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The

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The Economics Department and Omicron Delta Epsilon congratulate **Jim Myers**, winner of the *2012 Dwight D. Eisenhower Society / R.M. Hoffman Family Memorial Prize in Economics*. The Eisenhower/Hoffman Prize is awarded to the economics student writing the best quantitative paper or project with public policy implications.

The Economics Department and Omicron Delta Epsilon congratulate **Julie Weisz**, winner of the *2012 Best Thesis Award*.

The Economics Department and Omicron Delta Epsilon congratulate **Julie Weisz**, winner of the *2012 Stock Writing Prize in the Social Sciences*. Julie's paper, Effects of Feedback on Residential Demand for Electricity in Demand Side Management Programs, was nominated by Professor Baltaduonis.

The Economics Department and Omicron Delta Epsilon congratulates **Kevin Lugo**, winner of the *2012 Glatfelter Prize*, awarded to one student with junior standing possessing excellent scholarship in the social sciences.

The Economics Department and Omicron Delta Epsilon congratulate **Taylor Smart** for receipt of a *2012 Mellon Grant.*

The Economics Department and Omicron Delta Epsilon congratulates **John Weis IV**, winner of the 2012 *Dr. and Mrs. William F. Railing Fellowship for Faculty-Student Research in Economics*.

The Economics Department and Omicron Delta Epsilon congratulate **Beth Adams** and **Ondrej Krasny** for their induction into Phi Beta Kappa. Phi Beta Kappa celebrates and advocates excellence in the liberal arts and sciences. Its campus chapters invite for induction the most outstanding arts and sciences students at America's leading colleges and universities.

The Economics Department and Omicron Delta Epsilon congratulate the following students for their achievements in the 2011-12 academic year:

Economics Graduation Banner Carrier: **Beth Adams**

2010 Economics Honors Graduates: **Beth Adams**
Ondrej Krasny
Lyudmila Marinova
Jim Myers
Elena Rubino
Julie Weisz

Omicron Delta Epsilon would also like to thank our outgoing officers, *Lyudmila Marinova and Beth Adams.*

CONTENTS

Environmental Justice: Where are the Fracking Sites?
Elizabeth Adams

Abstract

This paper looks at the variables that determine the location of hydraulic fracturing wells. Using cross-sectional data on Texas counties, we test whether county income level and the percentage of the population that is minority are significant indicators of well location. This study mirrors other studies that focus on the location of undesirable land uses such as landfills. Our study finds that income level and the size of the minority population are not statistically significant indicators of hydraulic fracturing well location.

I. Introduction

The method of hydraulic fracturing used in the oil and gas industry has been utilized for many years. More recently in the natural gas industry, the method of hydraulic fracturing, commonly known as fracking, has been combined with horizontal drilling in order to access more gas from each well. The well not only extends vertically into the deep shale basins, but also horizontally from the kickoff point up to 10,500 feet outwards (*Hydraulic Fracturing*). This new technique as well as the discovery of Marcellus shale along the east coast has brought fracking to the attention of the public at large. The potential environmental and health impacts of fracking wells on the surrounding area will be discussed later in the paper and are widely debated. The question of interest for this paper, however, is how great is the impact of local income levels and other demographic measures as indicators of where natural gas wells are located.

The question this paper focuses on is interesting because it investigates one example of externalities resulting from natural resource extraction. The difficulty of these externalities is balancing the need for the service with the unaccounted for cost of accessing it. To explore this a bit further, consider that natural gas could be the solution to the United States' dependence on foreign oil because the country has many large shale deposits, the rock formation that holds

the natural gas. Natural gas would also boost the economy as a new area of development. It burns cleaner than other widely used fossil fuels so it could help solve problems with greenhouse gas emissions. The downside of this venture is the externalities that come from drilling natural gas wells. Research is just beginning to emerge on the health impacts of hydraulic fracturing wells for people and the environment. This makes it difficult to form a strong argument for the existence of this particular negative externality. Instead, this paper will simply look at where these wells are being located.

The initial motivation for this paper is the current debate on Marcellus shale. Watching the documentary *Gasland* serves as further inspiration because the families that seem to be dealing with the problems associated with natural gas wells appear to have lower incomes. The idea for the model used in this paper is inspired by the models set up by Boer et al. and Pastor et al. These two articles investigate the claims of environmental racism with regard to the location of treatment, storage, and disposal facilities (TSDF). The research in this paper applies a similar model to the location of natural gas wells, which will be discussed further in the literature review section. Texas counties are the focus of this analysis because data is most easily accessible for this area on all of the variables included in the model.

Assuming that there is some negative externality from natural gas wells, whether it is the loss in land aesthetics or water contamination, our interest is in the equality of the distribution of this externality. Economists are interested in the location of sites that result in some negative externality, such as hazardous waste facilities and landfills, to see whether they are disproportionately located near a certain portion of the population. This new area of interest has culminated as the environmental justice movement. Environmental justice "is the principle that all people and communities are entitled to equal protection of environmental and

public health laws and regulations" (Brulle 2006). Is there environmental justice in the location of natural gas wells? Similar questions have been asked by other researchers but we have not found another paper on the application to the natural gas industry.

There are three economic theories that have been developed that pertain to the issues highlighted by the environmental justice movement: discrimination, the Coase theorem, and the theory of collective action (Hamilton 1993). Discrimination and the theory of collective action are the main points made by researchers in support of the environmental justice movement. The results of Hamilton's study indicate "that firms processing hazardous waste, when deciding where to expand capacity, do take into account variations in the potential for collective action to raise their costs" (Hamilton 1993). This is just one specific, illustrative example of the theory of collective action. Discrimination is very similar to this but references specific demographic characteristics as the distinguishing factor in firms' decision-making with respect to the location of undesirable land uses.

The Coase theorem alternatively states that "even in the presence of externalities an economy can always reach an efficient solution provided that the costs of making a deal are sufficiently low" (Krugman et al. 2007). Applying this to the location of fracking wells, a well should be located where the benefit from the wells exceeds the costs. One can argue this theory does not hold true because the health impact of the drilling exceeds the benefits to the economy. This is an especially poignant argument today with the recent statement released by the Environmental Protection Agency (EPA). The EPA stated, in response to water contamination complaints from the community of Pavillion, Wyoming, that "the explanation best fitting the data…is that constituents associated with hydraulic fracturing have been released into the Wind River drinking water aquifer" (Llanos

2011). In the past, EPA studies have supported the findings of the natural gas companies that fracking does not cause water contamination. New findings may change the current leniency the natural gas industry benefits from.

Before we discuss the empirical analysis behind the paper further, it is first important to understand some of the politics behind the controversy of hydraulic fracturing wells. The main point that will be addressed here is the exemptions from federal regulations that the natural gas industry has accumulated. The most notable exemptions are from the Clean Air and Clean Water Acts as of 1990 and 1987 respectively (*New York Times*). In 2005, Congress exempted natural gas drillers from having to provide detailed reports on the potential environmental impact of some of their activities, thus exempting them from the National Environmental Policy Act (*New York Times*). Again in 2005, after an EPA study was challenged by one of its own members saying that the study's conclusions were unsupported and that some members of the study's peer review panel had conflicts of interest, Congress still exempted hydraulic fracturing from the Safe Drinking Water Act (*New York Times*). Other exemptions for hydraulic fracturing include from the Superfund Act in 1980, the Emergency Planning and Community Right to Know Act in 1986, and exemption from the Resource Conservation and Recovery Act in 1988 (*New York Times*). This relatively large list of government approved exemptions from regulations that ultimately protect Americans' health adds to our interest in the environmental justice claims that will be investigated in this paper.

II. Literature Review

Our interest in the topic was partially inspired by such articles as "The Gas Dilemma," written by Bryan Walsh of *Time Magazine* that begins by noting that the great energy potential of natural gas comes with "the catch" that it could come with significant environmental and social costs. The environmental justice

movement is interested in such situations as the equal distribution of these costs across society. The movement has in recent times been gaining attention from more and more academic literature. The goal of much of this literature is to determine whether or not demographic inequalities characterize the location of sites that pose some risk to the surrounding population. Boer et al. considers the location of TSDF. Other authors have studied the location of other "locally undesirable land uses" such as landfills (Been 1993). One of these land uses that has not be researched in depth is the location of hydraulic fracturing wells. This paper adapts the methods used by other researchers on environmental justice issues to see if the locations of these wells are characterized by demographic inequalities.

The known impacts of hydraulic fracturing wells are habitat fragmentation and the risk of a fluid spill. Hazardous chemicals are used in fracking to break the shale. When the fluids come back up, they are moved to a membrane-lined storage pad to dry out so the water from the mixture can evaporate. If the pad tears or there are heavy rains during this process, these pads can develop leaks or overflow. A controversial hazard of fracking wells is the potential contamination of groundwater and more specifically residential wells. This would be caused by the release of Normally Occurring Radioactive Material (NORM). When the shale is broken, NORMs can leak up through the ground along with some of the fracking fluids. With these risks in mind, we continue our review of related studies to see how their methods can be applied to this new land use.

The econometric model used in this paper utilizes variables relevant to this study from previous literature that also evaluates environmental justice claims. In many of the other studies there are measures of the presence of an undesirable land use such as TSDF. This study uses a measure of the number of wells in a county as the dependent variable (Hamilton 1993, Boer et al. 1997).

In similar studies there are usually independent variables that account for logical reasons for the location of such a facility such as community waste generation or the cost of locating in an area (Hamilton 1993, Boer et al. 1997). The study presented in this paper similarly uses average land value to account for the cost of locating a well in a specific area.

In the study done by Boer et al., the authors found both median household income and per capita income to have statistically significant coefficients so this study uses median household income because it is less influenced by outliers (Hamilton 1993, Boer et al. 1997). The final major influence you will see in this paper from previous literature is the use of simultaneous equations. The use of this type of model is consistent with the article written by Pastor et al., which investigates the disproportionate siting and minority move-in hypotheses. This brief overview justifies the modeling techniques used here because it shows that while this study explores a different issues, its structure is based on previously peer-reviewed work.

III. Modeling

The basis of the model in this paper is the question of whether or not local income levels and other demographics can indicate to a certain extent where natural gas wells are located. There is evidence both for and against the hypothesis that these factors do impact well location. One specific claim related to the environmental justice argument is that firms consider the potential for communities to mobilize and engage in collective action in deciding where to locate locally undesirable land uses (Hamilton 1993). Hamilton finds that commercial hazardous waste firms did take this factor into account in deciding where to add capacity during the period 1987-1992. His explanation of this result is that "the differing degree to which groups organize to demand compensation and raise a firm's costs of choosing a particular location drives a wedge between

the social costs of its externalities and the costs voiced through the political process of its site selection" and therefore challenges the outcome of the Coase theorem (Hamilton 1993). The location where the potential for collective action is the least may not be where the damage of its externalities is the least (Hamilton 1993). This is just one piece of evidence from past research that suggests that demographic characteristics that stereotypically suggest less potential for collective action significantly impact the location of facilities that bring with it negative externalities born by the surrounding community.

Other potential evidence that would support our hypothesis would be if the coefficients on the income and/or the minority population variables are statistically significant in difference from 0 given our data on fracking wells and demographics of counties in Texas. Contradicting evidence would be if the coefficients on the previous variables were not statistically significant yet the coefficients on the control variables were. To test to see what evidence can be gathered from this analysis we first used the following model:

$$Wells = \beta_0 + \beta_1 Resource + \beta_2 Income + \beta_3 Minority + \beta_4 Population + \beta_5 Land$$

The hypothesis is that the income and minority population variables do significantly impact the number of wells within a county. These two variables are the focus of this research. The control variables include a proxy variable for the presence of natural gas (*Resource*), population size (*Population*), and the land area of a county (*Land*). Hamilton's paper illustrates the reason why the theory holds that these two variables may be significant, because stereotypically both low income and minority communities are seen as having less collective action potential against such issues as fracking well location. *Resource* accounts for the fact that firms will build wells where there is natural gas to extract. *Population* and *Land* are included because they are control variables included in other comparable models and they account for the fact that the less land there is open, the fewer wells that

can be built due to the space required for the construction. According to the Pennsylvania Department of Conservation and Natural Resources, each natural gas well site requires between 3 to 5 acres when fully constructed.

The ordinary least squares (OLS) method is first used to estimate the coefficients of the multivariable regression but the initial model is not correctly specified. We find that our initial model has simultaneity bias and correct for this by using the two-stage lease squares (2SLS) method. Additional variables are included after further research. The final model we work with is a simultaneous equations model where *Wells* and *Income* are endogenous variables and *Resource, PopDensity, Minority, Value1997,* and *Education* are exogenous variables. The simultaneous equations that will be estimated are as follows:

$$Wells = \beta_0 + \beta_1 Resource + \beta_2 PopDensity + \beta_3 Minority + \beta_4 Value1997 + \beta_5 Income$$
$$Income = \alpha_0 + \alpha_1 Education + \alpha_2 PopDensity + \alpha_3 Minority + \alpha_4 Value1997 + \alpha_5 Wells$$

Opponents to environmental justice claims argue that firms' do not choose to locate an undesirable land use in low income communities. They argue that the location of the site is due to the cost of land because land costs are usually lower in low income communities or that low income households often relocate near these sites because land costs decrease. We do not have panel data to account for simultaneous changes in number of wells and land value. Instead, we use county income level as the instrumental variable. This study therefore cannot imply anything about the firms' or the communities' decision making. It is assumed that county demographics before the more widespread construction of natural gas wells are determined by the exogenous variable for 1997 land value. It is also assumed that this land value is equivalent to the price natural gas companies would have to pay in order to locate a well there. Given these two assumptions, we can then account for the significance of demographic characteristics and the included control variables on the number of wells in a county. The hypothesis

is that county income levels do have a significant impact on the number of wells located in the county, holding constant the impact of all other explanatory variables. This hypothesis would support environmental justice claims. We continue with a more in depth description of the data used in this analysis before examining the regression results.

IV. Data

The ideal data set would be a panel data set including data on all counties in the United States for a number of time periods. The data would include measures of the number of wells built during each time period, the amount of accessible shale within each county, population density, the average value of land, the percentage of the population with a college degree, the percentage of the county population that is minority, and the median income of each county for each specified time period. Acquiring this data would allow the study to better analyze the firms' decisions on locating natural gas wells. By lagging some variables such as income, the number of wells built in the next time period would presumably reflect data the decision maker would have from the previous period. With this data, the impact of demographics such as income level and minority could be better isolated from the impact of land value on firms' decision-making. Due to time restrictions and data availability, cross-sectional data is used over all counties in Texas, a state with a large presence of the natural gas industry.

A sample of all Texas counties that had appropriate data was included in this model. This sample of 233 counties only excluded 21 counties due to missing data. The variables included in the final regression model are *Wells, Resource, PopDensity, Minority, Value1997, Income,* and *Education*. Table 1 includes descriptions of these variables and lists their sources and Figure 1 provides the basic statistics on each variable.

Table 1

Variable	Description	Source
Wells	Number of regular producing gas wells as of September 2010	Railroad Commission of Texas
Resource	Gas wells gas production in thousands of cubic feet; measured from January to December 2010	Railroad Commission of Texas
PopDensity	Persons per square mile, 2010	US Census Bureau
Minority	2010 minority population as percentage of total population	US Census Bureau
Value1997	1997 average county market value of acre of land	Texas A&M Institute of Renewable Natural Resources
Income	2009 Median household income	US Census Bureau
Education	2005-2009 percentage of population age 25+ with bachelor's degree or higher	US Census Bureau

Figure1

```
. summarize wells resource income minority popdensity value1997 education

    Variable |       Obs        Mean    Std. Dev.        Min         Max

       wells |       234    432.8162    927.3171          0        6003
    resource |       234    2.85e+07    7.30e+07          0    6.49e+08
      income |       234    41162.29    9592.201      21841       80548
    minority |       234    40.49573    21.43345          6          97
  popdensity |       234    103.5985    309.8335         .1        2718

   value1997 |       233    644.1245    716.5479         30        5899
   education |       233    16.49313    6.356069        6.6        43.1
```

Note that *Wells, Income,* and *Resource* have the largest standard deviations suggesting that these variables vary most about their mean relative to other included variables. Our empirical analysis may find that the variation in *Wells* is best explained by the variation of *Income* and/or *Resource*. These observations are purely speculative.

V. Evidence

As mentioned before, the analysis began with a multiple regression model that was estimated using OLS. This model was first estimated using a random sample of 30 counties in Texas. After the data on all counties in Texas were collected, the regression model was run again with the same specification. Using the Ramsey RESET test, we found that the old model specification no longer fit the data. With both regressions there were heteroscedasticity problems,

which were corrected for by using robust standard errors. The results of these initial regressions are shown in Table 2.

Table 2

Variables	N=30 P-values	N=30 Coefficients	N=233 P-values	N=233 Coefficients
Resource	0.03	$6.49*10^{-6}$	0.00	$8.64*10^{-6}$
Population	0.27	-0.0026	0.07	-0.00039
Minority	0.06	2772.626	0.06	568.54
Income	0.12	0.0758	0.04	0.015
Land	0.28	0.2511	0.11	0.025

After attempting logical model specification changes using OLS regression methods, the model was tested for simultaneity bias using the Hausman Specification Test. In this process, we decided to include slightly different variables reflecting further research. The test results, shown in Figure 2, indicate that the model does have simultaneity bias because the Prob>F value (0.01) is less than 0.05. In other words, the impact of the residuals from running a regression of the reduced form equations is significant in difference from 0. This also means that there is a feedback loop so to correct for this we construct the simultaneous equations discussed above and estimate them using 2SLS. The regression results are shown in Figure 3. Before interpreting the regression results, it is also important to note that the 2SLS model was also tested to see if *Income* was a strong instrumental variable. The Stata output from this test is shown in Figure 4. The OLS regression of the instrumental variable *Income* on all included variables and the identifying variable, *Education*, indicates that *Income* is a good instrument because the Prob>F value (0.00) is less than the 0.05 level of significance so we

can reject the null hypothesis that the coefficients on all included variables are 0. In other words, the Adjusted-R^2 is statistically significant in difference from 0.

Figure 2

```
. regress value resource income popdensity
```

Source	SS	df	MS		Number of obs =	233
					F(3, 229) =	21.81
Model	191255650	3	63751883.3		Prob > F =	0.0000
Residual	669286270	229	2922647.47		R-squared =	0.2223
					Adj R-squared =	0.2121
Total	860541920	232	3709232.41		Root MSE =	1709.6

value	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
resource	5.48e-07	1.59e-06	0.34	0.732	-2.59e-06	3.69e-06
income	.0254878	.0123509	2.06	0.040	.0011519	.0498237
popdensity	2.562794	.3874724	6.61	0.000	1.799327	3.326261
_cons	204.703	510.0005	0.40	0.689	-800.1904	1209.596

```
. predict vres, resid
(1 missing value generated)

. regress logwel resource income value vres
```

Source	SS	df	MS		Number of obs =	233
					F(4, 228) =	20.51
Model	424.679533	4	106.169883		Prob > F =	0.0000
Residual	1180.12922	228	5.17600535		R-squared =	0.2646
					Adj R-squared =	0.2517
Total	1604.80875	232	6.91727911		Root MSE =	2.2751

logwel	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
resource	1.85e-08	2.15e-09	8.62	0.000	1.43e-08	2.28e-08
income	.0000423	.0000184	2.30	0.023	5.99e-06	.0000787
value	-.0005205	.0002012	-2.59	0.010	-.000917	-.0001241
vres	.0006326	.0002196	2.88	0.004	.0001999	.0010653
_cons	2.444742	.6716718	3.64	0.000	1.121265	3.76822

```
. test vres

 ( 1)  vres = 0

       F( 1,  228) =    8.30
            Prob > F =    0.0043
```

Figure 3

```
. ivreg wells resource popdensity minority value1997 (income= popdensity minorit
> y value1997 education)

Instrumental variables (2SLS) regression
```

Source	SS	df	MS
Model	55314333.4	5	11062866.7
Residual	144908993	227	638365.607
Total	200223326	232	863031.578

```
Number of obs =      233
F(  5,   227) =    34.84
Prob > F      =   0.0000
R-squared     =   0.2763
Adj R-squared =   0.2603
Root MSE      =   798.98
```

wells	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
income	-.0451702	.038675	-1.17	0.244	-.1213782	.0310378
resource	9.79e-06	9.12e-07	10.73	0.000	7.99e-06	.0000116
popdensity	-.7137522	.3390545	-2.11	0.036	-1.381849	-.0456557
minority	-3.345217	6.346545	-0.53	0.599	-15.85089	9.160455
value1997	.4811013	.1198733	4.01	0.000	.2448946	.7173079
_cons	1916.833	1743.2	1.10	0.273	-1518.088	5351.755

```
Instrumented:  income
Instruments:   resource popdensity minority value1997 education
```

Figure 4

```
. regress income resource popdensity minority value1997 education
```

Source	SS	df	MS
Model	4.9027e+09	5	980540354
Residual	1.6161e+10	227	71192896.9
Total	2.1063e+10	232	90790902.5

```
Number of obs =      233
F(  5,   227) =    13.77
Prob > F      =   0.0000
R-squared     =   0.2328
Adj R-squared =   0.2159
Root MSE      =   8437.6
```

income	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
resource	.0000132	7.85e-06	1.68	0.095	-2.30e-06	.0000286
popdensity	6.732463	2.319925	2.90	0.004	2.161121	11.30381
minority	-142.6194	26.65511	-5.35	0.000	-195.1425	-90.09638
value1997	.9108222	1.068944	0.85	0.395	-1.195499	3.017144
education	244.3049	99.78071	2.45	0.015	47.6901	440.9198
_cons	41294.8	1974.299	20.92	0.000	37404.5	45185.09

The p-values for *Resource* (0.00)*, PopDensity* (0.04)*, and *Value1997* (0.00) indicate that we can reject the null hypotheses that the coefficients on these variables are 0. In other words, their coefficient estimates are statistically significant in difference from 0. The coefficients on these variables do all have the expected sign. The coefficient on *Resource* is positive, which is logical because if there is more natural gas in a county, there should be more wells to extract it. The coefficients on *PopDensity* and *Value1997* are not as expected. This possibly can be explained by an unaccounted for model specification problem.

Previous literature has found that there is a parabolic relationship between the presence of an undesirable land use site and income. Boer et al. found that "income has first a positive, then a negative effect on TSDF location, a pattern that likely reflects the fact that the poorest communities have little economic activity while wealthier communities have the economic and political power to resist negative environmental externalities." This finding may also apply to *PopDensity* and *Value1997*. Very desolate areas where land is not habitable may correspond with a type of land where shale deposits are also not often found while very populated areas, where water and organic materials are more abundant, are too populated for the construction of a natural gas well. This example, purely speculative, describes a similar situation to that found by Boer et al. A step for further research would be to include a squared term. A similar example could be constructed for *Value1997*. This relationship is not accounted for by the current model and could explain the unexpected sign of the coefficients. The final observation from this regression analysis that is pertinent to our study is that the sign of the coefficient on *Income*, although not significant in difference from 0, has the hypothesized sign. The coefficient is negative suggesting that if income increases, the number of wells in that county will decrease, holding constant the impact of all other variables. The coefficient on *Minority* is also negative, contrary to our hypothesis. The weaknesses of this study are the lack of panel data and the model specification. Further research is needed on this issue to gain better insight into the location of these wells as the natural gas industry continues to grow.

VI. Conclusions

Although the model does not indicant that the impacts of income and minority status on the number of wells in a county are significant, further research is necessary to look at this relationship across time. We believe that analysis using

panel data may find different results or at least offer a more clear interpretation and application of findings. This study suggests that income and the percentage of the population that is a minority are not significant indicators of where natural gas wells are located in Texas counties. These findings challenge claims made by the environmental justice movement. This does not mean, however, that there is any less of a need to do further research on the possible health and environmental impacts of hydraulic fracturing. Further analytical research is needed in on the issue of fracking well location that can address the issues of the best unit of observation (county, census tract, borough, etc) that should be used in the analysis and data limitations. Research is crucial for appropriate policy implementation and public understanding especially as the natural gas industry expands.

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The Staffing of Presidential Assistants: Their Effect on Presidential Success in the House of Representatives
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Abstract

This paper examines the Congressional success of United States Presidents based on the reported Congressional Quarterly Presidential Box Scores. Their individual success is examined as an effect of the senior staff member a President chooses and whether they are chosen from the campaign, personal experience, or previous administrations. It is important for a President to consider the origins of these staffers as these Assistants to the President act as the body of the President's administration. The econometric analysis presented reveals several interesting results. First, the predominance of a President to choose staff members from his campaign shows no significant impact on his Congressional relations and success. Second, staff members chosen from personal experience have a negatively correlated hindrance on success. Finally, those members chosen for their experience in previous administrations has a positive impact on Presidential success. This research is used to supplement the existing, qualitative research on the subject through regression analysis.

I. Introduction

At the beginning of every new Presidential administration, during the transition period, a President is faced with several critical choices, namely: what staff he should pick as his Assistants to the President. Assistants to the President are the senior staffers in the White House. They work with the President daily, they have offices in the White House, and they prepare advice sheets and recommendations for every policy that comes in the President's door. He looks to them for those recommendations. There are also several that work with Congress, acting as a Liaison between the two and a defender of the President's agenda. It is critical that the President picks the right people for the jobs because they could influence his success.

What are the right people for the job? Who should the President hire for those positions? The purpose of this paper is to determine if the types of staff members a President picks as his Assistants influence his success and secondly, what types of staff members provide a positive influence on that success.

This paper aims to provide insight to future Presidents as they choose the people they want for the different Assistant positions. It also provides insight to political pundits as they evaluate the likely success of a President over his four or eight year term. Also, it provides a lens with which to evaluate the past performances and staff choices of Presidents. The findings of this paper may also be significant to gubernatorial success and local elections and perhaps even to other global governments in its determination of ideal staff member backgrounds.

Previous literature has only just begun evaluating the factors that cause political success. Bond and Fleischer (1990) and Covington, et al (1995) are just a few of the papers that have begun exploring this topic. Their previous work laid the foundation for this paper to explore the possibility of Assistants to the President influencing presidential success, specifically in the legislative arena of the House of Representatives.

In the next section, I will describe the previous literature on the topic, including papers that postulated and laid the framework for my study but did not provide any empirical background. Being that this is a novel study, I will also describe similar studies in the field of presidential legislative success and the variables they tested. In section three, I will present the entity-demeaned OLS equation being used to model this data and will discuss the relevant variables. In section four I will discuss and make observations about the data collected to test my hypothesis, and in section five, I will perform an empirical analysis of my hypothesis using the collected data to validate or negate previous literature that based their conclusions on assumptions. Finally, I will conclude and summarize my findings.

II. Literature Review

This paper will attempt to add statistical evidence to the current theoretic literature on the effect of a President's senior staff on the success of the administration. Most current papers on the topic are observational and base their conclusions on several assumptions. They do not justify their conclusions with any concrete data. In this paper, I will attempt to explain the success of a Presidential legislative success with the type of senior staff members in the administration.

For example, Carey examines Presidential staffing in the sixties and seventies and critiques the Johnson and Nixon administrations for their choices in senior officials – namely assistants to the President (1969). They suggest that more experienced staffers, who have engaged in the framework of staffing work, will better aid the President in completing his work. Carey's paper does not specifically focus on Presidential "success" but he does comment on Presidential "effectiveness" and "efficiency." Again, this paper is merely critical commentary and does not provide any statistical evidence.

Hoxie continued evaluating presidential staff choices for the Ford and Carter administrations, concluding that a President should select as his aides, men "whose goals and experience involve service to more than a single politician" (1980). Hoxie also concludes that "emotional dependency by a President" on his aides, "should be avoided as far as possible. The argument is that staff members with prior experience have a positive relationship with the success of a relationship and staff members with personal relationships to the President have a negative relationship. Hoxie's paper adds no empirical support to these conclusions. The focus of this paper is to make "relationship" and "past experience" variables in the model evaluating presidential success.

King and Riddlesperger modernize this argument in their evaluation of the Clinton staffing choices (1996). They argue most definitively that a President's

success in office is contingent upon the performance of the staffers he chooses for administrative positions. King and Riddlesperger also provide the last variable that this paper will test, staff that came from the campaign. Those involved on a Presidential campaign will often be given a job in the administrations; this is known as riding the President's coattails. King mentions the prevalence of staffers from the campaign but does not argue their directional effect on presidential success.

As noted, the current literature on this topic does not provide any empirical data on the topic so this paper is novel. This paper will either add credence or help negate the previously mentioned work on this subject. It will be the statistical backing to their assumptions and conclusions.[1]

After I had researched the historical commentary on this issue, I reference past work on many closely related subjects to determine pertinent control variables for the model and help define the dependent variable. Only recently has the presidency been evaluated statistically: Bond and Fleischer (1990), Covington et al (1995), Durham et al (2003) all test various political variables on the success of the president. In these papers, roll call votes, compiled by *Congressional Quarterly*, are used as numerical indicators of Presidential success in Congress. Freund concedes that measuring Presidential success as the relationship between the President and Congress is only perspective of "success" (2004). However, for the purpose of this paper, that perspective will be used as the indicator of success.

Vital Statistics on the Presidency is a publication by *Congressional Quarterly* that documents the success rate of Presidents from Eisenhower to George W. Bush. The rate is measured as the number of bills that pass that a

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1 David E. Lewis wrote *The Politics of Presidential Appointments* (2008) that performs statistical analysis and regressions of staff characteristics on the success of Presidential administrations; however, it focuses on the bureaucracy, and not senior officials (Assistants to the President). While it was referenced for ideas, it was not heavily used in determining theory, model specification or past works.

President supports in addition to the number of bills that fail that a President does not support divided by the total number of bills that the President takes a position on (2008). This paper will use those same figures.

Rivers and Rose conducted a probability study of individual bills supported by Presidential administrations, passing in the House of Representatives (1985). Using a sample of over 400 bills from 1954 to 1972, they tested for the effect of Presidential public opinion on the passing of presidentially backed bills. Their results suggest that popularity is barely significant at the 10% level. The study failed to control for the differing types of bills; they concluded that a bill on the economy is equal to a bill on foreign affairs. With such a specific dependent variable, that lack of clarity likely skewed their data.

Ostrom and Simon conducted a sample of Presidential legislative success yearly from 1953 to 1980 and found public approval to be statistically significant and positively correlated with success rates (1985). This much more exhaustive study controls for several more factors than Rivers and Rose and evaluates success overall rather than on individual bills. Ostrom and Simon provide public opinion as a control for this paper.

Edwards, Barrett and Peake had a sample of 638 pieces of "significant" legislation that failed to pass and evaluated that failure as a result of divided government (1997). Divided government had a t-statistic of 4.00 and was positively correlated with the failure of presidentially supported bills in Congress. This led them to conclude that the party controlling Congress is significant in determining the success rate of the President.

This paper will add to the literature that has regressed different explanatory variables on legislative presidential success, while remaining completely unique on the explanatory variables being tested. Previous regressions will also be used as references for which to base control variables in this model

on. With the amount of literature being written on this subject already, this should be a powerful addition. Finally, the statistical findings of this paper will help to refute some of the generalized commentary on presidential staffing.

III. Modeling

The goal is to see if presidential legislative success is significantly affected by the type of staff members a President chooses as his Assistants. Specifically, those members that served in previous administrations should positively influence legislative success while those that worked on the campaign and have a personal relationship with the President should negatively influence legislative success.

This hypothesis will be modeled using an entity-demeaned OLS regression that averages the data for each administration from Gerald Ford to George W. Bush, differentiating between first and second terms. The reason is to eliminate any unobservable administration-specific – or term-specific – characteristics that pertain to their success in the House of Representatives. For example, Reagan may have had a better repertoire with members of the House of Representatives that led to higher success rates. By averaging each President's success and deviating their individual successes from that mean, President specific variables should be accounted for. The estimated model is:

$$SucRate_t = \beta_0 + \beta_1{}^*Approval_t + \beta_2{}^*Party_t + \beta_3{}^*Padmin_t + \beta_4{}^*Relate_t + \beta_5{}^*Campaign_t + e_t \quad (1)$$

The dependent variable is a President's legislative success rate in the House of Representatives, measured annually. This variable, $SucRate_t$, is a function of the bills that the President supported, that passed, and the bills that the President opposed, that did not pass. I control for the effects of presidential public approval and the majority party in the House of Representatives.

Presidential public approval, as referenced in Ostrom and Simon (1985), reflects the constituency's support of the President's agenda. The logic is that House Representatives should largely vote similar to their constituency. Therefore, the coefficient on *Approval*, β_1 should be positive – the greater constituent approval, the greater the presidential influence in Congress. The effect of political party in the House of Representatives is a dummy variable that takes the value of "1" if the House majority is the same party as the President and "0" if the House majority is the opposite party of the President. As previously explained, if the House is the same political party as the President, the House will likely agree with and pass more of the President's supported legislation. The coefficient on *Party,* β_2 should be positive also.

The variables measuring staff background – previous relationship to the President, previous administration positions, and campaign work – are more difficult to measure in the model. The Assistants to the President that also served in previous administrations, the variable *Padmin$_t$*, are measured as a percentage of the Assistants in any given year that have served under any previous President. Hoxie suggests that previous administrative experience will aid the success of the current President.[2] As a result, the coefficient estimate on *Padmin$_t$*, β_3 is conjectured to be positive.

The Assistants to the President that were notably chosen for their position because of their involvement in the Presidential campaign – either the initial or, when appropriate, re-election, denoted by the variable *Campaign$_t$*, are measured as a percentage of the Assistants in any given year that were involved in that President's campaign. However, while campaign mentality is productive and efficient in the eventual succession of the candidate to the Presidency, that mentality becomes an inhibitor. The campaign mentality is idealistic and different

2 As noted above, Hoxie (1980).

from the necessary productivity needed for legislative affairs and Congressional communications. Therefore, I posit that the coefficient estimate on *Campaign*, β_4 will be negative.

Finally, there are the Assistants to the President that have had a longstanding relationship with the President – likely a long term acquaintance or friendship – is measured by the variable *Relate*. It is measured as the percentage of the Assistants that are chosen based on their personal affiliation with the President. While friendships are key to the successful President, long term friendships and personal relations could lead to bias in the President's judgment. Again I speculate that the coefficient on *Relate*, β_5 is negative.

In the data section I will explain the specific data sets used to describe presidential success rates and the control variables but I will now briefly explain how the characteristic variables were measured.

The White House, every year, produces *The White House Government Manual*, which lists the Assistants to the President in the White House Office (WHO). A large portion of those Assistants have profiles in *Who's Who in American Politics*, the autobiographies of the Presidents themselves, or in historic reports on the individual Presidents and their staff. *Congressional Quarterly* has been combining that data for their research guide to the evolution of the White House Staff from George Washington to Barack Obama. Fortunately, I have been part of that data collection. Every Assistant to the President listed in the Government Manual for each year can be demarcated as being from a previous administration (P), having a personal repertoire with the President (R), being selected from the campaign (C), or being from none of these categories (N). Once the total Assistants to the President have been tabulated and denoted with one or multiple of these tags, they were then converted into percent form. The labels – P, R or C – are then transformed into percentages of the total Assistants to the

President for every year.[3] Those percentages were then used as the annual values to compare with the President's legislative success rates.

IV. Data

This paper focuses on the period from 1974 when the Ford Presidency began to 2008, the end of the Bush Presidency. *CQ Press* had compiled *Presidential Success Scores* during that time that serve as the data set reflecting the dependent variable in this study. Ideally, a variable would be created that composited several administrative factors into the category of "Presidential Success." However, this paper is focusing solely on Presidential success in the legislative arena, particularly the House of Representatives. As mentioned, *CQ* compiles this data as the percentage of bills where the decision of Congress reflected the position of the President.[4]

The control variables include presidential public approval ratings and whether the House of Representatives was the same political party as the President in any given year. Previously written, the party variable is a dummy variable. The public approval variable is an annual average of bi-weekly Gallup-Poll results on the popularity of the President.

The data set on the staffing variables was generated – mentioned above – from intensive research on the individual Assistants to the President and their connection (be it campaign, relationship, or previous administration) to the President. The amount of work that went into investigating the backgrounds of these individuals attests to the accuracy of the data set. Previous literature, including King and Riddlesperger (1996), has included variables such as "relationship to the President" but they use estimates of the percentage of staffers that are "friends" with the President over the course of their term rather than a year by year analysis of the men that served in the senior staffing level positions.

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3 That is labeled "Table 1: Assistant to the President Labels" and is located in the Appendix.
4 That is labeled "Table 2: Presidential Success Scores in the House of Representatives" and is located in the Appendix.

Before describing the data, it is important to note that the Ford Presidency did not have any staffers from the campaign simply because Ford did not have a campaign. Once Nixon resigned, Ford assumed the role of the Presidency, with many of Nixon's previous administration. He did not get to choose his own people. This could bias the data so a separate regression will be run excluding the data from 1974 through 1976 to see if any significant changes can be seen.

Before I continue, it is significant to note that from 1974 to 2008, the number of Assistants to the President grew from 10 to 17 reaching record highs of 27 during the Clinton administration. As the number of Assistants grows so does the number of people demanding the President's attention and giving him advice. This could affect the receptiveness of the President and the number of Assistants that are actually influencing the President may be difficult to account for. It is the hope in this paper that by using the entity-demeaned OLS regression some of these unknown and uncontrollable factors will be reduced to a minimum so as to get the most accurate results.

Figure 1: Variable Summary Statistics

Variable	N	Mean	Std. Deviation	Min	Max
$SucRate_t$	35	55.19%	20.79	15.4%	87.3%
$Approval_t$	35	51.63%	11.69	26.0%	73.3%
$Padmin_t$	35	23.6%	24.3	0.0%	92.0%
$Relate_t$	35	25.6%	16.2	0.0%	63.0%
$Campaign_t$	35	44.5%	24.5	0.0%	100.0%

Figure 1 depicts the summary statistics of the included variables except for $Party_t$ because that is a dummy variable. The statistics provide insight into the evolution of staff through these recent administrations. In 1978, 100% of

the Assistants to the President came from the campaign. President Carter was dedicated to choosing those that had served him during the campaign. He was a strong advocate of rewarding his staff.

In 1989, there was a 92% high of senior staff members that had come from past administrations. When George H.W. Bush won election, the Reagan era continued and he continued the previous administration with many of the same Assistant staff.

Figure 2: Presidential Legislative Success Rates in the House of Representatives
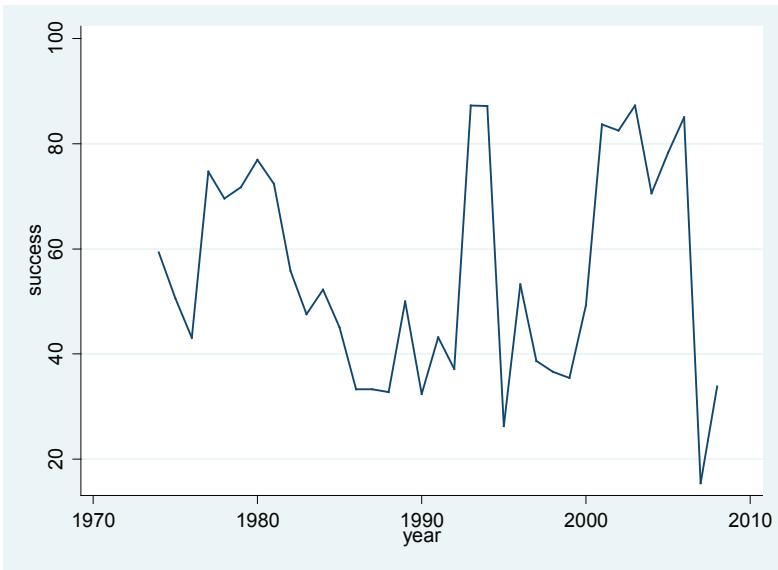
It is also noteworthy that at different times throughout the time period in the study a President purged his staff of all those from a certain background. It is clear that as directives changed in each administration, the types of senior staffers were adjusted. Backgrounds were scrutinized and removed to help the President succeed and receive good advice.

Interestingly, the legislative success rate of the President, on average for every administration, is around 50%. The President will typically succeed half of

the time and fail half of the time. This observation demands the answer as to how a President can succeed more than 50% of the time. In fact, a successful President could be evaluated as one who is above that threshold while a weak President is evaluated as one below it.

The success over time graph is also shown in Figure 2. During the first year it is typical that the President will have greater success than his later years because of the "Honeymoon" period that Congress grants him. Most of that fluctuation can be explained by the same political party as the President being in power during those years; however, it is noteworthy that the success rates of both Clinton and George W. Bush reached record heights in the early portion of their presidency as they both supported military fund allocations.

Figure 3 depicts the three staff measures against time. Past administration experience over time mirrors the graph of presidential success over time. Relationship to the president

Figure 1: Staff % on campaign, relationship, previous administration over time
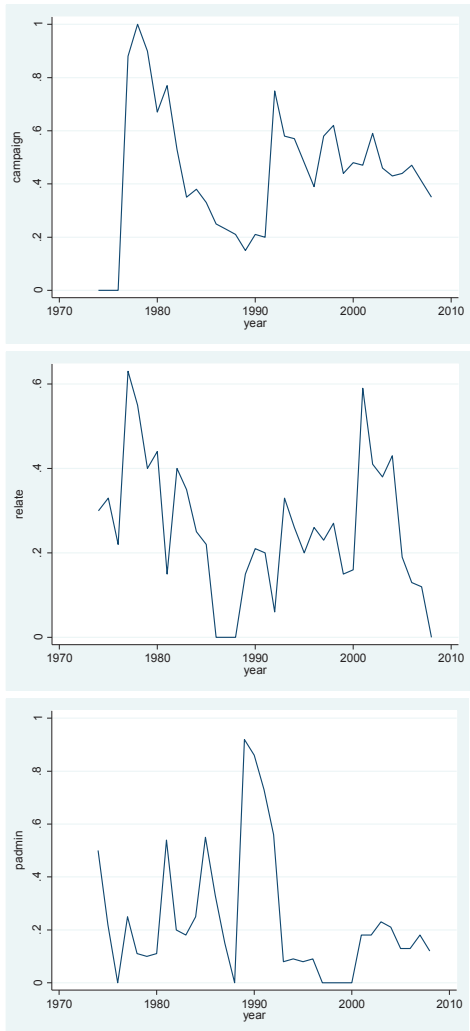
seems to be the inverse to the graph of presidential success over time. Finally, campaign involvement also seems to inversely mirror presidential success, although not as definitively.

V. Empirical Evidence

The table below shows the OLS regression results. Regression (1)[5] was not entity-demeaned so that it could be compared to Regression (2) that is entity-demeaned. The variation between the two regressions shows the necessity of using entity-demeaned OLS because it controls for administration specific variables.

Figure 4: OLS results for the legislative success of the President

	(1)	(2)
Popularity	.123	.024
	(0.69)	(0.15)
Party	36.12	46.92
	(6.66)***	(8.35)***
Padmin	6.92	26.89
	(0.82)	(2.04)**
Relate	15.80	11.12
	(1.01)	(0.73)
Campaign	-4.54	18.93
	(0.49)	(1.62)
Entity Demeaned	No	Yes
Observations	35	35
Adj-R-squared	0.73	0.83
Durbin Watson Stat	1.81	2.28
Serial Correlation	Possible	Possible

Note: T-statistics are in parentheses. *, **, and *** denote level
of significance indicating 10%, 5%, and 1% respectively.

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5 This was my first regression performed; it was not until later that I realized I should account for administration specific variables by using entity-demeaned OLS. That is why it is included.

Both of these regressions included the data from 1974 to 1976 because I first noticed the possibility of serial correlation, being that this data set is a time trend. The Durbin-Watson statistic for both regressions falls within the uncertain region of the critical Durbin-Watson statistic values. This led me to evaluate the residuals against the lagged residuals (provided in Figure 5). Aside from a few outliers, there is an upward sloping pattern in the residuals. I attempted to correct for this serial correlation with a time trend and by weighting using the Prais-Winsten method of Generalized Least Squared. However, the Durbin-Watson statistic remained in the uncertain region.

Figure 5: Residuals vs. Lagged Residuals, Regression (2)
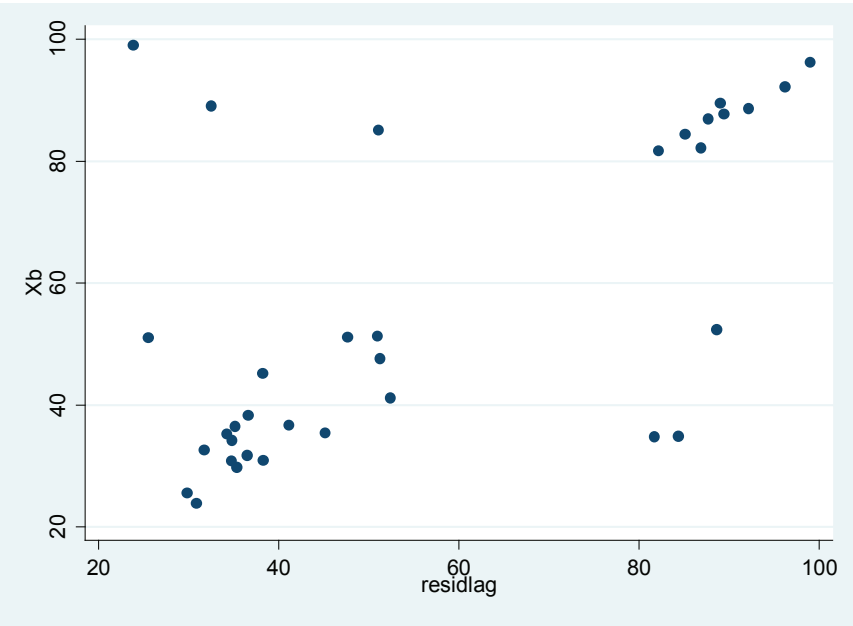
I corrected for the presence of autocorrelation using first differences – the variable minus the one period lag of that variable. Those results, entity-demeaned, are provided in the table below. Regression (3) is the first difference

OLS including the 1974-1976 time period and Regression (4) is the first difference OLS excluding the 1974-1976 time period.

Again, the serial correlation was removed in Regression (3) – see Figure 7 – while it is still inconclusive as to the serial correlation in Regression (4). The Durbin-Watson statistic for Regression (3) is above the upper critical statistic while the statistic for Regression (4) is at the edge of the upper statistic.

Looking at both regressions numbered (3) and (4) we see that the popularity coefficient, even differenced, remains statistically insignificant. We cannot reject the null hypothesis that β_1 is zero at even the 10% level of significance. Also important to both regressions, the political party variable coefficient, β_2, is statistically significant in difference from zero at the 1 percent level of significance. This significance was also seen in regressions numbered (1) and (2) even prior to the first differences.

Figure 2: OLS results (serial correlation corrected) for the legislative success of the President

1st Difference	(3)	(4)
Popularity	.172	.186
	(0.70)	(0.73)
Party	77.92	77.86
	(7.19)***	(11.29)***
Padmin	8.25	8.01
	(1.77)*	(1.95)*
Relate	-8.58	-9.54
	(1.77)*	(1.75)*
Campaign	-7.47	-7.32
	(0.56)	(0.41)
Entity Demeaned	Yes	Yes
Observations	29	27
Adj-R-squared	0.71	0.71
Durbin Watson stat	2.34	1.97
Serial Correlation	No	Possibly

Note: T-statistics are in parentheses. *, **, and *** denote level of significance indicating 10%, 5%, and 1% respectively.

Focusing on Regression (3), we see that the coefficient on percentage of Assistants that served in previous administrations is statistically significant in difference from zero at the 10% level. As expected, the coefficient estimate is positive. As a President adds staff members with previous experience, their predicted legislative success is likely to rise. This makes sense because former administration officials have already experienced the White House. They know how it functions and how to perform best. Also, the coefficient on the percentage of Assistants with a previous relationship to the President is statistically significant in difference from zero at the ten percent level. Again, as expected by this paper's hypothesis, the coefficient estimate is negative. As assumed, and argued by Hoxie, a relationship to the President deters that President's success because they bias the President's judgment.

In both Regression (3) and (4), the coefficient on the percentage of Assistants that originated from the campaign is not statistically significant in difference from zero. Multicollinearity between *Campaign* and *Relate* was tested but found to be minimal. It may just not be as important to determining presidential success as suggested by previous literature or my hypothesis.

Using Regression (4) without the 1974-1976 time period, there are a few slight differences. The coefficients on *Party, Padmin,* and *Relate* are largely to the same magnitude and have largely the same t-statistics.

The Adjusted R-squared value in both is around 0.71 indicating that 71% of the variation in presidential legislative success scores is explained by the variation in the included variables. The Probability>F value is also 0.000 for both regressions indicating that a relationship does exist and that the R-squared value is statistically significant in difference from zero.

This paper's hypothesis suggested that the type of Assistants a President picks for his senior staff influences his legislative success and that testable

characteristics were Assistants from the campaign, from past administrations, and with personal connections to the President. The results have shown that Assistants to the President from past administrations and with relationships do matter while there is not enough evidence to suggest such a relationship in those from the campaign. Those from past administrations have a positive influence while those with personal connections have a negative influence.

VI. Conclusions

The background of people chosen for Presidential Assistants is more than important to the later success of that President. This staffing influence can be witnessed historically and this paper has finally yielded empirical data on the subject. A great amount of literature exists on the topic but only insofar as it assumes conclusions without ever testing them. The reorganization of the Executive Office of the President under the Nixon administration led many political writers to examine the effect of staffers on the President's administration. In the 1970s and 1980s, the universal conclusion was that the President should choose staffers with prior experience while avoiding those people from the campaign and those with a close personal repertoire with the President. While those positions were logically argued, they were never empirically argued.

This paper aimed to test that hypothesis and add reasonable credibility to the previous literature. Using the prior models of presidential success as a function of legislative success in roll call votes, this paper tested the effect of Assistants to the President on that success. The effect of Assistants to the President was tested using three different characteristics: the percentage of the staff in each year that came from the campaign, the percentage that had a personal relationship with the President, and the percentage that had worked in a previous administration. Controls were then added to account for presidential public approval and the majority party in the House of Representatives.

After correcting for autocorrelation in the time series and using entity-demeaned OLS to account for the immeasurable differences brought by different administrations, I found that the type of staff chosen is significantly correlated with presidential legislative success. The percentage of staff that had experience from prior administrations is statistically significant and positively correlated. The percentage of staff that had a relationship with the President is statistically significant and negatively correlated. The percentage of the staff from the campaign is negatively correlated but the coefficient is not statistically significant. These results are aligned with the previous speculative literature and the control variables are aligned with previous studies on their respective influence.

A further study could, as done by Rivers and Rose (1985), could examine the effect of staff on the passing of individual roll call bills in the same time period – 1974 to 2008 – to test their effects. This paper performed a regression on the annual averages of public approval and staff percentages but individual bills could be regressed in a snapshot of time, so as to confound the results with annual averages. This study could also test for the differences of Assistant influence for different bills – be it domestic, economic or foreign affairs. By differentiating presidential legislative success into those three categories, we could get a much more specific depiction of Assistant influence.

This paper's findings are significant for media pundits, political advisors and Presidents in the choosing of their staff. While a President may want to choose those from the campaign or personal friends, this research suggests that they could be a detriment to his legislative agenda. A President should look for experience. On the same token, pundits and advisors can evaluate a President based on the staff he has chosen and be able to cite these findings as evidence rather than using the mere speculation of the past literature. Of course, this study alone should not be the only criterion that a President uses. This statistical evaluation should just another tool.

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Appendix

Table 1: Assistant to the President Labels

Year	P (% P)		R (% R)		C (% C)		Total Assistants
1974	5	(50)	3	(30)	0	(0)	10
1975	2	(22)	3	(33)	0	(0)	9
1976	0	(0)	2	(22)	0	(0)	9
1977	2	(25)	5	(63)	7	(88)	8
1978	1	(11)	5	(55)	9	(100)	9
1979	1	(10)	4	(40)	9	(90)	10
1980	1	(11)	4	(44)	6	(67)	9
1981	7	(54)	2	(15)	10	(77)	13
1982	3	(20)	6	(40)	8	(53)	15
1983	3	(18)	6	(35)	6	(35)	17
1984	4	(25)	4	(25)	6	(38)	16
1985	5	(55)	2	(22)	3	(33)	9
1986	4	(33)	0	(0)	3	(25)	12
1987	2	(15)	0	(0)	3	(23)	13
1988	0	(0)	0	(0)	3	(21)	21
1989	12	(92)	2	(15)	2	(15)	13
1990	12	(86)	3	(21)	3	(21)	14
1991	11	(73)	3	(20)	3	(20)	15
1992	9	(56)	1	(06)	5	(75)	16
1993	1	(08)	4	(33)	7	(58)	12
1994	2	(09)	6	(26)	13	(57)	23
1995	2	(08)	5	(20)	12	(48)	25
1996	2	(09)	6	(26)	9	(39)	23
1997	0	(0)	6	(23)	15	(58)	26
1998	0	(0)	7	(27)	16	(62)	26
1999	0	(0)	4	(15)	12	(44)	27
2000	0	(0)	4	(16)	12	(48)	25
2001	3	(18)	10	(59)	8	(47)	17
2002	3	(18)	7	(41)	10	(59)	17
2003	3	(23)	5	(38)	6	(46)	13
2004	3	(21)	6	(43)	6	(43)	14
2005	2	(13)	3	(19)	7	(44)	16
2006	2	(13)	2	(13)	7	(44)	16
2007	3	(18)	2	(12)	7	(41)	17
2008	2	(12)	0	(0)	6	(35)	17

Table 2: Presidential Success Scores in the House of Representatives

Year	SucRate
1974	59.3
1975	50.6
1976	43.1
1977	74.7
1978	69.6
1979	71.7
1980	76.9
1981	72.4
1982	55.8
1983	47.6
1984	52.2
1985	45
1986	33.3
1987	33.3
1988	32.7
1989	50
1990	32.4
1991	43.2
1992	37.1
1993	87.3
1994	87.2
1995	26.3
1996	53.2
1997	38.7
1998	36.6
1999	35.4
2000	49.3
2001	83.7
2002	82.5
2003	87.3
2004	70.6
2005	78.3
2006	85
2007	15.4
2008	33.8

The Rise of American Industrial and Financial Corporations
Elizabeth Laughlin

Abstract

This paper identifies and analyzes the steps the United States took in its progression to an industrial nation. Launched by the merger movement in the late nineteenth century, vertical and horizontal integration lead to trusts and monopolies in a number of industries. Simultaneously, the labor market was undergoing a number of reforms with the deskilling of workers. The rise of big business was made possible through the growth of the financial sectors and companies such as J.P Morgan. The case study of The Standard Oil Co. highlights the wealth and power that robber barons such as J.D. Rockefeller held during this time period and its continuing affects, including a widening of the distribution of wealth and inequality.

I. Introduction

In the nineteenth century, the American economy underwent a period of rapid expansion and change as a previously agricultural nation shifted into an industrial one. Following the Civil War, there was an accumulation surge due to new technological advances and managerial reforms that allowed for greater control over workers, price, and output. Mass production of goods soared, as well as a shift that occurred in the labor markets, moving from proletarianization into homogenization. The rise of big business and corporate finance occurred simultaneously and in turn, stimulated the economic growth at the time. This growth, however, was concentrated in the monopolistic fortunes of the robber barons. While a great deal of innovation and progress was seen with the rise of the American industrial and financial markets, it also left the nation with rising inequality and wage gaps that are still seen today.

II. The Merger Movement

While the majority of businesses industrialized in the 1870s, one industry was ahead of its competitors. According to Alfred Chandler, author of *The Visible Hand: The Managerial Revolution in American Business* (1977), America's first

big business appeared in the 1850s with the railway system. At the time, only major governmental organizations, such as the United States Post Office, were employing more workers and controlling more money than the railroads. Chandler further explains, "The great railway systems were by the 1890s the largest business enterprises in the United States but also in the world… The railroad was, therefore, in every way the pioneer in modern business administration" (1977, p. 204).

The change that the American railroads underwent forecasted what was to come for the rest of American business. Expanding to unprecedented levels in the 1850s, the railroads were responsible for 15 percent of gross private investment in the economy during that period, increasing to 28 percent by the 1890s (DuBoff, 1989). Richard Tedlow, author of *The Rise of the American Business Corporation* (1991), explains, "… the railroad was critical to American economic growth, and the corporate form was critical to the growth of the railroad" (p. 15). This corporate form that allowed for railroads to expand into big business was facilitated through a surge of consolidations. Successful companies, such as W. H. Vanderbilt's New York Central Railroad, began to buy, lease, or form trusts with competitors and led to industrial giants, not only within the railroad sector but extending throughout all industries (DuBoff, 1989).

The consolidation movement was discussed above with respect to the railroad system, however, the merger movement occurred throughout all industries in the late nineteenth century. According to DuBoff, "… all those forces making for big business coalesced in a tidal wave of mergers and consolidations" (1989, p. 57), focusing largely on Alfred Chandler's views on the managerial revolution and technology as those main forces. Chandler believes that big business was a result of inefficiency faced by many industries in the wake of expanding markets and new technology (1977). In order to combat this inefficiency, Chandler asserts

that the "visible hand" of management allowed for greater control and supervision of employees and output. In his book, *The Visible Hand*, he explains,

> In many sectors of the economy the visible hand of management replaced what Adam Smith referred to as the invisible hand of market forces. The market remained the generator of demand for goods and services, but the modern business through existing processes of production and distribution, and of allocating funds and personnel for future production and distribution. As modern business enterprise acquired functions hitherto carried out by the market, it became the most powerful institution in the American economy and its managers the most influential group of economic decision makers (Chandler, 1977, p. 1).

Chandler's argument rests on the belief that progress and innovation with respect to production and larger markets allowed for this change in management (1977). Prior to the industrial revolution, corporations simply did not operate at such a level that they demanded hierarchical administrators. However, once the markets for goods and services expanded, this control over production and workers was required. Corporations could no longer depend on market control to ensure its efficiency. Instead, firms began to account for external market expansion and grow internally through horizontal and vertical integration (ibid).

The merger movement saw a great deal of horizontal integration, as one organization combined with its less successful competition to turn themselves into large multi-unit companies. Within horizontally integrated businesses, managerial power existed over the various departments, each with their own head (DuBoff, 1989). By acquiring the competition, these large-scale companies were able to control prices and output over the entire market, as if it was a true monopoly (Cashman, 1984).

As horizontal integration allowed for a greater distribution of power, vertical integration involves a top-to-bottom accumulation of power. Vertical integration allowed for greater production efficiency due to its ability to reduce costs (Cashman, 1984). Chandler explicates that the first successful big businesses

in the United States were those that implemented a higher level of management, responsible for connecting the production and the distribution of goods. In many firms, the corporate manager facilitated "the flow from the suppliers of raw materials through all the processes of production and distribution to the retailer or ultimate consumer" (Chandler, 283). Whether horizontally or vertically integrated, the internalization of management led to lowered transaction costs, increased production and more competitive prices (ibid.).

Innovations such as horizontal and vertical innovation cause the Gilded Age to often be remembered as a time of continuous prosperity and growth. However, in many industries, such as oil and steel, this is not the case (Cashman, 1984). Demand was always changing while excess capacity was a constant fixture since 1873. Accumulation can only continue as long as capacity does not outstrip demand, a problem that is often inherent to a capitalist economy, causing firms to grow too large for their own markets, forcing companies to drop their prices in order to produce some profits. Eventually, the entire market must drop their prices as well. This cycle is known as destructive competition (DuBoff, 1989).

This problem of destructive competition was rampant in the late 1800s, leaving many firms in a trapped, diminishing market. In hopes of combating destructive competition, corporations sought to establish greater control over production, prices, and profits through a number of agreements. Informal agreements such as gentlemen's agreements quickly lead to cartels and eventually, trusts. Since trusts did not require a state charter, larger corporations were able to force smaller firms to secede control, simply issuing trust agreements entitling them to a percentage of profits (Prechel, 2000). As seen with the Standard Oil Company, trusts were formed between firms to maximize control and expansion, with hopes of eventually monopolizing. The Standard Oil Trust established by Rockefeller gave trustees control of more than 90% of the oil industry. Growing

wary of the power and size of companies such as Standard Oil, the federal government implemented the Sherman Anti-Trust Act in 1890 in order to restrict monopolies (ibid.). However, the Standard Oil Company, along with a handful of other trusts of the period, survived as either a monopoly or oligopoly within their respective industries well into the twentieth century (DuBoff, 1989).

The holding company of the late nineteenth century was critical in the development of the modern corporation, providing the foundation for growth. Harland Prechel's book *Big Business and the State* focuses on the rise of corporations and their legacy between the 1880s and the 1990s. However, he addresses that the expansion of business corporations began as early as the first half of the nineteenth century due to factors such as an increase in foreign demand markets following the Napoleonic Wars and the introduction of canal and railway transportation. He explains, "As the number of business enterprises increased, the demand for business charters (i.e., certificates of incorporation) increased. These charters focused on corporations' capital structure and attempted to ensure the rights of the public, creditors, and shareholders" (Prechel, 2000, p. 26).

Working together, forces, such as the managerial revolution, integration, and technological advancements, provoked the merger movement of the late nineteenth century. As described above with respect to the railroad companies, a wave of consolidations overtook many industries during this time period. According to DuBoff, over 2,653 large-scale businesses vanished in just four years, from 1898 until 1902 (1989). A capitalist economy inspires natural competition within industries, which comes with gains and losses. As the century wore on, competition within industries steepened as new technologies and labor processes were introduced, forcing holding companies to merge with their more efficient competitors, leading to industry monopolies and the rise of big business (ibid.).

For the robber barons of the Gilded Age, the merger movement was clearly beneficial as they gained greater market control. However, Chandler argues that such mergers were rarely profitable until a middle management was added (Chandler, 1977). Their prime responsibility was to plan and oversee the increased number of operations within the newly merged company. Capitalists such as Cornelius Vanderbilt or Andrew Carnegie remained as figureheads for the company, but the day-to-day operations were left to a new level of middle management. This development of the multidivisional structure essentially ended entrepreneurial capitalism, while this new branch of management that resulted from labor reform reshaped production and distribution processes, ensuring the dominance of their company (Chandler, 1977).

III. Labor Reform

While companies were changing due to external markets, innovation was also needed within the organization. Much of Chandler's argument on the rise of big business as discussed above relies on correcting the inefficient management and labor techniques. Vertical and horizontal integration led to new managerial hierarchy, which in turn created greater control and less autonomy for workers. These managers, however, were the ones responsible for the shift within the labor markets in the 1870s. During proletarianization, skilled workers and artisans held a great deal of power over the organization. Attempts by management to cut costs by reducing wages were unsuccessful because of this bargaining power. In order to combat this and return the power to the executives, many corporations turned to technology (Gordon et. al, 1982).

The introduction of technology during the late nineteenth century helped to increase short-run efficiency of production by lowering costs and increasing output. However, this was not its primary goal. New technologies were introduced because it lessened the dependence on skilled labor for administrators. At the

time, "… workers were being transformed into appendages of machinery itself, which was assuming almost-human attributes as it 'takes the place of a mere implement'" (DuBoff, 1989, p. 37). This magnifies the division of labor that occurred within the homogenization of the 1870s. Technology helped to deskill the labor, which in turn lessened workers' bargaining power, restoring it to the hierarchical management.

Similar to how investment led to greater market instability, homogenization led to great labor instability. Employers adopted a divide-and-conquer strategy within the workplace to encourage competition between workers and weaken their unity. Through vertical and horizontal integration, employers sought to divide workers through task variability and new job ladders (Gordon et. al, 1982). While unions were productive outlets for negotiations within proletarianization, technology made unionization and bargaining power obsolete. This had a direct result on the workforce, in which "… the union's prime weapon, the ability to withhold the worker's labor at peak spring production rushes, had declined because the introduction of machinery made the molders' skill obsolete" (Gordon et al., 1982, p. 116).

The wave of immigration that occurred in the United States from in the latter half of the eighteenth century furthered homogenization. With various unskilled, ethnically diverse workers flooding American industrial cities, employers found their ideal work group. Manipulating ethnic differences, mangers forestalled assimilation into the workplace and amongst employees. Large industrial firms quickly realized that by exacerbating ethnic and cultural divides they could successfully fracture unionization. Without unions to bargain wages and hours, the labor force essentially lost its control over its employers and was replaced by a culturally divided and unassimilated set of unskilled workers (Gordon et. al., 1982).

As mentioned above, the wave of consolidations simultaneously led to the development of a new level of administration in the form of middle managers. While the emergence of financial corporation facilitated a great portion of mergers, many industrial corporations grew large enough to require middle managers. Responsible for the day-by-day production, these men oversaw market expansion by inventing new techniques to increase production and distribution. For those firms in an oligopolistic market, they also sought to destroy their competition. At this level, competition was occurring at each stage of production. Therefore, "the success of a firm depended primarily on the caliber of its managerial hierarchy. Such quality in turn reflected the ability of the top executives to select and evaluate their middle managers, to coordinate their work, and to plan and allocate resources for the enterprises as a whole" (Chandler, 1977, p. 413). It is clear for one to see how the not only the rise of middle managers, but also homogenization, shifted the labor power from the workers themselves to the executive management.

As worker control enlarged in the latter part of the century, cost controls were similarly increasing. The implementation of product cost accounting, which measured a firm's cost of materials, labor, and overhead, left capitalists with the proper information to evaluate and minimize production costs (Prechel, 2000). More specifically, as quoted by Prechel, "…(1) it compared total product costs to market prices for each product, and (2) it directed mangers' attention toward shop-floor activities to identify and reduce production costs" (Prechel, 2000, p. 97). Although these changes were occurring in the early nineteenth century, the expansion of industry and the managerial revolution furthered the importance of product cost accounting and laid the foundation for corporate finance (ibid).

IV. The Rise of the Financial Markets

It is clear to see the influence that the railroads had, especially with respect to investment. Investment quickly became the driving force of economic

expansion. DuBoff explains, "… capitalism was evolving toward a strong dependence on private autonomous investment as the prime mover of the economy and investment was becoming the engine of growth and instability" (1989, p. 42). The amount of capital witnessed in the latter nineteenth century was unprecedented. While the accounting procedures in place at many large corporations were effective in the early stages, production soon grew to be managed without formal financial guidance (Prechel, 2000). Private investment banks and the stock market became the primary resources that facilitated the role (ibid). In his book *Socializing Capital*, William G. Roy focuses of the reflexivity within the relationship between the growth of industry and financial capital markets. Citing what many economists refer to as American's first big business, the railroads, he highlights how the establishment of railroad corporations was facilitated by increased capital availability through loans, while the growth of the railroad corporations simultaneously furthered growth within financial institutional structures (Roy, 1997). Hugh Rockoff's paper entitled "Great Fortunes of the Gilded Age" specifically focuses on the returns that many capitalists experienced during this age of expansion. He remarks, "an investment in the stock market at the start of the Gilded Age would have increased, on average, by a factor of nine by the end of the era" (Rockoff, 2008, p. 18) Essentially, these structures became the proponents of their own expansion and of the financial markets.

The railroad industry not only pioneered the merger movement, but it was also the contributed greatly to the emergence the financial markets, especially with respect to its bonds and stock issues. "The stocks and bonds of railroads all over the country began to be listed and actively traded on the New York Stock Exchange as the capital of investors in this country and in Europe was mobilized in support of railways" (DuBoff, 1989, p. 62). The railroad industry's exponential growth caused financial institutions such as investment banks to

begin underwriting and mobilizing financial funds, as well as contributing their own capital. The financial market aided in stabilizing destructive competition, a major concern as discussed above, by overseeing corporate consolidations that enabled firms to have control over prices once again (ibid).

In this time, a direct connection between American industry and investment banks was forming. Banks were expanding outside their commercial limits, including investment banking and stock ownership. The greatest example of this blending between industry and finance can be seen in J. P. Morgan's financial empire. Morgan was the premier banker during the railroad consolidations, including control over establishing the trust of Vanderbilt's New York Central Railroad. Morgan, furthermore, serviced the federal government and in the 1890s, a number of prominent life insurance companies, the largest net buyers of corporate securities at the time. While facilitating the trusts within industries such as the railroads, Morgan was simultaneously building his own "money trust" during the evolution of financial markets (DuBoff, 1989).

V. The Great Robber Baron Fortune

As monopolies and oligopolies became more staple of the American capitalist economy at the end of the nineteenth centuries, the industrial leaders who controlled these companies were simultaneously becoming more prevalent in society. Their mass wealth and influence created a shift toward plutocracy (Cashman, 1984). John Reagan, a congressman from Texas at the time, furthers this by saying, "There were no beggars till Vanderbilts and Stewarts and Goulds and Scotts and Huntingtons and Fisks shaped the action of Congress and molded the purposed of government. Then the few became fabulously rich, the many wretchedly poor… and the poorer we are the poorer they would make us" (Cashman, 1984, p. 51). While these robber barons were reaping the rewards of the rise of big business, the general American was suffering due to many of the reforms explained during labor reform,

in turn producing rising inequality (Rockoff, 2008). Relying on a macroeconomic framework, Rockoff's concluding argument within his paper "Great Fortunes of the Gilded Age" rests on four factors of the economy that allowed entrepreneurs of the late nineteenth century to amass such wealth.

The first, relying on Chandler's argument on the necessity for firms for vertically integrated, explains how while the introduction of new technology allowed for short-run efficiency and lower costs for management, there was also a great deal of exploitation by the robber barons that led to their accumulation of wealth. He explains, "It often took… ruthless ambition and a willingness to break moral and legal constraints to succeed in exploiting the advantages created by new manufacturing technology" (Rockoff, 2008, p. 27). This quote mirrors one earlier discussed by DuBoff with respect to the Standard Oil Company's relentless expansion (DuBoff, 1989).

The argument continues to state that the economy of the Gilded Age was favorable to robber barons, specifically in terms of property rights and taxes. The property laws of the time were strongly protected, therefore allowing one to purchase and develop land across the country or even foreign investors from owning land in the United States. This increased capital flow from overseas simultaneously increased the amount of American millionaires. Perhaps the influential factor that allowed for the robber barons to amass so much fortune was the lack of federal income tax. The income tax that was enacted during the Civil War dissolved in 1872 and did not return until 1913. By this time, the ability to reinvest all returns earned during investments without the any loss due to taxes greatly impacted their savings and ultimately, led to the widening income distribution that Rockoff uses as his last point (Rockoff, 2008).

Not only did the lack of an income tax allow for rising income inequality but further, a shift from an agrarian economy to one of industry also impacts the

distribution of wealth. Rockoff argues that the urbanization that is a direct result of the industrial revolution produced increasingly skewed wealth. He is quoted as saying, "In our list of millionaires, we can see a particularly straight channel from urbanization to wealth inequality" (Rockoff, 2008, p. 28). Therefore, one can plainly see how the industrial robber barons of the late nineteenth century produced inequalities that our economy still battles today.

VI. The Standard Oil Company: A Case Study

Thus far, this paper has sought to examine transformation of industry from family-oriented firms to large-scale monopolies and oligopolies, in which robber barons controlled their own respective industry as well as the majority of wealth and governmental power. One specific example of this is The Standard Oil Company, a predominant oil refining company under the control of John D. Rockefeller. DuBoff describes the company as one that "… became the image of relentless expansion by any means it took to discipline an unruly industry and achieve satisfactory control over prices and output" (DuBoff, 1989, p. 48). The question of this case study becomes how did Rockefeller transform his company into one of the most successful trusts of its time?

John D. Rockefeller's began his entrepreneurial career in oil production the 1860s. According to Cashman, he achieved success through four stages. "Initial establishment of his own companies between 1862 and 1870; manipulation of transportation for his own advantage; ruthless elimination of competition; and an interlocking trust to unify his empire" (Cashman, 1984, p. 54). This empire first began in Cleveland, Ohio, but would expand to include refineries in Pennsylvania, New Jersey, and New York (Tedlow, 1991). Following fellow robber baron Andrew Carnegie's philosophy to "put all your good eggs in one basket and then watch that basket", Rockefeller made large-scale investments through the

growing financial markets that allowed him to gain economies of scale in which he constructed his monopoly (ibid.).

Establishing a new partnership with Henry M. Flager, increased capital pushed further expansion into the Standard Oil Company. The official formation of the Standard Oil Trust occurred in January of 1882. Unlike with a cartel or trade association, the trust allowed Rockefeller and his subordinates to control multiple subsidiaries across the country (Chandler, 1977). In 1866, a second refinery was constructed in Cleveland and by 1869, the company was producing 1,500 barrels of oil per day, triple what they produced just four years prior (Tedlow, 1991). The sheer size and skill of Rockefeller's refineries forced the unit cost to drop. "This relationship of scale to costs has remained central to the structure of the oil industry from that date to this. Thus, because Rockefeller's Cleveland refinery complex had become the largest in the industry, it also became its low-cost producer," Chandler explains (Tedlow, 1991, p. 34).

While unit costs may have plummeted, transportation costs were still increasing, reaching $2.00 per barrel of oil from Cleveland to New York in 1870. Rockefeller, however, was able to negotiate a 35% decrease in rates to $1.30 per barrel in exchange for supplying 60 carloads of kerosene per day (Tedlow, 1991). As discussed above with respect to the growth of financial markets, the use of accounting procedures allowed Rockefeller to closely monitor his production and distribution costs and in turn, lower them (Chandler, 1977). The railroads had grown just as dependent on the oil industry as the oil industry was on the railroads. With such low costs and high output, Rockefeller quickly conquered the Cleveland market and expanded into other refineries. Already controlling transportation, he sought to gain control over his competitors and supplies through the Standard Oil "alliance", trading Standard Oil stock for the assets of the competing firm. By

1880, there were 40 firms in the alliance and Standard Oil was controlling more than 90% of the market (Tedlow, 1991).

Rockefeller's foresight into the future had not only led the company to domestic domination, but furthermore, internationally. Rockefeller had international ambitions since the beginning of his company. By 1888, these ambitions were becoming reality as the company introduced a fleet of company-owned steam tankers in the Atlantic. Subsidiaries, whether wholly or partially owned, were established throughout Europe by the 1890s, allowing for domination of the oil industry well into the 1920s (Tedlow, 1991).

The success of The Standard Oil Company rested in John D. Rockefeller's ability to read his competition and inefficiency. Constantly improving his own firm, Rockefeller was closing smaller, inefficient refineries in favor of building larger, more productive ones into the turn of the century (Tedlow, 1991). His rationalization of production allowed him to gain economies of scale, lower unit costs, and eventually, reap the profits. Other attributes such as a steady supply of raw materials, and investment in technology and research and development, allowed Rockefeller, and so many of his capitalist peers, to transform an unknown company, in which he contributed $2,000 of capital, into a multi-million dollar global monopoly (Tedlow, 1991).

XII. Conclusion

The expansion that occurred in the latter half of the nineteenth century transgressed not only within the industrial sector, but also into the labor and financial markets. Large-scale manufacturing due to new technological advances led to a wave of consolidations and hierarchical management reform, leaving the most successful firms of the period in a monopolistic and oligopolistic economy with unprecedented amounts of capital. Case studies, such as J. P. Morgan and the Standard Oil Company, highlight the control of industry, government, and

wealth held by these industrial giants. While the innovation seen in The Gilded Age resulted in massive growth in output and capital, eventually causing the rise of big business and finance, it can also be remembered as a time of a divided workforce and rising inequality.

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Japan as a Clean Energy Leader
Stefan N. Norbom

Abstract
Over the past several decades, Japan's energy strategy had positioned it as the world's leader in clean and efficient electricity production and usage. This strategy, heavily dependent on nuclear energy, was essentially destroyed by one of history's largest earthquakes, followed by a tsunami which overwhelmed five nuclear reactors on March 11, 2011. As of April 2012, all of Japan's 54 nuclear reactors have been shut down and it is uncertain when and how many may be restarted. This paper examines Japan's options for crafting a new way forward with an energy policy to power the world's third largest economy while taking into account the lack of domestic sources of fuel, high government debt, anti-nuclear sentiments and looming power shortages.

Introduction

Japan's position as the clear leader in the area of clean energy has been threatened by the earthquake, tsunami and resulting nuclear disaster at the Fukushima Daiichi power plant. Japan needs to completely reevaluate its national energy strategy but this does not mean that Japan has to abandon its position a clean energy leader.

Over the past several decades, Japan has been a distinct leader in the area of clean and efficient energy. A Forbes special report published in 2008 listed countries leading in energy efficiency and the reasons why. Japan was #1 with energy (measured in BTUs per dollar of GDP) two-times more efficient than the US, more than 7 times efficient than China and 30 times more efficient than the Ukraine[1]

In general, much of this efficiency is driven by a country's stage of development and its access to fuel. Countries that are highly developed generally have higher technology and place more emphasis on productivity and quality of life than countries that are still pursuing quantum growth at any cost. Japan is highly

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1 Zumbrun, Joshua. "The Most Energy-Efficient Countries." *Information for the World's Business Leaders - Forbes.com.* 07 July 2008. Web. 09 Dec. 2011. <http://www.forbes.com/2008/07/03/energy-efficiency-japan-biz-energy_cx_jz_0707efficiency_countries_slide_2.html>.

developed but has almost no domestic sources of fossil fuel, so it uses these precious imported resources as efficiently as possible. This is not only because of the cost of importing fuel, but also in the interests of economic security, in that more dependency on importing fuel, the greater the risk of external factors and other countries controlling the direction of the economy.
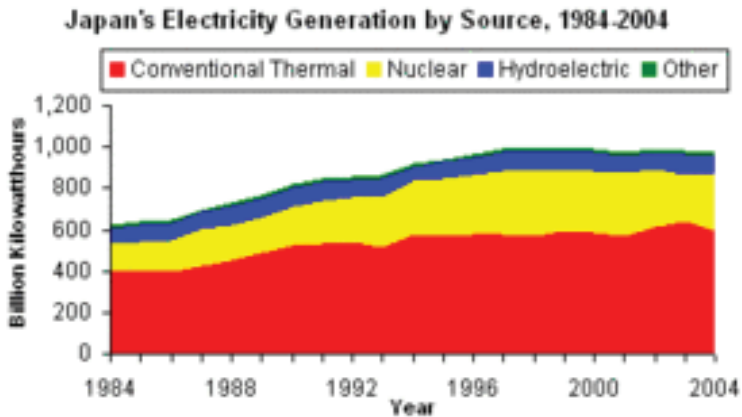
Another indication of Japan's leadership position in clean energy is their leading role in the development and adoption of the Kyoto Protocol, the United Nations Framework Convention on Climate Change (UNFCCC) on global warming, adopted December 1997 in Kyoto, Japan. The UNFCCC is an international environmental treaty targeting the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." As of September 2011, 191 states had signed and ratified the protocol, with the US being the only country to have signed but not yet ratified.[2]

With its focus on energy security, Japan's energy policy was highly dependent on nuclear as a source. Figure 1 shows how nuclear has become increasingly important to Japan's energy strategy. Starting in the 1960's, Japan installed nuclear reactors that supplied close to one-quarter of its electricity supply by 2004, and nearly 30% by early 2011 from 54 reactors in operation.[3]

2 Kyoto Protocol. (2010). In The Hutchinson Unabridged Encyclopedia with Atlas and Weather guide. Retrieved from http://www.credoreference.com/entry/heliconhe/kyoto_protocol
3 Cleveland, Cutler. "Energy Profile of Japan." *Encyclopedia of Earth*. 23 Apr. 2010. Web. 09 Dec. 2011. <http://www.eoearth.org/article/Energy_profile_of_Japan>.

Japan's Electricity Generation by Source, 1984-2004

Source: EIA *International Energy Annual 2004*

Figure 1: Japan's electricity sources 1984-2004

Furthermore, Japan's energy policy was set to grow its dependence on nuclear energy to more than 50% of its supply by 2030[4]. What could be better than clean energy with a virtually unlimited supply of fuel?

A drastic change of plan

At 2:46PM on Friday, March 11, 2011, the most powerful known earthquake to have ever hit Japan struck off its East coast. The earthquake had a magnitude of 9.0[5], and triggered a disastrous tsunami, with waves reaching heights of more than 40 meters (~130 feet) in the city of Miyako, in Tohoku's Iwate Prefecture. The earthquake knocked out the direct electricity supply to the cooling system of the Fukushima reactor, however backup power supplies were in place in the form of diesel generators and batteries. Then the tsunami struck the Fukushima plant with a wave more than twice the height of what the plant had been designed to handle. The two alternate sources of power were knocked out

4 Drysdale, Peter. "Japan's Energy Options after Fukushima." *East Asia Forum*. 5 Sept. 2011. Web. 09 Dec. 2011. <http://www.eastasiaforum.org/2011/09/05/japans-energy-options-after-fukushima/>.

5 Fackler, Martin. "Powerful Quake and Tsunami Devastate Northern Japan." *The New York TImes*. 11 Mar. 2011. Web. 9 Dec. 2011. <http://www.nytimes.com/2011/03/12/world/asia/12japan.html?pagewanted=all>.

and the cooling systems failed. No one could have anticipated or even imagined the triple disaster of March 2011 -- an earthquake, tsunami and a nuclear accident.

Without cooling, the most daunting of the problems facing Japan became containment after partial meltdowns in three reactors[6]. Radiation levels skyrocketed to 400 times the normal level. More than 200,000 people were evacuated from the surrounding areas. While still recovering from the severe loss of life and infrastructure, the events of March 11 forced Japan to begin evaluating options for a new energy strategy. Whereas Japan had considered atomic nuclear energy as the most promising path to a future with clean energy, a September 2011 poll by Japan's Mainichi Shimbun shockingly concluded that 74% of Japanese wanted to gradually phase out nuclear power completely. Following the crisis, former Prime Minister Kan announced future plans for a bottom-up review of the country's nuclear-focused Basic Energy Plan. Authored by the Ministry of Economy, Trade and Industry (METI) in collaboration with private power utilities, the plan announced the construction of fourteen additional nuclear power plants by 2030. Now Japan is forming a new national energy policy plan and is currently at a crossroads: should the country continue with their nuclear-centered plans based on economic security, or should Japan pursue another energy plan that may present a more acceptable path for its people?

Considerations of the new strategy

As the Japan government considers its strategy, there are several elements that need to be kept in mind and balanced:

Cost – What is the upfront investment and on-going costs give Japan's government debt already reached 220% of GDP?[7]

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6 CNN Wire Staff. "3 Nuclear Reactors Melted down after Quake, Japan Confirms - CNN." *Featured Articles from CNN*. 06 June 2011. Web. 09 Dec. 2011. <http://articles.cnn.com/2011-06-06/world/japan.nuclear.meltdown_1_nuclear-reactors-fuel-rods-tokyo-electric-power?_s=PM:WORLD>.
7 "List of Sovereign States by Public Debt." *Wikipedia, the Free Encyclopedia*. 6 Dec. 2011. Web. 09 Dec. 2011. <http://en.wikipedia.org/wiki/List_of_sovereign_states_by_public_debt>.

Speed of implementation – How soon can this be implemented in a significant way?

Long-term potential – How soon can alternatives be implemented and what is the ultimate potential that an electricity source can provide.

Energy security – Does this fit Japan's goal of being economically secure with its energy sources?

Cleanliness – Does it meet Japan's goal of clean energy?

Acceptance – Will the public accept the solution?

The strategic investment options can be viewed as follows with a high level assessment (R being bad, Y being challenging, G being good) of each alternative based on the above factors. Also noted is the supply situation as of 2009, which shows the heavy reliance on nuclear and fossil (oil, LNG and coal):[8]

Strategic Assessment (2009)

Generation	Supply	Cost	Speed	LT Pot	Secure	Clean	Accept
Nuclear	27%	G	G	G	G	G	R
Fossil	63%	G	Y	G	R	R	Y
Hydro	8%	G	R	R	G	G	G
Renewables	<2%	R	R	G	G	G	G
Distribution & usage Smart grid	-	R	Y	G	G	G	G
Control consumption	-	G	G	G	G	G	Y
Green use	-	R	Y	G	G	G	Y

Table 1: Strategic assessment of energy investment options

It is worthwhile to look at each of these areas to assess the relative benefits and negatives to being part of the new Japan energy strategy.

Re-introduction of nuclear energy

Today, only eleven of the fifty-four nuclear reactors in Japan are operating. Most of these were not affected by the March events, but have stopped operating due to the regulatory requirement for maintenance shut down every 13 months. To restart after maintenance, not only does the nuclear regulatory agency

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8 "Japan." *Country Analysis Briefs*. Mar. 2011. Web. 9 Dec. 2011. <http://www.eia.gov/emeu/cabs/Japan/pdf.pdf>.

need to give its approval but also the local government. It is the second half of that process that is proving difficult – local government is voted in by the people and the majority of people are against nuclear. If no reactors are restarted, all 54 will be shut down by April 2012 – 13 months after the events at Fukushima.

This could put a tremendous strain on Japan's economy, as it is difficult to cope with eliminating 30% of the power supply within such a short period. As we saw in the strategic assessment, there is no way to instantly replace this supply shortfall. The only solution would be a reduction in consumption and then, over time, fossil fuel sources can be built-up, and renewables in the long run.

The following is the view of 50 major companies, both Japanese and US, that comprise the US-Japan Business Council (USJBC), which met in New York on December 1-2, 2011: "Japan has a world-leading nuclear energy industry. As with renewables, nuclear energy offers virtually emissions-free power generation and requires no fossil fuel imports. It accounted for about 30 percent of Japan's power generation capacity prior to the events of March. The Council recommends that Japan promptly re-start nuclear power stations after assuring their safety. It would be unrealistic to expect that other sources of power generation could be built rapidly enough to offset a complete elimination of nuclear energy, and the costs would be high. Jobs and economic development should also be considered. For Japan's industry to succeed internationally, it is imperative for the country to maintain a strong domestic nuclear energy capability."[9]

The USJBC view represents a less-emotional, more practical perspective given the alternatives available. Yet the political situation will make this difficult to accomplish without a great deal of analysis and debate.

Conventional fossil fuels

Although Japan's goal is move towards green technology that utilizes

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9 Supplemental statement on Energy and Environment, USJBC Annual Meeting, New York City, December 1-2, 2011

renewable resources, conventional fossil fuels cannot be overlooked since it would take decades until renewable energy is a viable major source of energy. Currently Japan imports a high amount of liquefied natural gas (LNG), and with the recent discovery of unconventional gas reserves through shale, it seems more economically efficient and feasible to exploit this opportunity. One issue that Japan is currently facing as an importer of gas has to do with the scarcity of gas, which allows other countries with reserves to control and drive up the price. With the increase in supply of gas by 33%[10] (2015), which is due to the discovery of unconventional gas reserves, the overall prices of gas should begin declining (Refer to Figure 2). Recently the IEA has predicted that by 2035, unconventional gas will account for a staggering 35% of new global energy by 2035[11].As it becomes a more dominant source of energy, incentives will arise to innovate and create technology based solution that would mitigate the environmental impacts of gas thus making it even more clean.

Although coal has drawbacks of environmental pollution through the emission of green house gasses, coal currently is a reasonably priced fuel source[12]. Clean coal technology, while expensive, allows industries to capture the carbon that would be emitted prior or following the combustion process.

It is clear that fossil fuels need to be used to some degree, in the short-term in order to meet Japan's energy needs. Through innovation, firms will be able to minimize the environmental costs of fossil fuel use until renewable energy becomes a viable option in the long term. [13]

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10 Presentation by Department of Energy Representative at USJBC Annual Meeting, New York City, December 1-2, 2011

11 Supplemental statement on Energy and Environment, USJBC Annual Meeting, New York City, December 1-2, 2011

12 Supplemental statement on Energy and Environment, USJBC Annual Meeting, New York City, December 1-2, 2011

13 Presentation by Department of Energy Representative at USJBC Annual Meeting, New York City, December 1-2, 2011
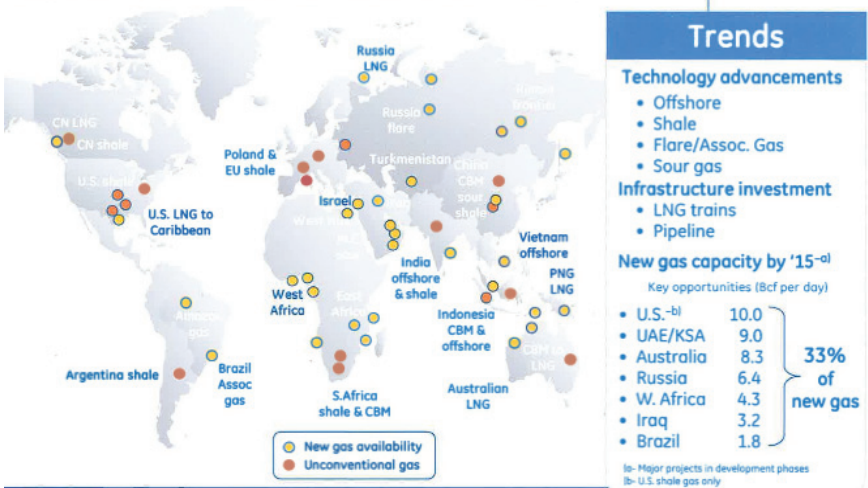
Figure 2: Recent trends of gas energy

Hydroelectric power

Hydroelectric power is clean and secure from an economic point of view, thus Japan has fully focused on exploiting this as a source of power and has grown capacity to 8% of total. Unfortunately, Japan has a limited geographic space and limited usable rivers and has already harnessed all major sources, so this does not represent a viable option for expansion in the future.

Other renewable energy

When considering renewable energy other than hydroelectric, the main alternatives are wind, solar and geothermal power. Prior to his resignation, Prime Minister Kan announced a bold objective to increase the supply of renewable energy from its current contribution of less than 10% to 20% by the 2020s. The planning agency of Japan's economy, METI (Ministry of Economy, Trade and Industry) outlined aggressive objectives for both solar and wind power as can be seen in the chart below:
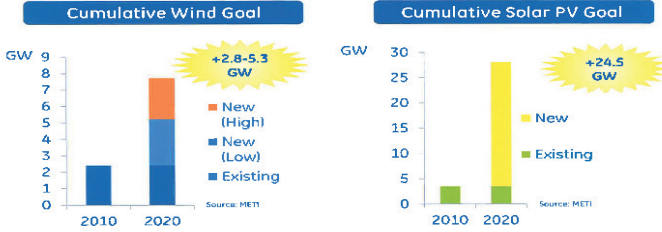
Figure 3: Objectives for solar and wind power

Geothermal was essentially considered as having little potential due to cost and, again, geographic limitations.

For any country, having a large supply of electricity from renewable resources provides numerous benefits. Specifically, renewable energy can be incorporated into Japan's electricity production strategies while not adding any greenhouse gas emissions to the environment. But incorporating renewable energy such as solar and wind power is no easy task. The following are obstacles that would need to be addressed: (1) The energy that would be produced from solar and wind are determined by the availability of sunlight and wind, therefore there is necessary research and development required in order to increase the efficiency and stability of these technologies; (2) Policies need to be developed to accelerate the onerous approval and review process currently in place in Japan; (3) at its current scale and technology, renewable energy is far more expensive than conventional fossil fuels, and (4) It takes a great deal of time and effort to build sufficient scale to be a significant contributor to the overall capacity. Because of these issues, Japan currently generates less than 1% of its power from solar and wind power but has committed, nonetheless, to move aggressively in

this direction. One recent positive sign -- the Action Plan to Stabilize Energy Demand-Supply was announced on November 1st, 2011, and this plan will address the regulations making renewable energy a more viable energy option.

In terms of the costs of wind and solar energy, technology has advanced at an incredible rate and the cost gap is closing on conventional fossil fuels. Some believe that, if the cost of CO2 and other emissions are considered, the cost equation is even closer. As an example, technology has advanced in the wind turbine area so that a single wind turbine can support the energy needs of 700 homes today versus only 420 homes in 2005.[14] Similar advances have been made in the solar energy area.

Technology advancements in storage and transmission and management can also address the stability of these power sources, but again this will take time. While solar and wind can be a major contributor to Japan's power supply, there will need to be other solutions to fill the short and medium term needs of the country.

Distribution and usage control

One major opportunity for Japan lies in the integration and distribution of technology that can control the usage of energy resources, which is further enforced by the estimate that only 70% of energy produced actually is productively used.[15] Through three major improvements, enormous benefits can be captured: Japan currently has one grid operating on a 60 Hz and one on a 50 Hz[16], one supplying the east and one supplying the west. This network connection issue is problematic because of the reduction in flexibility if one system experiences a power outage. Following the March 11th tsunami and earthquake, the two incompatible systems prevented eastern Japan from "borrowing" electricity from western Japan. A second issue is the grid reliability: through developing smarter

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software systems the grid reliability and efficient usage of energy can be greatly improved. As recommended by the USJBC members, the United States and Japan should work together and develop a framework that will increase the efficiency of the distribution grids, through the integration of information and communication technologies into the already existing infrastructure[17]. The final improvement involves research and development in order to improve energy storage capability. Doing so would have three major benefits: (1) Secure supply to critical operations and facilities (examples: hospitals, communications, and nuclear power plants). (2) Facilitate energy stability management and peak demand. (3) And the successful integration of renewable energy into grid[18]. Therefore there is also a need for innovation in developing superior large size batteries to bring stability to the grid systems, particularly to renewables sources that have inherent variability.

The Japanese Government successfully established power-saving targets to avoid rolling blackouts in various areas of Japan during the peak summer season. Major users of electricity cut their consumption by up to 25%, while smaller industries reduced electricity consumption by 20%, and household 15-20%[19]. The potential energy efficiency increase could be enormous by incorporating a demand side program, which would increase the consumption and distributions of energy sources.

Supply or demand-based solutions – the Nautilus proposal

The Nautilus Institute for Security and Sustainability, located in San Francisco, Seoul, and Melbourne have analyzed and suggested that there are essentially two approaches to the problem – either central supply control or demand and usage control.

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17 Supplemental statement on Energy and Environment, USJBC Annual Meeting, New York City, December 1-2, 2011
18 Supplemental statement on Energy and Environment, USJBC Annual Meeting, New York City, December 1-2, 2011
19 "BBC News - Japan Sets Power-saving Targets to Avoid Blackouts." *BBC*. 8 Apr. 2011. Web. 09 Dec. 2011. <http://www.bbc.co.uk/news/business-13008846>.

The Tokyo Electric Power Company (TEPCO) provides electricity to nearly 45 million people or 35% of Japan's population, while 12 million others are served by Tohoku Electric Power Company. Both TEPCO and Tohoku have announced power rationing programs, including rolling blackouts in many areas not affected by the earthquake and excluding central Tokyo[20]. Clearly TEPCO and Tohoku will struggle to fulfill Japan's electricity needs in the short term. The alternative "Best Case" scenario strategy, as outlined by Nautilus, focuses on the inevitable supply shortfall the two electric companies will experience, and which is likely to last five years. During this time, the condition of the existing nuclear and thermal reactors would be evaluated. The plan would also promote firms and individuals to employ "demand-side" alternatives, or energy-efficient and energy-saving techniques and regulate electrical distribution at the customer site, rather than using central power stations[21]. This demand-side approach would aim to generate excess energy, which could then be distributed through a smart grid that can accept power inputs, and re-distribute at a local level. For example, an office building could be equipped with a photovoltaic array on the rooftop that helps power the building[22]. The grid approach would allow intermittent renewable energy use to be scaled up, together with an aggressive program promoting extremely efficient end-use technologies, as well as energy conservation and peak power management[23]. This approach is believed to be cheaper, quicker, environmentally cleaner, and less risky in the short and long run, than relying on susceptible costal thermal or nuclear power plants to fulfill the demand for power.

20 "See, for example Tohoku Joins Tepco in Rationing Power", *Japan Times*, March 16, 2010, [retrieved 17 March 2011] <http://search.japantimes.co.jp/cgi-bin/nn20110316a5.htm>.
21 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.
22 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.
23 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

The Nautilus report compares two approaches to the issues faced by Japan: The first deals with energy efficiency, renewable energy and distributed generation (EE/RE/DG) estimated to cost US$11 billion per year.[24] The second includes central station gas and nuclear plants, estimated at US$10 billion/year.[25] Cost not withstanding, the long and short term benefits of each option provide very different results.

While the EE/RE/DG scenario is more costly in the short-run, over time as the program is deployed, it should prove to be a more cost-effective solution when taking into account the benefits of an early recovery that would otherwise result in unmet electricity demands. In addition, the demand-side management program, which would begin in the TEPCO/Tohoku service territories, ramps up so quickly that by the second year of the program, it saves 2% of sales annually. The program commands quick deployment over the next four years of energy-efficient and renewable sources, and consumer-site, gas-fired generation. Based on initial estimates, the program would be able to provide 81 TWh of delivered electricity supplies annually after the four-year implementation stage, in addition to 22 GW of delivered summer peak power[26]. This option would also bring emissions of 50% less carbon dioxide, which would aid in Japan's ambitious green house gas emission reduction goal, supporting the development of a "green economy." Another benefit is the ease of implementation. Although costly, it would begin producing and saving power immediately, in comparison to the central station option which would take three years or longer to implement, which would mean high costs from unmet electricity demand. While the EE/RE/DG program would

24 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

25 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

26 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

cost 14 cents/kWhe, the central station alternative would amount to 12 cent/kWhe, but considering the uncertainty of the central station alternative, the cost would be much higher than 14 cent/kWhe[27]. The destruction caused by the March disasters means Japan will rebuild a significant amount of infrastructure, at an estimated cost of US$310 billion. New infrastructure provides an opportunity to supply electricity grids, factories etc. with the most energy-efficient technology, incorporating "smart grid" technology[28]. The benefit of pursuing EE/RE/DG is difficult to calculate, but the marginal cost needed to bring improvements could create incentives for investment into larger market energy efficiency, demand-side technologies (such as solar hot water and solar photovoltaic systems) and distributed generation in Japan[29]. And the estimated total savings from this approach would be significant and possibly displace 50 million tons of carbon dioxide from thermal power plants.[30]

A holistic approach with emphasis on demand side control

At the USJBC Annual Meeting on December 1st and 2nd, it was extensively discussed to take a holistic approach by creating an intelligent and diverse energy system.[31] In doing so it will decrease the risks and costs associated with energy supply and production while at the same time making Japan's energy processes more cost-effective and efficient. The common opportunity presented in this approach, but more heavily stressed in the Nautilus approach, is the focus

27 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

28 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

29 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

30 Von Hippel, David, and Kae Takase. "The Path from Fukushima: Short and Medium-term Impact of the Reactor Damage Caused by the Japan Earthquake and Tsunami of Japan's Electricity Systems." Nautilus Institute for Security and Sustainability, 11 Apr. 2011. Web. 9 Dec. 2011.

31 Supplemental statement on Energy and Environment, USJBC Annual Meeting, New York City, December 1-2, 2011

on demand side programs, which entail capturing a greater proportion that 30% of the electricity wasted through improving the efficiency of existing systems while also cutting demand with improved technology, monitoring and controls. The practicality, emissions and low costs in comparison to alternative approaches, associated with demand side, indicates that greater emphasis should be placed on increasing energy efficiency through developing smarter systems.

The priorities under this approach with an emphasis on demand-side efficiencies would be as follows:

- Close the short-term supply-demand gap through 1) policies and incentives to encourage overall and peak demand reduction; 2) restart the newer nuclear reactors located in areas considered safe from earthquakes and tsunami risk.

- Formulate policies to increase the research and development and manufacture of smart grid, energy storage and clean distributed energy solutions to reduce the need for energy supply.

- Encourage installation of the most efficient gas-generated thermal energy systems as these are the cleanest and lowest overall cost (inclusive of consideration of emissions) alternatives to nuclear power that can be installed within the short term and take advantage of the new supply of unconventional gas.

- Put in place policies and incentives to encourage the rapid installation of renewable energy systems as these will be clean, cost competitive solutions in the long term, but need to be started now to be a significant part of the solution.

With these priorities in place, Japan can quickly address its energy needs and move confidently into the future with a clear path to maintaining its secure energy position and role as clean energy leader.

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An Attempt to Reshape Capitalism's Image
Ross Nichols

Introduction

John Stuart Mill claimed to be a disciple of both Jeremy Bentham and David Ricardo. This was a strange proclamation because each man advocated a competing theory of value; Bentham's utilitarianism laid the foundation for the utility theory of value and Ricardo developed the labor theory of value. Mill's goal in attempting to unify these theories of value was to provide a solution for the growing class conflict that plagued capitalism. Class conflict arose as feudalism was phased out and industrial capitalism replaced merchant capitalism as the dominant economic system. The Corn Laws symbolized this competition between classes. Capitalists were against the Corn Laws because the subsequent tariffs would lower their rate of profit. Landowners supported the Corn Laws because they increased the rent on land. Even Karl Marx held spoke out against the Corn Laws on behalf of the working class. Capitalism fostered persistent antagonism between classes as each struggled to gain or maintain power; no class was immune from this contest. Class conflict was therefore ubiquitous in capitalist society and generated widespread scrutiny and debate over capitalism. Jeremy Bentham and David Ricardo took opposing sides in this debate. Bentham was initially supported it but died a reformist. Class conflict was resolvable but not under the current form of capitalism. Ricardo's labor theory of value promoted the view that class division occurred naturally in a capitalist society. And since capitalism was the best possible economic system, class division was a necessary evil and could not be remedied. Both Ricardo and Bentham acknowledged that class conflict was inherent in capitalism but each treated it differently. In claiming to be a disciple of both men, Mill hoped to show that capitalism could exist alongside social harmony. His goal was to change the nature of capitalism.

To achieve this, Mill had to accept both utilitarianism and the labor theory of value, and reconcile their differences. He was ultimately unsuccessful. Mill made so many qualifications to both Bentham's utilitarianism and Ricardo's labor theory of value that he argued against them. While Mill did formulate a philosophy of utilitarianism, it challenged Benthamite utilitarianism on a fundamental level. Bentham focused on individual utility but Mill was more concerned with social utility. Mill's split from Ricardo was even more drastic. He accepted the labor theory of value, but on the strict condition that the ratios of capital to labor were equated across industries. Mill realized the unlikelihood of this ever occurring and promoted a Smithian adding-up theory of value as a generally more applicable measure of value. Thus while he claimed to be a disciple of both Bentham and Ricardo, Mill modified their theories to such an extent that his own utilitarianism and theory of value were contradictory. However, Mill's attempt at reconciliation should not be viewed in vain. His was the most concerted effort to unite utilitarianism and the labor theory of value. He made the best attempt at reshaping the image of capitalism.

This paper will begin by discussing the origin of the contrasting theories of value in classical political economy. The first section will describe Adam Smith's unsuccessful search for an invariable measure of value. An analysis of Benthamite utilitarianism and Ricardian labor theory of value will follow. Each theory treats the class conflicts that erupted during this time period differently. It is critical to examine these perspectives because they were the basis for Mill's attempt at reconciliation. After Bentham's utilitarianism and Ricardo's labor theory have been discussed, Mill's own utilitarianism and theory of value will be evaluated. There were parallels in Mill's thought that linked him to his idols, which will be discussed briefly. The differences in thought represented his attempt at synthesizing the competing notions of value. These will be studied

closely. During this analysis it becomes clear that Mill betrayed his allegiances to both Bentham and Mill and as a result, ultimately failed in his attempt to recast capitalism. This will be addressed in the conclusion. The conclusion will also compare Mill's hopeful outlook on capitalism with Marx's critical perspective of it.

An Elusive Measure of Value

The utility and labor theories of value resulted from the inability of Adam Smith to find an invariable measure of value. Despite his attempts to develop a theory of prices, Smith was unable to derive a theory in which prices of goods were explained by something other than prices. This led economic thinkers to seek out determinants of value that were independent of prices. Two theories arose. One argued that the amount of labor embodied in a good determined value and the other contended that value lay in the utility a good provided. Jeremy Bentham was the leading advocate of the subjectivist utility theory of value while the objectivist labor theory of value originated with David Ricardo. Yet although the foundations of each theory are distinctly different, noticeable overlaps formed between the two. Policy was the most prevalent example of this. Many objectivists promoted policies similar those prescribed by Bentham and numerous subjectivists endorsed policies comparable those supported by Ricardo. John Stuart Mill is the most intriguing example of this overlap. His social policies paralleled Benthamite thinking but his economic policies were analogous to Ricardo. Thus Mill exhibited both Benthamite and Ricardian influences. While two invariable measures of value were found, it did not seem as if the related theories of value were mutually exclusive.

Adam Smith constructed his theory of prices on the argument that human labor determined the value of a good. However, unlike the labor theory of value, Smith believed labor determined exchange value only in the "early and

rude state of society" (Smith, 1869 [1783], 49). After a society progressed to a capitalist economy, price was determined by wages, rent and profit; an adding up theory of value. Smith contended a labor theory of value no longer held when profits were introduced because they had no relation to the labor embodied in a commodity (Hunt, 2002, 52). Smith thus believed that while labor embodied in a product still remained proportional to the price of good, it could no longer be its sole determinant. He also posited the notion that value of capital per worker varied by industry (Hunt, 2002, 52). As a result, profits and wages created a price disproportionate to the amount labor embodied in the production of a good. But Smith never articulated a method to determine how labor embodied in a good influenced its price in this scenario.

Two critical problems arose from Smith's theory of prices. First, in stating that prices were determined by wage, rent and profit, Smith derived prices from prices. This meant his theory of prices rested on circular reasoning. Second, Smith was able to make inferences about the general price level but he failed to mention anything about the relative value of goods. An implicit consequence of Smith explanation of prices in terms of other prices was that if any of the cost components rose, the value of that good had to rise as well. Yet Smith also believed that the value of capital per worker varied by industry. The effect of a price increase in a common input would have an effect on the price of a good proportional to its dependency on that input in production. Commodity prices would thus increase by the different amounts (Hunt, 2002, 55). These faults in Smith's theory of prices ignited a search for invariable measures of value. Bentham argued that the utility of a good determined its worth, Ricardo believed the amount of labor embodied in a commodity determined its value.

Two Solutions to Smith's Dilemma

Bentham's utilitarianism is best exemplified in his claim that "nature has placed mankind under the governance of two sovereign masters, pain and pleasure" (Bentham, 1823 [1789], 1). He reasoned that all human behavior could be reduced to either seeking out pleasure or avoiding pain. And since he considered humans to be rational, they naturally sought to maximize pleasure and minimize pain. Measuring the amount of pleasure or pain an experience generated could be reduced to a simple calculation. For an individual, pleasure and pain were measured by an event's intensity, duration, certainty, propinquity, fecundity and purity; when an action involved multiple people its effect on others was also taken into account (Bentham, 1823 [1789], 30). Propinquity is the nearness in time this sensation will be felt. Fecundity was the likelihood of a pleasurable act continuing to generate pleasure. Purity was the chance this same act would not cause pain later. Actions with a high utility were considered beneficial and moral and actions with a low utility were detrimental and immoral. The interests of the community then simply became the aggregate of these individual utilities. However, Bentham considered the community a fictitious entity (Manning, 1968, 17). It was possible to measure a community's happiness, but it could not be studied apart from the aggregation of individual utility. Utilitarianism was thus focused solely on the individual. Bentham acknowledged the implicit difficulty of individual utility measurements but he feared that without it, people would behave irrationally (Manning, 1968, 35). This confidence in utilitarianism was the basis for his theory of value.

Bentham's utility theory of value was rooted in felicific calculus, which he believed was applicable to all aspects of life and included the purchase of commodities. The more pleasure someone derived from a good, the more they would be willing to pay for it. Bentham argued that the value of good was

dependent on the likelihood someone had it, the amount of time the owner would have it, and the length of time it took the owner to attain the good (Bentham, 1823 [1789], 32). This adherence to felicific calculus allowed Bentham to articulate a method for determining the price of a good without using other prices. He also came close to defining marginal utility. Once wealth had been accumulated beyond the subsistence level, the happiness gleaned from every additional unit of decreased. Eventually people would become indifferent at the prospect of an additional unit of wealth. The utility theory of value became a relevant solution to Adam Smith's problem. However, Jeremy Bentham was not the only person to develop a non-circular theory of value.

David Ricardo began his *Principles of Political Economy and Taxation* by conceding that utility was present in all goods but that it also had no influence over exchange value. To highlight his point, Ricardo compared gold and water (Ricardo, 1876 [1821], 9). Gold is much more valuable than water but the latter has many more uses he argued. Price therefore had to be determined by something else. Ricardo believed that scarcity and the labor embodied in the production of a good determined its value (Ricardo, 1876 [1821], 9). And since Ricardo focused on everyday commodities, exchange value was determined almost entirely by the labor embodied in a good, which was present in several different forms. Present labor was the labor required to produce the final good. Past labor created the intermediate goods and tools used in the production of the final good. If a good required specialized or more educated labor, this was also factored in. Thus Ricardo also developed a theory of value that also avoided Adam Smith's circular reasoning. Yet while the labor theory of value stood in contrast to the utility theory of value, the two men had a strong friendship and Ricardo adhered to a philosophy akin to utilitarianism.

Cremaschi 2004 argued that Ricardo drew much of his philosophy from Thomas Belsham, a minister. Belsham believed that utility was important on a universal scale in order to promote the greatest amount of happiness to the greatest amount of people (Belsham, 1801, 432 cited in Cremaschi, 2004, 391). Ricardo agreed with this view on utility so he necessarily agreed with Bentham in that the principle of utility was needed to determine moral standards. Where Ricardo differed from Bentham was the extent to which this felicific calculus could be applied. He felt it was impossible to compare individual measurements of happiness (Cremaschi, 2004, 390). This is why Ricardo maintained that labor was better determinant of value than utility. Felicific calculus could not work if every source of happiness was incomparable to every other source of happiness; this applied to commodities as well. Although Ricardo purported a different value theory than Bentham, they agreed that the principle of utility was could be used to determine the "greater good". The relationship between Ricardo and Bentham is thus itself the beginning of the overlap in classical political economy; Ricardo accepted the presence of utility in commodities but he did not agree with Bentham's method for determining value. It was possible to consider one theory of value superior while simultaneously advocating policies associated with the founder of the opposing theory of value.

Rational subjectivists such as Jean-Baptiste Say, Nassau Senior and Frédéric Bastiat promoted the utility theory of value but their view on policy was much more similar to Ricardo than Bentham. They advocated freedom from government intervention and argued for free trade and existing property laws. Although Bentham originally supported laissez faire capitalism, he became a reformist and promoted the reallocation of wealth and income, in addition to amending property laws. This reformist attitude was shared by Ricardian Socialists like Thomas Hodgskin and William Thompson. These men favored

redistributing wealth from the capitalists to the laborers and giving workers more control over the means of production. While the two theories of value remained distinct, they did not govern one's views on policy.

The fact that proponents of the labor theory of value argued for reform of capitalism and that utilitarians contended social harmony already existed hinted at a split within classical political economic thought that was deeper than the utility and labor theories of value. Treatment of class conflict was the root cause of the schism in classical political economy. The class that economic thinkers identified with dictated how they viewed the struggle between social classes. Jeremy Bentham identified with the working class because he believed that social conflict was a pressing issue in capitalist societies that could be fixed. Bentham was not a member of the working class but he supported them because he argued that class conflict could be resolved. This was based on his belief that private property was a man-made institution (Hunt, 2002, 188). Ricardo identified with the capitalists because he believed that class conflict was inherent in human nature; it was useless to attempt to remedy it. Unlike Bentham, Ricardo argued that the institution of private property was natural and eternal (Hunt, 2002, 122). Thus the main division in classical political economy was how economists responded to the presence of class conflict. Those who believed that private property was an ephemeral entity believed class conflict could be solved by adopting a more socialistic economic system. Ideology was a key determinant on how one responded to class conflicts in capitalism. The split in classical political economy was thus rooted in the differences in the treatment of class conflict. John Stuart Mill tried to do more than simply unite two incompatible theories of value, he wanted to completely alter the nature of capitalism. Mill wanted to show that social harmony could exist within a capitalist society.

Mill the Disciple

That Mill claimed to be a disciple of both Jeremy Bentham and David Ricardo should come as no surprise. Mill's father was close friends with both Bentham and Ricardo, and was an overbearing presence in his son's life. Bentham clearly influenced the elder Mill beyond their personal relationship, as evidenced by the Benthamite principles found in the elder Mill's writing (Anderson, 2006, 12). James Mill also considered himself the "spiritual father" of Ricardo (Bowring, 1838-43, 10: 498 cited in Cremaschi, 2004, 378). It was James Mill who first formed the potential link between utilitarianism and the labor theory of value that his son would attempt to solidify. John Stuart Mill became indoctrinated in his father's ideas as the elder Mill groomed his son to carry on his work. John Stuart embarked on a rigorous education plan at the behest of his father and by the time he was a teenager, the younger Mill had become proficient in Latin, Greek, and differential calculus. Initially, it appeared James Mill had successfully molded his son to be his successor, to unite utilitarianism and the labor theory of value.

At first glance, Mill upheld his claim to be a disciple of Bentham. Mill believed that pleasure and the avoidance of pain were the best possible outcomes of an event (Mill, 2006 [1861], 68). Like his predecessor, this led Mill to equate utility with the greatest happiness principle and underscore the equality of all individual measurements of utility; societal utility depended on the equal consideration of the utilities of the entire population (Mill, 2006 [1861], 111). Mill thus paralleled Bentham on two fundamental points. The basic definition of utility for both men rested on the presence of pleasure and the absence of pain. Also of critical significance was the importance placed on measuring individual utility. Mill began his own analysis of utilitarianism from a Benthamite perspective.

Mill drew on his allegiance to Ricardo as he constructed his theory of value. In his *Principles of Political Economy*, he argued something nearly identical

to the labor theory of value; that the value of commodities was determined mainly by quantity of labor required to produce it (Mill, 1884 [1848], 264). Mill also promoted Say's Law, which stated that a general glut of commodities was impossible. He believed that whoever brought additional commodities to the market also brought an additional increase in purchasing power, which was analogous to an increase in demand (Mill, 1884 [1848], 366). And most importantly, Mill acknowledged the critical exception inherent in the labor theory of value: it only held when the ratios of capital to labor were equated across industries. Both men realized that any labor-based theory of value had to account for this issue. The influence of David Ricardo was evident in the formation of Mill's own theory of value.

Yet it soon became clear that John Stuart Mill did not completely agree with Bentham's utilitarianism and Ricardo's labor theory of value. Free from his father's watchful eye after James's death in 1832, John Stuart began to openly criticize Bentham. He also found fault with the labor theory of value. Mill's *Utilitarianism*, published in 1861, and his *Principles of Political Economy*, first published in 1848, were written in order to address what Mill deemed shortcomings in the theories of Bentham and Ricardo. These attempts ultimately proved unsuccessful. Despite his claim to be a disciple of Bentham and Ricardo, Mill refuted both Benthamite utilitarianism *and* the labor theory of value.

Mill's Great Endeavor

After James Mill's death, John Stuart broke free from his father's doctrine. He published an essay in the *London and Westminster Review* in 1838 which criticized Bentham's narrow view of human nature and underscored the difficulty of applying the utility principle. Mill argued that happiness was too complex to be sought directly, effectively discounting the utility principle except as an "organizational discipline" (Hollander, 1985, 634). Benthamite utilitarianism limited the emotions humans could experience, Mill claimed. Bentham was also

faulted for depicting pleasure and pain as aloof masters of human action, giving utilitarianism a cold nature. Mill's separation from Ricardian thought was even more pronounced. While Mill never renounced utilitarianism, his qualifications of the labor theory of value led him to advocate an entirely different theory of value. Mill considered it his duty as a disciple of both Bentham and Ricardo to resolve the faults in their theories, but his conclusions bore little resemblance to Benthamite and Ricardian thought.

Mill believed Bentham's principle of utility was too simplistic. It was not enough to determine happiness solely on the quantity of pleasures received; the quality of pleasure also had to be taken into account. There existed pleasures of such great quality that men would be unwilling to trade them for any quantity of lesser pleasures, even if more pain was associated with the greater pleasure (Mill, 2006 [1861], 68). Yet people could not automatically determine the quality of a pleasure, they had to cultivate and develop feelings in order to distinguish qualities of pleasure. This stood in stark contradiction to Bentham's belief that happiness was determined solely by the quantity of pleasures. Mill furthermore contradicted Bentham when he wrote that a person could act rationally without being happy (Mill, 2006 [1861], 74). Mill believed that virtue, sacrificing one's own happiness to increase the happiness of others trumped individual happiness. Utilitarianism was not entirely individualistic and in fact had a critical social component. The final major difference in utilitarianism Mill espoused regarded felicific calculus. If people calculated the consequences of every action they took, they would never have enough time to actually carry them out (Mill, 2006 [1861], 81). Rather than spending this time calculating to maximize their own happiness, people had to promote the utility of society as a whole. Thus while Mill was a proponent of utilitarianism, his utilitarianism was fundamentally different from Bentham's in that it was much more complex and founded on the idea of social utility.

Principles revealed a much more drastic change in Mill than the one seen in *Utilitarianism*. The divergence between Mill and Ricardo can be traced to how each treated the caveat in the labor theory of value that it only held when the ratio of capital to labor was equated across industries. Since Ricardo's labor theory of value consisted primarily of easily reproducible commodities, he largely disregarded this stipulation. Although Mill accepted the labor theory of value, he was strongly influenced by the improbability of the capital-to-labor ratio qualification. He believed that the cost of production did determine the exchange values for goods but this was not synonymous with Ricardo's theory of value. The cost of production included both the wages paid to the laborer *and* the remuneration for the capitalists' abstinence (Mill, 1884 [1848], 265). Value was thus derived from other prices. There was no such thing as an invariable measure of value under realistic conditions. This supposed improvement of Ricardo's labor theory of value was actually a regression back to an adding-up theory of prices. Mill's theory of value was more Smithian than Ricardian. There were also numerous inconsistencies between Ricardo's and Mill's view on profits. While Ricardo contended that there was a tendency for profits to fall as capital was accumulated, Mill identified several counteracting tendencies which stabilized the rate of profit. Factories became fixed capital and subsequently became sunk costs (Mill, 1884 [1848], 504). If factories were sunk costs, they had no effect on wages or profits. More efficient production enabled capital to be accumulated without lowering the rate of profit (Mill, 1884 [1848], 505). Cheap commodities from foreign countries would also boost the rate of profits (Mill, 1884 [1848], 506). Capitalists could pay their workers lower wages if food prices declined and inexpensive raw materials would cut production costs. Mill's interpretation of value clashed with Ricardo's despite his supposed discipleship.

Conclusion: Mill vs. Marx

John Stuart Mill considered himself a disciple of Ricardo because he believed in the capitalist system. The socialist programs put forth by the likes of Owen, Saint-Simon and Fourier were either impractical or undesirable (Schwartz, 1972, 191). Mill identified himself as a Benthamite disciple because, like Bentham, he also sought to end class conflict. Thus by combining utilitarianism with the labor theory of value, Mill wanted to show that capitalism and social harmony were not mutually exclusive. He approached the class conflict generated by capitalism from a new perspective. It was more radical than merely writing the subject off as a necessary part of capitalism but it was not so extreme that it called for an entirely different economic system. Mill believed capitalism was flawed, but he also thought he could fix it. It was impossible for him to be a disciple of Bentham and Ricardo simultaneously because they were biased from which classes they identified with. Mill wanted to reconcile the worker and capitalist perspectives of capitalism to create a new form of capitalism. As a result, his recommendations on policy reflected both Benthamite and Ricardian influences. Bentham's influence was most clearly seen in aspects of social policy. Like Bentham, Mill believed that equality under the law was necessary for social harmony (Mill, 2006 [1861], 99). If lower classes were made responsible for their own lives and decisions, they would be more likely to improve their social standing. But this increased responsibility meant that education needed to be reformed so the poor could be more informed decision makers, another similarity to Bentham. In regards to economic policy, Mill had more in common with Ricardo. He advocated international trade on the basis of comparative advantage (Mill, 1884 [1848], 380). Mill also wrote that the government should make no distinction between classes (Mill, 1884 [1848], 539); the poor should not get special treatment simply for being poor. Thus while Mill was against providing

the poor with excessive economic relief, he promoted the idea of treating them as social equals. Economic equality would grow from this social equality.

This stood in stark contrast to the view of capitalism espoused by Mill's peer, Karl Marx. Marx believed the workers would rise up against the capitalists and introduce an era of socialism. "As long as there are capitalists and workers, the workers will be exploited," (Marx, 1963 [1848], 221) he proclaimed. Social harmony could only be achieved when class divisions were abolished. He advocated the abolishment of the Corn Laws because he believed it would accelerate the process of a proletarian revolution. Marx thus took a critical, pessimistic view of capitalism whereas Mill believed it could work. The schism in classical political economy was not so much the divide between the utility and labor theories of value as it was the opposing views on the future of capitalism, in particular what needed to be done about class conflict. Mill tried to reconcile these views but was ultimately unsuccessful. His proposed reform of capitalism did not have a lasting impact. Severe class divisions still dominate capitalist societies today. In the end, Mill was overshadowed in the annals of economic thought because he was overly ambitious and took on an impossible task. John Stuart Mill wanted to mend the image of capitalism.

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