and Tunisia, offered at least a limited degree of relative freedom to their people. The idea that oil hinders democracy was once again reflected in the recent Arab Spring, where oil-rich regimes faced less opposition, and were better prepared to oppress possible uprising than less oil abundant countries. Exceptions were in Bahrain and Libya, where the latter's opposition could overturn Muammar al-Qaddafi through NATO intervention (Ross, 2011: 17). All the other regimes that control vast amounts of oil appear to have the political, social, and economical means to keep themselves in power. These and other observations have demonstrated that there is a distinct negative correlation between the amount of oil produced by a country and the likelihood to become democratic. Saudi Arabia, the focus of this paper, is a classic state dominated by oil production (a so-called rentier state) and the most extreme example of this correlation. It controls at least one-fourth of the world's oil reserves (Okruhlik, 1999: 297). At the same time, Saudi Arabia is also the country with the least amount of democracy. Commonly, it is regarded as the most conservative of the Gulf Cooperation Council states (Ehteshami and Wright, 2007: 926).

The Rentier State, the Repression Thesis, and the Rentier Thesis

Whilst Dick Cheney has said the correlation between oil and authoritarianism is a mere coincidence where "the problem is that the good Lord didn't see fit to put oil and gas reserves where there are democratic governments," (Ross, 2011: 17) most economists and political scientists support one of the following two theories: the first theory states that political instability is a near certain outcome of oil wealth; the core idea of the second theory is that oil makes authoritarian regimes stronger by funding patronage and repressive apparatuses (Smith, 2004: 232).

In rentier states, the revenues, or rents, of states come from external actors which are added to the state's funds, rather than to private corporations or individuals. More recently, a "rentier state" has most often been associated with the oil-rich countries whose income is based on international petroleum sales (Okruhlik, 1999: 295).

In my analysis of the two theses, in this section I will examine the reasons why oil makes authoritarian governments stronger. To do this, I will look at the research conducted by Ross (2011) and Smith (2004). Their studies have concluded that "oil wealth is robustly associated with increased regime durability" (Smith, 2004: 232) and that "the oil-impedes-democracy claim is both valid and statistically robust; in other words, oil does hurt democracy" (Ross, 2001: 356). Moreover, the studies have shown that "the harmful influence of oil is not restricted to the Middle East. Oil wealth has probably also made democratization more difficult in states outside the Middle East, such as Indonesia, Malaysia, Mexico, and Nigeria" (Ross, 2001: 356).

Two theories explain why oil wealth is associated with regime durability. The first theory is often referred to as the "rentier thesis". The second theory is widely known as the "repression thesis". First I will examine the rentier thesis, which itself is divided into the "taxation effect" and the "spending effect", which I will discuss in that order. Since the government is able to fund itself through oil revenues, it has little to no need to tax its citizens. This eliminates the bureaucratic aspect of taxing governments. Moreover, historians and political scientists have demonstrated that historically taxpaying populations desire a government which represents their interests. Since the population does not pay taxes, they are less inclined to be unsatisfied by the makeup of the government (Ross, 2001: 332-333).

In addition to not collecting taxes, the autocracies distribute the oil wealth amongst the population, creating the "spending effect". The government is thus able to "buy off political consensus" (Smith, 2004: 233) and choose which social groups they wish to support with their oil rents. Unless the people support the government, they will not receive a fair distribution of wealth, which furthers the authoritarian rule. In relation to Arab Spring, whilst Saudi Arabia denoted $130 billion to increasing wages in the public sector, unemployment benefits, and housing subsidies, oil-poor autocracies such as Tunisia, Egypt, and Yemen tried to appease their citizens, but had much smaller monetary offers and were therefore much less successful (Ross, 2011: 18-19). By pouring money into the public sector, the Saudi government is able to "relieve social pressure[s] that might otherwise lead to demands for greater accountability" (Ross, 2001: 332)

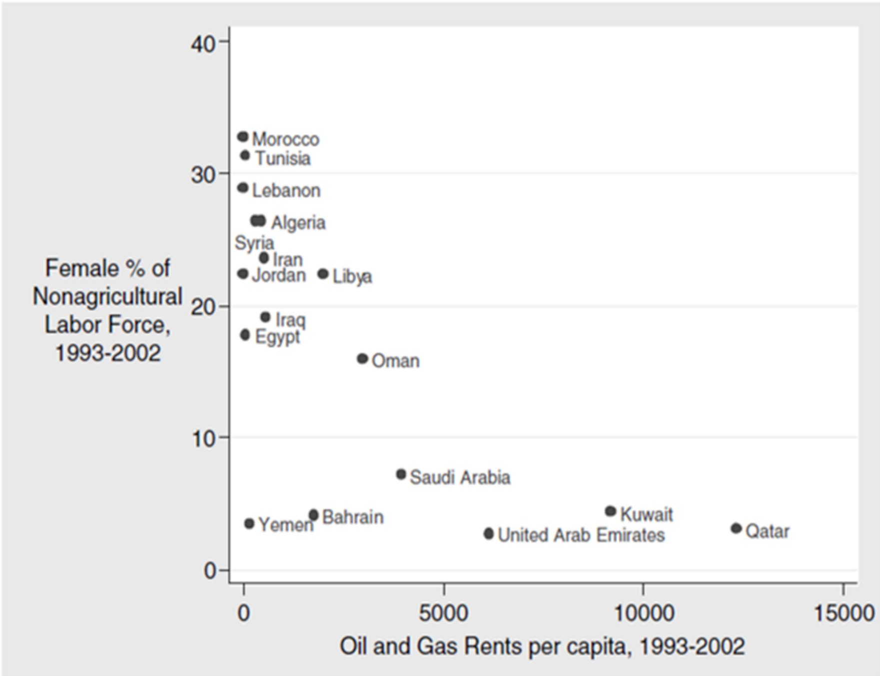
In contrast with the rentier effect, the fact that oil-rich governments put a large amount of money into the public sector does not mean that the citizens are entirely happy with their authoritarian rule. This describes the 'repression thesis', where peoples of these countries may wish for a more democratic government, but due to its oil wealth the government is able to spend vast amounts of money on armed forces, which are therefore loyal to the ruling group. One goal of these armed forces may be to defend the country from external threats. However, they are also able to forcefully stop uprisings among the population before the democratic aspirations can become widely heard (Ross, 2001: 334). The large oil-producing countries, Oman, Saudi Arabia, and the United Arab Emirates, are an example of this large military spending. During the Arab Spring, their armies were loyal to the government and willingly suppressed the protesters (Ross, 2011: 19).

The Effect of Oil on Gender Relations

Many people attribute the lack of women's rights in the Middle East to Islam. However, as detailed below, a study by Ross has given an economic explanation for this phenomenon. He has proposed that the patriarchal tendencies are due to their high oil production, rather than religion (Ross, 2008: 107). He links oil production to the lack of women needed in the workforce, thus limiting their political autonomy (Ross, 2008: 210).

In general, the effect of the exploitation of natural resources of a country on its manufacturing sector is described by the Dutch Disease Model. Ross was the first who used this model to demonstrate how an increase in oil production negatively affects female labor force participation. The influx of foreign currency – that is, the new wealth generated by oil sales – will raise the real exchange rate, making it cheaper for locals to import tradable goods from other

Figure 1: Oil Rents and Female Labor Force Participation in the Middle East (After: Ross, 2008: 117)

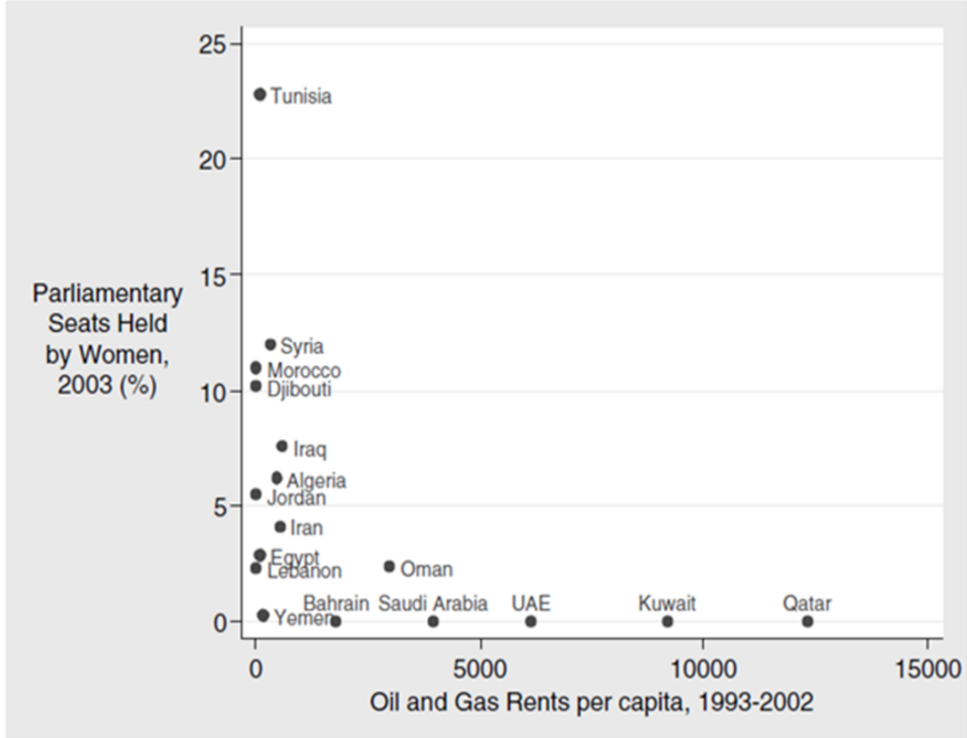


countries than to buy them from domestic producers. In addition, the new wealth will increase the demand for non-tradable goods such as construction and retail services (Ross, 2008: 109).

In many developing countries, women are largely employed in the traded sector, in low-wage jobs in export-oriented factories, and agriculture. These industries, producing for example textiles, garments, and processed agricultural goods, have hired mostly female workers. These jobs do not require much physical strength, training, or specialized skills. Thus, a large portion of the workers in these sectors are women, who can be easily hired by the employers, but who can also easily transfer between their jobs and their families more so than would be possible in jobs that require advanced educational training or specialized skills. In addition, factories that export are more likely to employ women because the firms create many jobs, meaning that the employed women do not take away jobs from men. These firms are often owned by foreigners who are less likely to care about whom they hire, especially when female wages are typically lower than male wages; it is, therefore, lucrative for the firms to hire women (Ross, 2008: 108). However, women are excluded from many parts of the non-traded sector, such as construction and retail, since these jobs typically entail heavy labor or contact with men outside the family. The decline of this sector will reduce the demand for female labor (Ross, 2008: 110).

Men predominantly work in the non-traded sector; its expansion will increase the demand for male labor and cause male wages to rise. In addition, due to increased oil revenues, the government is able to transfer part of the profit to the individual households. Since the households are financially more secure, the families are less inclined to send the women out to work (Ross, 2008: 110). The income effect caused by the increase of family income (due to the increase in male income) and the increase in family wealth (due to government support) result in a decrease in the female labor force participation.

Figure 2: Oil Rents and Female Parliamentary Seats in the Middle East (After: Ross, 2008: 117)



The consequences of a higher degree of female labor force participation are higher school enrollment and literacy rates for females, as well as a decrease in fertility rates, since families are more inclined to invest in the health and education of women if the women contribute towards the household income. In addition, the women promote themselves as individuals and are in contact with other women in the labor force, with whom they can take collective action (Ross, 2008: 107-108).

Ross analyzed oil production and employment data for all countries from 1960 to 2002, and data on female political representation for 2002. The independent variable in his investigation was Oil Rents Per Capita. His two dependent variables were Female Labor Force Participation (Figure 1) and Female Political Influence (Figure 2). The latter was determined by the fraction of female seats and female ministers in 2002 (Ross, 2008: 111-112).

Ross's findings indicate that "the states that are richest in oil (Saudi Arabia, Qatar, United Arab Emirates, and Oman) have the fewest women in their nonagricultural workforce, have been the most reluctant to grant female suffrage, have the fewest women in their parliaments, and have the lowest scores on the gender rights index. States with little or no oil (Morocco, Tunisia, Lebanon, Syria, and Djibouti) were the first to grant female suffrage and tend to have more women in the workplace and parliament and higher gender rights scores" (Ross, 2008: 116).

Major Challenges Facing Saudi Leaders

In this section, I will discuss four major challenges that the Saudi Arabian State has been confronted with throughout the last four decades. The challenges are: diminishing oil revenues, expensive external threats, rapid demographic growth, and the population's high expectations. A comprehensive

Table 1: Actual Saudi Oil Revenues (After: Krimly, 1999: 257)

Period	Returns in billion SR	Returns in billion US$
1970–1974	164	41
1975–1979	635	184
1980–1984	1,100	319
1985–1989	391	104
1990–1994	635	169

Sources: Kingdom of Saudi Arabia, Saudi Arabian Monetary Agency (SAMA), *Annual Report* (Riyadh: various years). See also Kingdom of Saudi Arabia, General Department of Statistics, *Statistical Yearbook* (Riyadh: various years); Kingdom of Saudi Arabia, Ministry of Petroleum, Minister's Office, *Al-Nashra al-Ihsa'iyya al-Bitruliyya*, various years; Organization of Arab Petroleum Exporting Countries, *Annual Report of the Secretary-General*, various years; Organization of Petroleum Exporting Countries (OPEC), *Annual Statistical Bulletin*, various years; OPEC, *Energy and Oil Statistics*, various years; Saudi Aramco, *Annual Report*, various years; and Arab Monetary Fund, *Al-Taqrir al-Iqtisadi al-'Arabi al-Muwahhad*, various years. For exchange rates, see Kingdom of Saudi Arabia, Ministry of Planning, *Achievements of the Development Plans, 1970–1993*, p. 18.

review of this topic has been published by Krimly (1999).

To begin with, I will examine the most prominent challenge, declining oil revenues. As shown in the section describing the rentier state, the Saudi Arabian elite finance their autocratic rule through oil rents. Oil revenues abruptly increased from 1970 to 1976, and then started increasing again in 1979, until they reached their highest revenue peak in 1981. After these two periods of growth, which were interrupted by a two-year period of decline, oil revenues began to sharply decline again from 1982 to 1986. This was followed by an increase in 1987, and a decrease in 1988. Following 1989, oil revenues started increasing at a relatively steady rate. This information is presented in Table 1 and Table 2. These data do not only show the dramatic decrease in revenues but also massive fluctuations. While it is clear that the decreasing oil revenues equate to less income for the regime, the data also show the unpredictable nature of funding that the regime had to deal with. These large fluctuations and the complexity of the variables that affect oil revenues make predicting said revenues an extremely difficult task. The oil revenue received by the regime is affected by multiple factors, ranging from levels of output, operating costs, and international market prices to complex contracts (Krimly, 1999: 255-256).

A series of expensive external threats have increased Saudi Arabian military expenditure. The first of these events was the Iranian Revolution in 1979, which overthrew Iran's monarchy, the Pahlavi regime, and replaced it with an Islamic Republic. Iran desired to use their momentum and spread the revolution. They intended to free the Persian Gulf states from their monarchic rule by replacing them with Islamic Republics, and to free the holy sites in Saudi Arabia. The change of the status quo in this area caused unrest for countries such as Iraq, Kuwait, and Saudi Arabia (Krimly, 1999: 256).

Secondly, the Iranian Revolution led to the Iran-Iraq War, which took place between 1980 and 1988. Iraq's government was afraid that Iran's Shiite Islamic Revolution would lead to a revolt from their own Shiite majority. Iraqi leadership thought they could win the war quickly by taking advantage of the "disorder and isolation of Iran's new government" (Encyclopædia Britannica Online, 2012). However, what had been thought to be a short war developed into a long-drawn war of attrition. This war included multiple attacks on oil tankers and oil fields within the Persian Gulf (Krimly, 1999: 256-257). Concerned that Iran would win the war, Saudi Arabia chose to financially back Iraq with an estimated $10-20 billion (Krimly, 1999: 258).

The third wave of external threats started in 1990, when Iraq invaded Kuwait, and Saudi Arabia was threatened by Iraqi invasion and occupation. They became part of the coalition force against Iraq and hundreds of thousands of foreign troops were stationed within Saudi Arabia, exposing the oppressed population to the ideologies of more democratic peoples. Saudi Arabian military spending increased due to their contribution in the coalition force, costing the Kingdom an estimated $55 billion dollars. The immense financial burden cast on the Arabian monarchy by these external threats is reflected by the large military expenditures in the official budget reports (Krimly, 1999: 257). The total spending increased from SR3.7 billion in the 1960s to SR277.2 billion in the 1970s and increased again in the 1980s to SR788.3 billion. From 1990-98 the Saudi military spending totaled SR541.13 billion (Krimly, 1999: 257-258). These large expenditures in the military sector can be looked at in two ways. Whilst in the section in which the repression thesis was examined, Ross (2001) and Smith (2004) attributed the increase of military spending towards the regime suppressing their people. Whilst this may certainly have historical truths, in retrospect of the last section, one must also contribute the increasing military expenditure towards defense from external threats.

As demonstrated in the previous two sections, oil rents have the ability to provide better public services, such as health care, and allow women to stay home rather than to enter the work force. These two factors in turn foster a growing Saudi population. Infant mortality rate dropped 15 percent from 1970 to 1992, while the fertility rate remained constant, a high 6.5 percent. The extent of this high population increase can be seen by comparing the 1974 census to that of 1992. Throughout those years, the Saudi population grew from an estimated 5.3 million to 12.3 million people, reflecting an average growth of 4.2 percent per year, which is among the largest growth rates worldwide (Krimly, 1999: 258). Not only has there been a tremendous increase in total population, but also a large urbanization rate which increased from 16 percent of the total population in 1959 to 80 percent in 1990 (Krimly, 1999: 258). This leads to the breakdown of the traditional, rural, extended family and the economic conditions associated with them. In addition to the high population growth and movement to the core, age-pyramids have indicated an extremely young population, which has led to an increased desire of high school graduates to seek higher education. University enrollment has grown from 8000 in 1970 to 170,000 in 1994 (Krimly, 1999: 259). Since there is tremendous change within the country, the structure of the government is increasingly challenged. The autocratic system is based on traditional, religious authority, and the change being promoted through education and urbanization is contrasting to those beliefs.

During the oil boom years, the increase in oil revenues made possible an increase of state expenditure. As oil revenues reached their peak and declined after 1982, the government had problems maintaining the level of expected distribution. The population's ravenous demand is portrayed by the share of private consumption relative to GDP. During the years of the oil boom, private consumption grew at a higher rate than GDP. Private consumption representing percent of total GDP increased from 11.5 percent in 1974 to 45.3 percent in 1984. Moreover, it continued increasing until 1986 where it reached 51.7 percent, while oil revenues had already been declining for four years. Following this, private

Table 2: Budgetary Deficits in Saudi Arabia (After: Krimly, 199: 263)

Year	Actual Revenues (SR billions)	Actual Expenditures (SR billions)	Surplus/Deficit (SR billions)	GDP (SR billions)	Deficit As % of GDP
1970	7.9	6.3	1.6	22.9	–
1971	11.1	8.1	3.0	28.3	–
1972	15.3	10.2	5.1	40.6	–
1973	40.6	18.6	22.0	99.3	–
1974	100.1	35.0	65.1	139.6	–
1975	103.4	81.8	21.6	164.5	–
1976	135.9	106.7	29.2	205.1	–
1977	132.2	137.1	(4.9)	225.4	2.2
1978	131.5	146.3	(14.8)	249.5	5.9
1979	211.2	185.7	25.5	385.8	–
1980	348.1	230.4	117.7	520.6	–
1981	368.0	283.3	84.7	524.7	–
1982	246.2	244.9	1.3	415.2	–
1983	206.4	230.2	(23.8)	372.0	6.4
1984	171.5	216.4	(44.9)	351.4	12.8
1985	133.6	184.0	(50.4)	313.9	16.1
1986	76.5	137.4	(60.9)	271.1	22.5
1987	103.8	173.5	(69.7)	275.5	25.3
1988	84.6	134.8	(50.2)	285.1	17.6
1989	114.6	149.5	(34.9)	310.8	11.2
1990	154.7	210.4	(55.7)	392.0	14.2
1991	161.9	266.4	(104.5)	442.0	23.6
1992	165.4	232.5	(67.1)	461.4	14.5
1993	141.4	205.5	(64.1)	443.9	14.4
1994	129.0	163.8	(34.8)	450.0	7.7
1995	146.0	169.0	(23.0)	469.4	4.9
1996	177.0	194.0	(17.0)	509.8	3.3
1997	204.0	210.0	(6.0)	547.0	1.1

Sources: SAMA, *Annual Report*, various years. See also Arab Monetary Fund, *Al-Taqrir al-Iqtisadi al-Àrabi al-Muwahhad*, various years; *Al-Hayat*, 4 November 1997, p. 4; and *Al-Iqtisadiyya* (London), 30 December 1997, p. 1.

consumption as a percent of GDP started declining, reaching 48.9 percent in 1988, and 45.5 percent in 1994. Nevertheless, the decrease in oil revenues occurred at a much quicker rate (Krimly, 1999: 260).

In the following, I will explain the high expectations of the Saudi public for various services. Since oil rent is Saudi Arabia's primary source of revenue, changes in the country's income are mainly a consequence of fluctuations of oil revenue. The state's income is greatly affected by many complex factors that determine oil revenue, as discussed above. Therefore, income is only to an inconsequential extent related to productivity. The popular belief of the labor force is that, since their productivity is not declining, their income should not either. Thus, the link between productivity and income is distorted (Krimly, 1999: 260). The public gladly accepted the new welfare of the oil rent as the status quo, however, maintained their lifestyle, as the revenue generated from oil declined. This created a gap between what society wanted and what the state could provide. This gap was extended through Saudi Arabia's growing population.

Regime Reactions

In the following section, I will examine the regime's reactions to the financial

challenges, the declining oil revenues, and increasing military spending, which were examined in the previous section. These created a widening gap between revenues and expenditures that required radical reductions in expenditures and subsidies. However, these were socially and politically unpopular, especially due to the demographic explosion and the population's high expectations. Therefore, the Saudi Arabian government adopted a policy of deficit financing, and tried to reduce expenditures and eliminate subsidies at low political costs. In addition, the regime facilitated minor changes in the political environment in order to take pressure off of unpopular fiscal reforms.

The Saudi policy makers began relying on deficit financing from the early 1980s onwards for the following reasons. To begin with, the Saudi Arabian government believed that declining oil revenues would only be short-lived, anticipated an increase within the near future, and hoped to build off their deficit through high future revenues. Therefore, they believed that through deficit financing they could avoid making unpopular cuts in the public sector. In addition, due to Saudi Arabia's accumulation of large external investments during the 1970s, deficit financing primarily did not require external borrowing, but could be undertaken through the liquidation of foreign assets. However, by the beginning of the 1990s, the Gulf War imposed a further serious external challenge, as the external assets the country had accumulated during the 1970s were exhausted, and oil revenues had continued to decline. As seen in Table 2, Saudi Arabian budgetary deficits as a percentage of GDP increased from 6.4 percent in 1983 to 23 percent in 1991 (Krimly, 1999: 261).

Clearly, controlling the deficit would require serious reductions in government expenditures. These were, however, unpopular among the population and therefore politically difficult to implement. Nevertheless, as seen in the table, the Saudi Arabian government managed to cut actual expenditures by 52 percent from its highest level of SR283.3 billion to its lowest level in 1988 at SR134.8 billion. However, at the same time GDP fell by almost 48 percent from SR542.7 billion in 1981 to SR285.1 billion in 1988. This clearly shows that the reductions in state expenditure resulted in a significant drop in the nominal GDP (Krimly, 1999: 262). The second wave of reductions followed: reductions of 12.7 percent in 1992, 11.6 percent in 1993, and 20.3 percent in 1994. During this period, however, nominal GDP did not drop but grew from SR442 billion in 1991 to SR450 billion in 1994. Moreover, throughout this time, private GDP grew 2.9 percent in both 1993 and 1994. This reflects that the country's private sector became less financially dependent on the state (Krimly, 1999: 263).

The reductions of government expenditures required a strict reorganization in public disbursements. Firstly these included major decreases in the amount of public investment, whilst only relatively small reduction in public consumption. The share of public investments relative to total government expenditure declined from 68 percent in the 1970s to 26 percent between 1990 and 1993. One reason for this was that the share of public investment was relatively high in oil boom years, during which it financed commercial projects such as petroleum refineries and pipelines, compared to overall government spending (Krimly, 1999: 264). In addition, it was politically easier to reduce spending on new projects than to decrease salaries or welfare activities that have long been implemented.

Secondly, education and health expenditures witnessed a tremendous increase of government expenditure. This increased from between 30.9 and 22.6 as a percentage of total expenditure in the 1970s to 68.5 percent by 1998. On the other hand, expenditure on infrastructure fell from between 41.1 and 49.3 percent in the 1970s to 23.6 percent in 1996. The majority of the population is extremely supportive of the increase in education expenditure, since the immense increases in population makes it necessary that the job market become more diversified. In addition, large infrastructure expenditures had become less necessary, since the Saudi Arabia's infrastructure was already largely constructed throughout the 1970s and 1980s (Krimly, 1999: 264).

The third and politically most difficult decrease in government expenditure was the reduction in subsidies. The industries that had been significantly subsidized by the government, such as the agricultural sector, had strong interests against the reduction of those subsidies (Krimly, 1999: 264). These powerful private interests were created by the large subsidies in wheat production and repelled the subsidy cuts, even though the program wasted multiple resources such as the area's valuable water. Nevertheless, since the early 1990s, the government has reduced subsidies on wheat and barley and decreased purchases at subsidized prices. This has led to a decrease in wheat production from 4.1 million tons in 1992 to 1.2 million tons in 1996. As such, by the mid-1990s, additional subsidies cuts had followed which raised the prices of oil products, electricity, water, telephones, and domestic flights (Krimly, 1999: 264-265).

Political Change and Opposition

Whilst in the first section I examined how oil rent leads to political stability, I will now investigate the opposing thesis, namely that oil wealth leads to political instability, as presented by Okruhlik (1999). Supporters of this opinion argue that oil rents generate opposition because of unequal distribution (Smith, 2004: 234) and that oil rents provide the necessary financial backing to state opposition (Okruhlik, 1999: 297). The high gains of oil rents give state oppositionists an incentive to physically take control of the government which heightens the risk of civil war (Smith, 2004: 234). Furthermore, it has been suggested that through rising oil rent the Dutch disease has led some sectors of the economy, such as the manufacturing sector, to be damaged due to their relative higher prices on the global market. Therefore, investors in these sectors are financially hurt by the increase of oil rents (Smith, 2004: 234)

The citizenry became more involved politically when the regime began to interfere in business and distributed wealth more unfairly (Okruhlik, 1999: 298). The al-Saud family is very influential in society through their systematic placement within the business and political sectors throughout the Kingdom, their marriages into and partnerships with influential families, and the laws and surveillance mechanisms they have created to control public opinions and discourses (Okruhlik, 1999: 301). Also, the control over "loyal armed forces that are not affiliated with the opposition" helps them maintain power, especially when force is needed (Ehteshami and Wright, 2007: 914). The regime is legitimized as "protectors of the faith" and as such partly kept in power by their religious supporters. However, Islam has fostered many different ideas about the regime; the fact that one fourth of universities were created and/or affiliated with Islam and housed intellectuals and resources that helped form oppositional ideas about the ruling family proves that not all citizens are pleased with the autocracy. Universities and mosques became "strongholds of political Islam" (Okruhlik, 1999: 303). Until the 1990's, political discourse was kept at a minimum due to the firm restrictions of political demonstrations and civil society associations (Ehteshami and Wright, 2007: 915). The tensions caused by the Gulf War propelled debates into a more accountable, public, and written platform (Okruhlik, 1999: 302).

These political movements began as petitions. The first, in 1991, was created by over 400 scholars, judges, and professors who sought the restoration of Islamic values (Okruhlik, 1999: 304). The regime was taken aback by the petition and the call for political change and as such responded with tightened security, deportations, mass arrests of citizens and scholars, and more influence in the media (Okruhlik, 1999: 304). When the regime realized that controlled reform could be in their interest, they made some progress that in effect legitimized themselves and allowed them to keep most of the power. This progress came in 1992 with the creation of the basic system of governance, the consultative council, and the reorganization of provincial administrations, all of which addressed the opposition's concerns while keeping power in the elite's hands through the advisory Majlis Al Shura (Okruhlik, 1999: 305). These political changes opened the door for groups such as the Committee for the Defense of Legitimate Rights and the Committee Against Corruption in Saudi Arabia (although the former, founded in 1993, had to relocate to London in 1994 due to harassment) whose goals were instituting participation in government, human rights, and the rule of law (Okruhlik, 1999: 306-307). By 2005, however, the Majlis Al Shura consisted of 150 highly educated, confident, and influential individuals who were able to advise, criticize, and scrutinize legislation, domestic and foreign policies (Ehteshami and Wright, 2007: 927). The opposition is now able to form their own civil groups and contribute to the discourse and direction of the legitimized state (Okruhlik, 1999: 309).

Conclusion

Saudi Arabia is the prime example of a rentier state and a country lacking formal democracy. This has led me to assert that the relationship between oil generated wealth and the regime's unwavering autocratic rule are tightly linked. The regime hinders democracy through methods prescribed by the rentier thesis and the repression thesis. In the second section of this essay, I have shown that oil wealth does not only hinder democracy and enforce an autocratic regime but also creates a lack in women's rights. The regime has nonetheless been faced with many internal and external challenges, which they have overcome and in doing so, have maintained their power. However, the growing opposition offers the regime new challenges politically and socially that will continue to be expressed for years to come.

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Economic Policies and Military Results: An Economic Approach to the United States Civil War

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The United States Civil War era produced a unique opportunity to examine two radically different economic agendas for two different governments and to analyze how those economic agendas influenced the final outcome of the conflict. As would be expected of an already well-established government, the Union was able to implement fiscal, monetary and international economic policies that complimented the war effort and allowed economic and strategic flexibility. Conversely, the newly formed Confederate government succumbed to irrational economic polices that largely destabilized an already undiversified export-based economy. The stark contrast between the two economic regions in itself allows for an interesting case study on economics. The North was the beneficiary of a strong manufacturing base and a well-founded tax system that decreased the reliance of the government on funding the war through printing currency. The South, already adverse to taxes due to northern manufacturer-favoring tariffs during the antebellum period, resorted to the printing press to finance military operations.[1] The contrast between the two separate governments' economic policies emerged later in the eventual Union victory.

Prior to the start of the Civil War in 1861, the North established itself as a manufacturing economy with robust growth and diverse, well developed markets for economic activity.[2] While the United States economy was largely agricultural at the beginning of the nineteenth century, technological advancements in manufacturing, production and transportation – most notably the steam engine – contributed to rapid economic growth in the North.[3] Merchants and factory owners were able to take advantage of mass production and larger geographical regions where they could make their goods available. Following the outbreak of war, the strength of the Union economy provided direct benefits for wartime financing and strategy. Unlike the Confederate dependence on cotton exports, Union politicians realized the flexibility of their market economy and utilized it to provide supplies and armaments for Union forces. While new technology and faster growing markets created more economic volatility in the Union economy, the Lincoln administration's policies of government support for railroad development and incentivizing westward expansion laid the foundation for future economic growth and stability, during and after the war.[4] Many of the Union policies during the war not only assisted in the war effort but also served as a template for establishing a nation that can adapt to increasing globalization. Policy makers expanded trade routes, invested heavily in infrastructure to take advantage of the size of the continent, and ensured that growing manufacturing sectors had the opportunity to flourish. The

1 Thornton, Mark. Tariffs, Blockades, and Inflation: the Economics of the Civil War. (Wilmington, Del.: Scholarly Resources, 2004), 34

2 Ransom, Roger L. Conflict and Compromise: The Political Economy of Slavery, Emancipation, and the American Civil War. (Cambridge [England]: Cambridge University Press, 1989), 201

3 Hormats, Robert D. "Abraham Lincoln and the Global Economy." Harvard Business Review 81, no. 8 (August 2003): 63

4 *Ibid.,* 61

economic policies of the Union, through decisiveness and well though-out planning, established an economic machine that was more than capable of responding to the crisis of the Civil War.

Entering the Civil War, the Confederate economy still relied heavily upon slave labor to support an agricultural economy. Advances in transportation technology largely benefitted the southern economy by allowing the agricultural region to ship cotton and food throughout the United States at a lower price. However, manufacturing and production process refinements failed to materialize in the future Confederate states as strongly as in the North. The distinct dichotomy that developed between the two regions became more apparent as Northern politicians started heavily promoting protectionist tariffs that would allow manufacturers to compete with European competitors.[5] The South remained reliant upon cotton exports to maintain economic growth and tariffs in the United States only caused retaliatory taxes in international markets that made southern cotton exports less competitive. Another important factor that affected the Confederate economy during the war period was the incidence of fighting in Confederate states. With the majority of battles occurring in southern states, infrastructure, factories and many economic means of production were systematically destroyed.[6] The aversion to taxes and tariffs resounded later in the failure of Confederate policymakers to establish a fiscal policy that was able to effectively raise revenue.

Both the North and the South during the United States Civil War experimented with different options to pay for military expenditures. The three main ways that the separate governments attempted to raise revenue included issuing government bonds, raising taxes, and printing paper currency. While both the Union and the Confederacy experienced difficulties with issuing currency, the strength and resolve of the federal government in the North provided succinct fiscal policy steps, including successful bond issuance and reserve accumulation, that directly contrasted with the South.[7] The Union fiscal policy was based upon the strength of the Northern economy and relied heavily upon tax collection and the issuance of debt to finance wartime operations. The Union government was able to establish over 85 percent of revenue through taxes or issuance of debt.[8] This gave the North a distinct military advantage as it was funded by a robust government finance system that provided ample supplies. Union monetary policy during the Civil war, while slightly inflationary, was able to avoid massive price increases due to the strength of established fiscal policy.

In direct contrast to Union fiscal policy, Confederate policy makers failed to amass large amounts of reserves to reinforce the value of their currency.[9] The decentralized nature of the Confederate states ensured that local governments would issue competing currencies and that a single secessionist currency would fail to maintain relevance. This made financing the war through fiscal means extremely difficult since the Confederate government struggled to issue debt, let alone collect taxes. According to Ball, "…the Permanent Confederate Constitution did not permit property taxes without a census based apportionment, with the absurd result that strict constructionists were able to prevent the taxation of real estate, livestock and slaves."[10] Slave owners and many individuals within the Confederacy during wartime were unwilling to contribute to a government formed directly in their interest and at their behest. The inconsistency between the goals of the Confederate government and the willingness of the general population to contribute to the war effort ensured the failure of Confederate fiscal policy. As a result, secessionist policy makers were eager to find another way to finance military expenditures. An attempt at external financing and foreign intervention resulted in even more disappointment.

The Confederate government during the United States civil war grossly overestimated the rigidity of the international cotton market and the power of an internal embargo when trying to attract foreign military aid by restricting cotton exports. As a massive net exporter of cotton, the Confederacy hoped to leverage its economic position into diplomatic power that could affect the outcome of the war. The policy of internal cotton quotas as well as an external Union navy blockade resulted in a substantial decrease in cotton exports, and the revenue they brought, further weakening the already poorly financed Confederate government. Foreign interests responded to the secessionist government largely by changing suppliers and bolstering the production capacities of exporters such as India and Egypt. The implementation of the King Cotton strategy represents an example of poorly managed Confederate economic policy and directly contributed to the military defeat of Confederate forces.

At the beginning of the Civil War, the Confederate economy was the largest producer of cotton in the international market and maintained production at the lowest cost.[11] While the Industrial Revolution in England and other countries in Europe significantly increased cotton exports for the South, it made the southern economy one dimensional and undiversified. Subsequently, after the Confederate states seceded, the handling of their economic policy underscored the lack of diversified sources of revenue and government finance. According to Ransom, "…60 percent of the [government] expenditures were backed by neither taxes nor borrowing" during the war time period.[12] The financing came from the printing press, where devastating price inflation promptly followed poorly managed monetary policy. Furthermore, the centralized, micromanaging Confederate government crippled the ability of economic policy to meet the needs of a dynamic war effort. The Confederacy's unyielding aversion to a strong central government lead to factions within the government's political structure contradicting each other and decreasing the effectiveness of policy action. Legislation took so long to make it through the procedural hurdles that it was often outdated upon implementation. In contrast, the more market-based Union economic effort combined with a successful naval blockade demanded a change of Southern economic strategy.

Once Confederate politicians realized the extent to which the Union navy would encumber their ports, they immediately, if half-heartedly, introduced a new international trade scheme. Instead of running the Union blockade for cotton exports to Europe, the Confederate government imposed an internal embargo on cotton in an attempt to inflict enough economic harm on European powers to induce intervention on secessionist behalf. The European economy preceding the United States Civil War period experienced rapid growth via the Industrial Revolution. As textile factories and new technologies allowed for greater levels of production, the South inferred

5 Smith, Andrew F. *Starving the South: How the North Won the Civil War*. 1st ed. (New York: St. Martin's Press, 2011), 43

6 Andreano, Ralph L. *The Economic Impact of the American Civil War,* 2d. ed. (Cambridge [Mass.]: Schenkman Pub. Co. 1967), 99

7 Ball, Douglas B. *Financial Failure and Confederate Defeat*. (Urbana: University of Illinois Press, 1991), 254

8 Ransom, Roger L. Conflict and Compromise, 201

9 Ball, Douglas B. Financial Failure and Confederate Defeat, 254

10 Ibid., 168

11 Thornton, Mark. Tariffs, Blockades, and Inflation, 30

12 Ransom, Roger L. Conflict and Compromise, 202

that a sudden stop of exports in cotton, a key raw material in manufacturing, would cause enough economic harm as to warrant intervention.[13] The King Cotton strategy represented an enticing idea for a beleaguered Southern wartime economy but was an utter failure following poor communication, passive policy agenda setting and weak resolve by Confederate politicians. The South proved unable to elect leaders with a clear determination to follow through with economic policies.[14] The result was an incomplete embargo strategy that miscalculated and overstated the importance of Southern cotton to European powers. The governments of nations such as France and England, instead of fearing for their immediate economic growth, resented the South for attempted to coerce them into conflict.[15] Instead of entering into a possibly long and costly war, European powers and other countries decided to invest in cotton production elsewhere. The substantial decrease in exports from the South during the civil war period directly resulted in investment in countries such as India, Egypt and West Africa and that eventually yielded impressive returns.[16] India and Egypt grew to become major cotton exporters and contributed substantially to a more integrated cotton market in the future. The embargo had an immediate short-term impact on European economies but drove them to long-term investment instead of abrupt intervention. From a European government point of view, military intervention in the American Civil War would incur costs equal to or greater than that of directly pursuing and establishing new cotton markets. By investing and diversifying in new markets, European economies insured against future problems resulting from single supplier reliance.

While the United States Civil War was undoubtedly a military affair, the role of economics and economic policies played a significant part in the eventual Union victory. Prior to the beginning of the conflict, the North had laid the groundwork for a robust economy that would serve well under the stress of adapting to and financing a war. Conversely, the southern reliance on agriculture and an undiversified economic base proved ineffective in financing a war machine. Further weakening the Confederate government was a series of fiscal, monetary and international policy missteps that resulted in low revenue, high inflation and a failure to entice foreign intervention, respectively. The Union's ability to impose sound fiscal, monetary and international strategies resulted in successful bond issuance, less inflationary pressure and a blockade on southern cotton exports. The economic policies of the Union and Confederate governments serve as ideal dichotomies that provide information for future policymakers in developed first-world and developing third-world market economics. The Union army eventually ended the Civil War conflict but the combination of successful northern economic policies and southern policy miscalculations hinted at a Confederate defeat from the beginning of the war.

13 Beckert, Sven. "Emancipation and Empire: Reconstructing the Worldwide Web of Cotton Production in the Age of the American Civil War." The American Historical Review 109, no. 5 (December 1, 2004): 1410.

14 Ball, Douglas B. Financial Failure and Confederate Defeat, 12

15 Ibid., 69

16 Beckert, "Emancipation and Empire: Reconstructing the Worldwide Web of Cotton Production in the Age of the American Civil War." 1406-1405

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How a Breakthrough in Greener Sources of Energy will Change the Global Economy

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Abstract

This narrative will define green technology, determine what constitutes a breakthrough, and elaborate on the global economic effects that will result from breakthroughs in green technology. Statistics and predictions will be provided in order to examine the effect that green energy has on different regions and economies, and how shifts in sources of energy will impact the global economy.

Preface

Recently there has been a global effort to develop alternative forms of energy, in order to reduce our reliance on non-renewable energy sources. These technological developments in green energy have been progressive but there has yet to be any revolutionary breakthroughs, which would substantially change the structure of our global economy. Breakthroughs in green sources of energy have the ability to cause a global reduction in the price of energy and promote an abundance of energy availability, which could lead to an explosion of economic growth worldwide through the subsequent increase in productivity.

Definition

Before we can analyze the possible implications of "green" technological developments though, we must first define the term. Green energy most commonly refers to any source of energy that reduces emissions, such as energy procured from renewable natural resources like the sun and the wind. We will focus primarily on developments in solar and wind energy throughout this discourse as they are considered the leading forms of green energy. Let us also define the term "breakthrough" in order to more accurately portray how breakthroughs in green technologies will impact the global economy. A breakthrough is any dramatic and important discovery, especially in the field of science, such as the discovery of electricity. A breakthrough in green technology would be exemplified by a momentous innovation with the power to substantially augment our current global economic environment.

Historical Background

But what really constitutes a breakthrough? Historically, breakthroughs have been recognized as radical changes that have revolutionized a particular system. For instance, the Industrial Revolution that occurred in the 19th century had a profound effect on the world's economic, social and cultural conditions of the times. It can be argued that the breakthrough in energy discoveries, such as the mass implementation of refined coal, catalyzed this period of growth and bolstered the dramatic increases in production capacity. This is because coal was used to fuel machinery, mainly manufacturing machinery, and thus drastically increased the amount that society was previously capable of producing. Prior to coal's utilization on a major scale, the favorite form of combustible energy was created from burning wood. Coal though, burns hotter and faster than wood and so was more effective on an industrial scale.

The increases in production capacity that coal provided led to a list of global economic developments, as well as dramatic changes in the social, cultural and political structure of the world. The production increases that coal allowed for created ample employment opportunities and supported continuous, sustained growth of average income. The increases in income subsequently led to increases in population. From this example, we can see that a breakthrough must be a discovery that transforms current standards, in order to be defined as such.

Breakthroughs and their effects on Global Energy Prices and Availability

Current Breakthroughs

As we speak, scholars and professors are working toward technological breakthroughs in green technology. For instance, MIT professor of energy Daniel Nocera claimed to have made a breakthrough that would revolutionize solar energy generation, by solving the problem of solar energy storage. Previously solar energy was only viable during times the sun was shining and the storage of solar energy was prohibited by cost and technology. If solar energy could be controlled and stored than theoretically energy shortages would be eliminated. According to Nocera, "Sunlight has the greatest potential of any power source to solve the world's energy problems. In one hour, enough sunlight strikes the Earth to provide the entire planet's energy needs for one year" (Nocera, 2008).

If Nocera's prediction proves to be true than resolving the issue of solar energy storage would have drastic impacts on the energy industry and global economy. Hypothetically, based on multiplication of those terms, in one year we would be able to produce 8,760 times the amount of energy we currently demand annually (Nocera, 2008). This would cause an explosion of growth, which would include a long list of potential benefits and faults, which we will return to later in the paper.

Economic Effects

If a breakthrough such as Nocera's were to occur than it would be possible to substantially decrease the price of energy, based on its surplus of supply. It is also widely accepted that lower energy prices increase economic health. This is because the low cost of energy reduces input cost for nearly all goods and services. This reduction in cost allows businesses to provide consumers with more affordable goods and services, which allows for more disposable income and encourages spending. The opposite is true as well. High energy prices slow economic growth in most areas except those where the economies are dominated by energy production. This is because high energy prices drive up input costs and thus increase prices for good and services.

Currently, price comparison between energy sources favor fossil fuels, but a breakthrough creating a reduction in prices has the potential to cause a shift toward green energy. This shift would lead to the development of green energy production plants, opening up employment opportunities. Producing energy requires labor and capital, the drivers of an economy's health. It creates job opportunities and supports even more labor than it generates directly, due to its long supply chain and laborers' income expenditure.

Energy Availability and its Effect on Economic Growth

Labor and Capital

Economists usually group energy created jobs into three categories: direct jobs, indirect jobs and induced jobs. Direct jobs are held by those who produce and deliver energy to consumers. Indirect jobs represent positions created in industries that supply the energy industry with goods and services. Induced jobs are created by the expenditure of salaries paid to those employed in the energy industry. People directly and indirectly employed then spend their incomes and generate demand for goods and services. This subsequently increases aggregate demand and creates job opportunities in unrelated industries.

Most direct job opportunities are created in the construction and operation phases, while indirect jobs are created in the manufacture of supplementary products, such as the steel used to build wind turbines. Jobs in the construction stage are temporary though, and so are described in terms of average employment per unit of generation capacity. The term job-years is used to describe this measurement. One job-year is equivalent to full time employment for one year. Also, job-years per mega-watt are used to measure the number of job-years required to construct, manufacture and install one mega-watt of capacity.

We can use job-years per mega-watt to see how many jobs are created by each mega-watt of energy produced. In the United States each mega-watt of solar energy produced approximately 19 direct jobs, 34 indirect jobs and 49 non-us jobs. Wind and natural gas both produced about 5 direct and 8 indirect jobs (World Economic Forum, 2012). Solar energy production creates a great deal of labor opportunity because of the solar panels require for energy storage and production. Solar panels are modular and require a lot of labor for manufacture and installation. Many components required for solar and wind energy production are also manufactured outside the United States and imported, which creates indirect jobs internationally as well as domestically. Once construction is over, many permanent direct jobs remain due to the operation requirements of the new power supply sources. Indirect jobs are also created in operations such as fuel supply, janitorial supplies and other professional services.

Besides job creation, energy's importance in national, regional and global economic health is also reflected in its share of business sector GDP, in relation to other industries. Statistics based on ten-year averages of the most recent data show that energy related industries in the United States composed 5.9% of business sector GDP, while other countries such as Norway accounted for 19.1%. Norway's energy industry also contributes to a larger portion of business sector GDP than its manufacturing, health and social work industries (World Economic Forum, 2012).

Although the energy sector makes up a large demographic of the business sector GDP its direct creation of labor is much lower. Its need is not for large quantities of laborers, but for highly skilled, highly paid labor. As a result of the higher salaries, laborers in the energy industries contribute more absolute spending per capita to the economy than the average worker. This increased spending by direct and indirect employees also fosters growth in unrelated industries, as well as total economic growth.

The Effects of Green Energy on Different Regions and Countries

India's economic growth is currently hindered by their poor quality of power supply. Because of this, much of their population is excluded from the benefit of economic growth. India's government realizes that inclusive energy development to their entire population is crucial to their national economic development. In order to provide adequate electricity to its population, India must increase current capacity to over 300 GW by 2017. It is also important that India begin developing renewable energies due to their annually increasing demand for oil. India's demand for oil in 2015 is predicted to be 41% higher than it was in 2007, and approximately 150% higher by 2030 (Arora, Busche, Cowlin, Engelmeier, Jaritz, Milbrandt, and Wang, 2010). This intense dependency puts India at risk of falling victim to oil's price volatility.

The dependency is clearly shown by the proportion of energy generated by each type of fuel. Total power generation capacity in India was 159 GW in March 2010. 64.3% percent was attributed to fossil fuels (coal, gas and diesel), while only 9.7% was attributed to renewable energy. 84 GW of this measurement were created from coal, with 1 GW and 17 GW coming from diesel and gas respectively. Renewables only accounted for 15 GW. Also, 83% of renewables are also controlled by the private sector while fossil fuels are still predominantly controlled by state and central powers. This may be due to the fact that some political campaigns tend to be funded by corporate oil conglomerates and so have obligations to these oil producers that require them to maintain societies' focus on oil as a primary source of fuel. Corruption issues within governments, especially in developing countries, allows government officials to hoard oil for themselves and consequently drives up prices.

The largest demographic of renewables are controlled by the private sector. This may be because wealthy entrepreneurs and investors see the value creation and potential upcoming shift from non-renewables to green energy. When a prospective breakthrough occurs the market will change rapidly and investors in the private sector want to be included in this tremendous growth opportunity. Investors know that renewable energy sources will increase energy independence and hedge against volatility in the price of fossil fuels. Competition for a limited quantity of fossil fuels drives up prices. If renewable energy can be generated at a lower or similar cost than oil prices will decrease in order to stabilize demand. This decrease in price will cause a shift from fossil fuels toward green energy generation. If green energy generation undergoes this shift and prices can meet rates comparable to fossil fuels than there will be a remarkable shift toward the former of the two.

Shifts in Sources of Energy

There has already been a great deal of growth in green technology without any major breakthroughs. For instance, in 2009 India added 1338 MW of wind capacity to a reach a total of 10,925 MW. This was a growth rate of 14% in one year and contributed to 3.5% of the global market for wind generated energy. By 2010 India had 12,009 MW of wind capacity, which represented 70% of their total renewable energy capacity (Arora, Busche, Cowlin, Engelmeier, Jaritz, Milbrandt, and Wang, 2010). The global initiative has already shifted toward green technological development and it may be expected from historical cases of energy breakthroughs that a profound technological innovation in green energy will only cause this shift to increase exponentially.

Political Initiatives and Effects

This current growth and subsequent shifting can be explained by the recent abundance of government initiatives, as effective, inclusive, and equitable governance is a precondition for, and a measure of development. As stated earlier, the Indian government in particular has put in place different organizations, acts and ordinances in order to ensure desired growth in the energy sector. For instance, the Ministry of New and Renewable Energy (MNRE) was established in 1992 in order to facilitate research, design and development of renewable energy to be employed throughout the country. MNRE is intent on reducing India's dependence on imported oil, improving energy security and increasing the proportion of clean or "green" energy capacity. The Electricity Act of 2003 has also been a progressive step towards liberalizing the power market in India, encouraging competition and drawing investment. It mandates that requirements be established for purchase minimums of renewable electricity sources and allows penalties for non-compliance (Arora, Busche, Cowlin, Engelmeier, Jaritz, Milbrandt, and Wang, 2010). These political incentives are necessary for broad nation-wide and worldwide growth and can be seen across a wide spectrum, including developing nations as well as wealthy oil-based economies.

Growth Potential of Rich and Poor Countries

Developing countries have the greatest opportunities for capitalizing on green energy breakthroughs. The green approach to energy production allows emerging countries a chance to forego unsustainable and wasteful production methods, as they are less constrained than developed countries that are locked into investment choices and sunk capital from prior decades. As I said earlier in the paper oil conglomerates have funded political campaigns, and so politicians that have received funding have obligations to these corporations, which cause politicians to focus our demand toward oil rather than alternatives. Rich countries are more intricately tied to these obligations than developing countries that have the chance to begin with a clean slate. This clean slate allows them to make decisions based on future prediction rather than political obligation, and so growth potential in the green energy sector is currently much higher for developing countries.

Although developing countries are focusing on green technologies it is notable that oil based economies have shown comparatively little interest in developing their production of sustainable energy. The Kingdom of Saudi Arabia in particular has conducted some research in developing green technology but also continues to shun further implementation due to belief that the oil based economy will continue to perpetuate for some time. It is understandable that they would like to prolong oil dependence, but it is popular belief among scholars within Saudi Arabia and other oil rich countries that they must consider increasing technological development of green energy in order to secure their economic future and reduce the possibility negative environmental impact.

In one dissertation from Dr. Yasser Al Saleh, a post-doc at Masdar Institute of Science and Technology, a number of scenarios are presented hypothesizing different routes of action and their effects, based on theoretical discoveries. In the first scenario, a world of increasing oil availability and decreasing environmental concern is depicted. In this case Saudi Arabia may choose to maximize its oil production and further expand operations in order to become the world's unsurpassed supplier. As a result of this market flooding strategy oil price may steadily decrease to as low as $10 per barrel. This low price would still ensure reasonable revenue to Saudi Arabia, whose production costs are very low, estimated as low as $1.50 per barrel at present (Yasser Al Saleh, 2009: 657). This approach even has the potential to drive other oil-based economies out of the market, including OPEC (Organization of the Petroleum Exporting Countries) members. Another scenario illustrates a world of decreasing oil availability and increasing environment concern. In this case Saudi Arabia may choose to enhance the viability of renewables such as solar and wind generated energy and decrease production of oil in order to preserve the lifetime of its most precious export. Also, being an increasing urbanized and industrialized nation that is blessed with abundant solar radiation and reasonable wind resource a future in green energy is not unlikely (Yasser Al Saleh, 2009: 658). Ultimately, oil based economies have the potential to thrive in a world of green breakthroughs if they use their wealth to pursue green development and are lucky enough to have certain natural resources such as ample solar radiation and wind velocity.

Hypothetical Externalities

It is uncertain which of these directions our future will follow, and even more uncertain are the externalities that will occur due to the change in price and availability of energy. For instance, if either oil or renewable energy reached all time price-lows than global consumption will almost undoubtedly increase significantly. This increase in consumption may lead to remarkable developments in technology, spawning a new age renaissance of which discoveries are birthed that we cannot yet fathom. Space exploration may reach new levels of productivity, which may lead to discovery of resources, possibly new elements, and potentially even living organisms outside of our atmosphere. This could lead to opportunities of trade, providing technological developments far more advanced than our generation has been exposed to. It may also lead to war, land acquisition or mass fatality. Both cases would pose a significant change in our global economic structure. The low energy prices may also lead to occurrences of higher probability such as increased usage of automobiles due to cheap fuel costs. This increase in driving could then lead to an increase in traffic and subsequent increase in the global number of car accidents annually. We can never predict with any certainty what kind of effect a breakthrough in green technology will have, but we can assume by definition that the impact will be prodigious and widespread.

Conclusion

It's obvious that the world is moving toward a shift in energy sources, from the fossil fuels that catalyzed the industrial revolution to renewable green energy, which may instigate the next global economic revolution. This shift has been noticeable and progressive but hasn't yet experienced any truly astonishing breakthroughs that would significantly decrease price and increase availability of green energy. Instead the shift has been fueled predominantly by private investment with the hope of a breakthrough that would allow overwhelming growth economically throughout the world. But what kind of effect would this growth have on the world? In all honesty, we can never be absolute in our predictions but we can imagine hypothetical situations by extrapolating current and past occurrences.

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