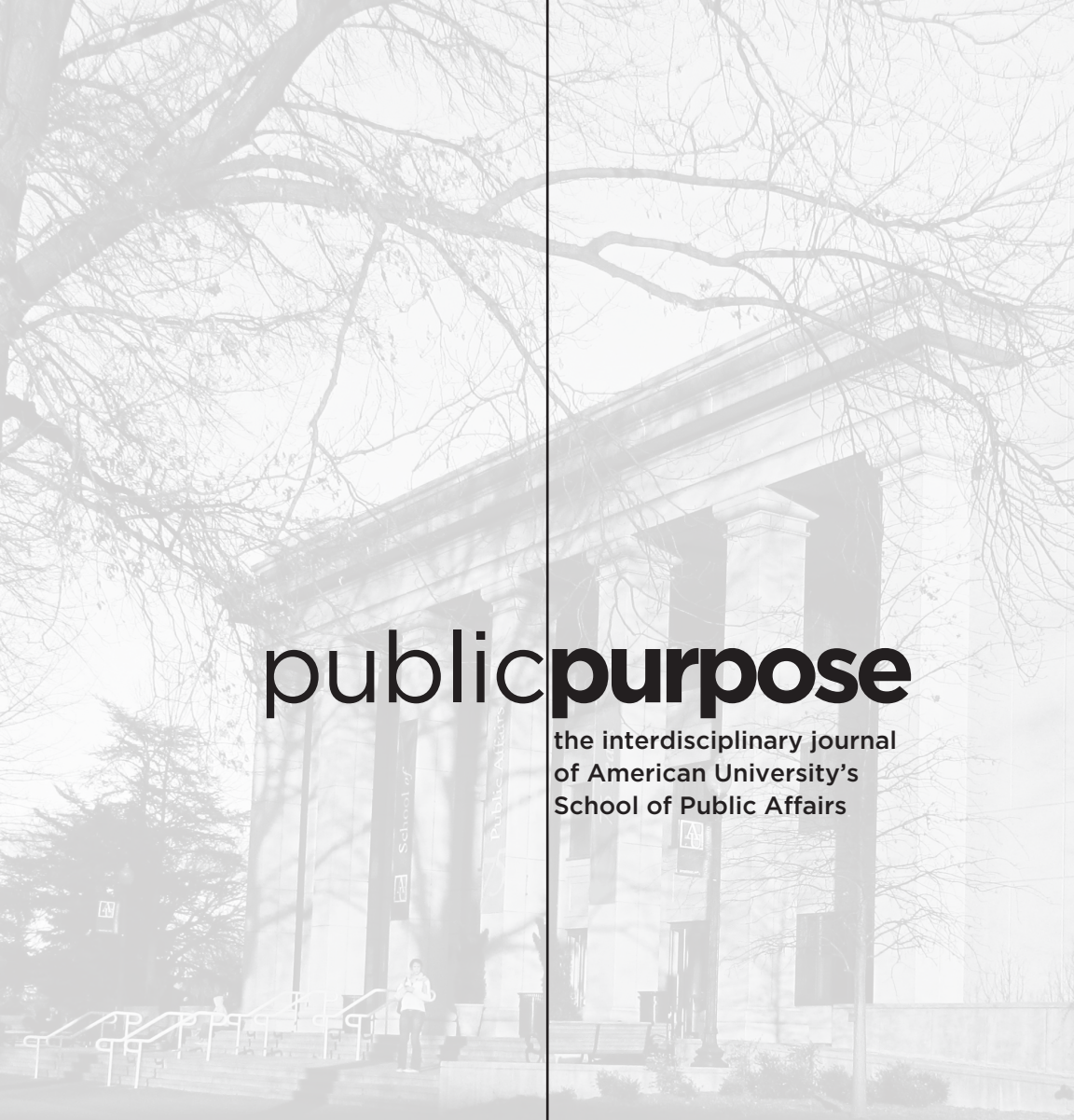

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About *The Public Purpose*

The Public Purpose is a peer-reviewed interdisciplinary journal published by the School of Public Affairs (SPA) at American University. As a signature project of the SPA Graduate Council with support from the SPA faculty, the journal exclusively presents the work of graduate students from the SPA Departments of Government; Justice, Law, and Society; and Public Administration and Policy. Founded in 2003, *The Public Purpose* provides a forum to:

- Promote awareness of and engage in dialogue about interdisciplinary policy issues of significance to scholars and professionals within the public affairs community
- Encourage new and unique voices to enter the global discussion of policy and public affairs accomplishments, concerns, and challenges, and
- Showcase the scholarship of SPA graduate students to members of the academic community, policy makers, practitioners, and fellow students

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Message from the Dean

This refereed journal created, managed, and produced by graduate students in the School of Public Affairs (SPA), epitomizes the spirit of civic engagement and commitment to scholarship that lie at the heart of SPA's mission. SPA faculty also played an integral role in the publication of the journal, by helping to identify potential contributions and offering advice to the staff. This partnership between students and faculty is a fine example of the interactive learning environment SPA fosters, an environment where knowledge and skills are shared not only in the classroom but in a variety of extracurricular activities like the publication of this journal.

The articles presented here have gone through a rigorous process of peer review and represent the very best research and analysis that our students have produced over the past year. As you will see, they represent a breadth of topics, approaches, and disciplines that are emblematic of SPA's graduate programs. Our students should be proud of the high quality and professionalism that these articles represent. Our faculty should be proud of how well their efforts in the classroom have succeeded in educating these women and men into the professional norms and standards of our disciplines. And our alumni should be proud of strides the School of Public Affairs continues to make with their support, as this exceptionally high quality publication demonstrates.

It is inspiring to realize that the authors published in this journal are graduate students embarking on public service-oriented careers. Whether they enter the workforce as civil service professionals, serve as advocates for nonprofit organizations, or remain in academia, they have shown through their work that they have the capacity to analyze and understand the intricate workings of government, the justice system, public administration and public policy. We have every reason to expect great things of these authors and their fellow students. I thank them for their scholarly contributions to this journal and the initiative they have shown in creating it.

Dr. William M. LeoGrande
Dean, School of Public Affairs

Message from the Editor

It has been my pleasure to work on the staff of *The Public Purpose* for the past two years. I have had the opportunity to watch it evolve in many ways. Two years ago, we expanded our offerings from a print-only journal to an electronic version, which increased the journal's online presence and overall readership. I have received emails from students across the country seeking to learn more about our journal and our programs at the School of Public Affairs (SPA). The hope is that these efforts will serve to further the journal's visibility. I have also seen other encouraging changes, including a twofold increase in submissions. These are signs that the journal's reputation is growing and that our talented SPA students desire the chance to have their research showcased.

The 2011 journal presents works produced by graduate students with a variety of perspectives, passions, and public pursuits. The articles in this ninth edition cover an array of issues that we face both domestically and internationally. They analyze the implications of immigration reform, a regional prison system, flat and excise taxes, state spending and term limits, Internet privacy issues in China, and even health insurance in Chile. While each author has a distinctive voice and message, collectively their work reinforces my belief that these pressing policy issues are in fact tied to each other in meaningful ways. The journal provides a platform for students to explore these issues and exposes them to the larger academic community at SPA and beyond.

At its essence, *The Public Purpose* provides us with a window to peer into and frame some of the many issues that confront our contemporaries. I hope that when you read this journal, you too will experience a sense of pride in the work of our fellow colleagues. Ideally, this journal will spark a dialogue and move each individual reader to find and define his or her own "public purpose."

Christina Macfarland
Editor-in-Chief

Acknowledgements

The 2011 edition would not have been possible without the assistance of countless dedicated individuals, who gave their time and talent over the past year.

First, the journal's staff would like to express its thanks to the seven superb authors whose work was chosen for publication and who collaborated with our staff during the editorial process: Javier Bronfman, Lysette Kent, Dillon Klepetar, Joshua Linder, Michael Palinkas, Matthew Reges, and Lane Teller.

The staff would also like to extend its gratitude to numerous administrative officials within SPA. Dean William LeoGrande generously provided financial assistance and guidance throughout the year. Associate Dean Meg Weekes and Assistant Dean Jacqueline Linde provided valuable input regarding the publishing process and the year-end event. Matt Bourdon also deserves recognition for his continual involvement with journal.

SPA faculty has also played a crucial role in making the journal a success. Professors Laura Langbein and Alison Jacknowitz served as faculty advisors and were a trusted and helpful source of advice throughout the editorial process. We owe our additional gratitude to Dr. George Guess, Dr. David Pitts, Dr. Sonja Walti, Dr. Tamara Hafner, and Dr. Karen Baehler for improving the quality of submissions through their role as faculty reviewers.

Moreover, we would like to thank our extended staff of peer reviewers, who worked to ensure the quality of submissions: Peter Brusoe, Sarah Fischer, Melissa Grandis, Katherine Jares, Sarah Pettijohn, Melissa Kanaya, Keri Sikich, Kevin Wozniak, and Robert Yavor. I am also immensely thankful for the valuable input that I received from my predecessor, Austin Trantham.

Additionally, we would like to express our appreciation of the 2010-2011 SPA Graduate Student Council. President Lorraine O'Neil Ross and Vice President Holly Davis in particular provided encouragement and advice on numerous matters as did our student activities coordinator, Andrew Toczydlowski.

Finally, I would like to express my deep gratitude to the 2010-2011 editorial board. I am immensely grateful to Evan Fuka who served another year as web designer, to Landin Ryan who reinvigorated the layout design and increased the journal's online presence, to Huafang Li who brought innovative ideas as the managing editor, and to our assistant manager Chris Cantrell who kept us organized and on track. I'd also like to thank Sean Mulligan and Sarah Riczo; this fearless team tackled editing duties that are normally doled out to many more--and, not surprisingly, they did a phenomenal job. And finally, my thanks go out to Kimberly Meyer, who worked selflessly as the associate editor, and who will assume the role of Editor-in-Chief next year. Producing the ninth edition of *The Public Purpose* alongside this extraordinary group of individuals was a genuine pleasure.

Christina Macfarland
Editor-in-Chief

The Amnesty Effect: Evidence from the 1986 Immigration Reform and Control Act

Joshua Linder

Abstract

The 1986 Immigration Reform and Control Act (IRCA) marked one of the biggest changes in the history of U.S. immigration policy. One of the main provisions in the legislation was a legalization program that granted amnesty to undocumented immigrants who could prove they had resided in the U.S. continuously since January 1, 1982. This study evaluates the impact of mass-legalization on the flow of undocumented immigrants across the U.S.-Mexican border by analyzing a monthly time series of Border Patrol apprehensions from January 1977 to December 2000 within the context of a multivariate regression model. In sharp contrast to previous studies that examine the immediate effects of IRCA on illegal immigration, this paper focuses on the long-term impact of the amnesty provision. Controlling for factors that influence the flow of illegal immigrants, including relative economic conditions in the U.S. and Mexico, the level of border enforcement, economic liberalization through trade, and seasonal fluctuations in the demand for agricultural labor in the U.S., I find that the IRCA amnesty program is associated with a decline in the number of border apprehensions. Although using apprehensions as a proxy for the flow of illegal immigrants precludes the analysis from estimating the exact magnitude of this effect, the findings refute unsubstantiated claims that the amnesty program encouraged further illegal immigration.

Introduction

In October 1986, the U.S. Congress passed the Immigration Reform and Control Act (IRCA), and President Reagan signed the legislation into law in the following month. The legislation aimed to curtail the flow of undocumented immigrants to the United States through three mechanisms: sanctions on employers who knowingly hired undocumented workers, increased border enforcement, and an amnesty program for undocumented immigrants already in the United States who met certain provisions. Approximately 3 million undocumented immigrants, including 2.3 million Mexicans, were granted legal permanent resident status under IRCA. It should be noted at the outset that I use the terms *illegal alien, undocumented immigrant, and illegal immigrant* interchangeably.

A considerable debate has arisen in the post-IRCA period over the extent to which IRCA has reduced the flow of undocumented immigrants across the U.S.-Mexican border. The flow of undocumented immigrants is expected to decline if these programs reduce the demand for illegal immigrant workers (and hence their wages) or if potential undocumented immigrants believe it would be more difficult to obtain a job in the United States.[1] Likewise, tighter border security is expected to deter illegal immigration by lowering the probability of a migrant successfully crossing the border. However, more at issue is whether the amnesty provision affected the flow of illegal immigrants in the long-term. This question is addressed by determining whether there were more or fewer illegal entrants in subsequent years than there would have been without the legislation. At the very least, the amnesty program reduced the potential population at-risk to migrate illegally, since nearly half of the newly-legalized immigrants were Mexican residents who traveled to the U.S. periodically in response to the seasonal demand for farm labor.

Opponents of the law argued that amnesty actually encourages illegal entry by setting a precedent for future legalization measures.[2] Furthermore, widespread amnesty creates a snowball effect because relatives attempt to join emigrants who gained legal status. For example, in response to a proposed amnesty bill in 2000, Congressman Lamar Smith urged his fellow lawmakers to heed the lesson of the 1986 IRCA. He claimed that "Amnesty actually precipitates even more illegal immigration, as individuals come to join their amnestied relatives or are encouraged in the belief that if they can just elude the Border Patrol and stay underground for a few years, they will eventually get amnesty themselves."[3] A more recent report on illegal immigration published by the Heritage Foundation echoed a similar sentiment: "As evident from the last amnesty in 1986, illegal aliens will rightfully view the federal government as a serial amnesty machine that will cave once again in 20 years when the illegal immigration population again swells in the United States." Although these claims may have merit, whether they are politically motivated or substantiated by empirical evidence is unclear.

1 Pia M. Orrenius and Madeline Zavodny, "Do Amnesty Programs Reduce Undocumented Immigration? Evidence from IRCA," *Demography 40*(3).

2 Annelise Anderson, "Illegal Aliens and Employer Sanctions: Solving the Wrong Problem," in *Hoover Essays in Public Policy* (Stanford, CA: Hoover Institution, 1986).

3 Lamar Smith, "Lamar Smith Press Conference Statement on Amnesty," Immigration Daily, http://www.ilw.com/.

The debate over amnesty has once again moved to the forefront of American politics, with the current administration continuing to push for immigration reform centered on mass-legalization of all illegal aliens currently in the U.S. Since IRCA is the only example of a large-scale amnesty program in U.S. history, understanding its impact on the long-term flows of undocumented immigrants will be extremely useful to policymakers and interest groups on both sides of the debate.

Previous Literature

Previous research on how IRCA affects the flow of undocumented immigrants has reached mixed conclusions. Controlling for various factors that are expected to affect the migration rate, including relative economic conditions and the level of border enforcement, Orrenius and Zavodny (2003) find that apprehensions of persons attempting to illegally cross the U.S.-Mexico border declined immediately following passage of the IRCA but returned to normal levels during the period when illegal immigrants could file for amnesty and the years thereafter. Their findings suggest that while the amnesty program may not have reduced undocumented immigration, it did not encourage it either. Using data collected from U.S. migrants interviewed in seven Mexican communities from 1986-1989, Donato, Durand, and Massey (1992) carried out a set of time-series experiments that examined changes in migrants' behavior before and after the passage of IRCA. They similarly find that there was no consistent change in either direction in the probability of making a first illegal trip to the United States. Woodrow and Passell (1990) use a residual methodology to estimate a post-IRCA measurement of the number of undocumented immigrants included in the 1988 Current Population Survey (CPS). After identifying the portion of the undocumented population who came after the IRCA was enacted, they conclude that the annual change in the number of undocumented immigrants was not significantly different from that prior to IRCA.

In contrast, several studies using border apprehensions data from the Immigration and Naturalization Services (INS) find that IRCA was successful in reducing the volume of illegal Mexican migration. Controlling for wages and unemployment levels in the United States as well as unemployment rates, income levels, and the size of the migrant-aged population in Mexico, Bean et al. (1990) conclude that in the three years after the IRCA amnesty program was passed, border apprehensions were 24 percent below the level anticipated in the absence of IRCA. Using a similar model, White, Bean, and Espenshade (1990) find that the legalization provision of IRCA contributed to a 17 percent decline in the flow of illegal immigrants during the 23-month period after it was enacted. Accordingly, all empirical studies that isolate the impact of amnesty on the flow of illegal immigrants find either a negligible effect or modest decline. A thorough review of the literature did not reveal any studies that indicate amnesty increased the flow of illegal immigrants across the U.S.-Mexico border.

Another shared characteristic of IRCA academic literature is that most studies only cover a short time period; analysis of the sample period rarely extends past 1989. This imposes several limitations on their findings. First, the application period for the legalization program did not end until April 1988. Detecting a decline in illegal immigration during this period cannot be attributed to the amnesty program because it may also be related to the unique

aspects of the application process. The decline may also reflect the immediate impact of reducing the population of potential illegal immigrants by removing those who apply for amnesty. If this impact dissipates in subsequent years, then short-term estimates do not capture the true affect of amnesty on the flow of undocumented immigrants. Moreover, restricting analysis to the years immediately following passage of the act fails to consider how mass-legalization might affect the flow of illegal immigrants in the long-term.

Explanation of Variables

In this paper, I develop a multivariate statistical model to estimate the long-term effect of the amnesty component of IRCA on the flow of undocumented immigrants, using data from 1977-2000. Following previous empirical studies on illegal immigration, I rely on INS apprehensions data as a proxy for inflows of undocumented immigrants into the United States. I also lean heavily on previous research to develop a set of control variables that are expected to affect migration rates. An additional variable for *trade openness* is introduced to capture the affect of globalization and trade liberalization on illegal immigration.

Why Analyze Apprehensions Data?

Research on illegal U.S. immigration is confounded by one unavoidable reality – the number of undocumented immigrants entering the United States is unobserved and therefore not precisely known.[4] This forces analysts to rely on proxy indicators, such as border apprehensions, and a variety of indirect estimates that try to measure the flow of undocumented immigrants into the U.S. However, White et al. (1990) contend that "Apprehensions data are relevant to the question of whether illegal immigration has risen or fallen over a given period of time because they may in some sense be an indicator of the number of border crossing attempts and successful entries into the country by illegal immigrants." In other words, border apprehensions are a suitable proxy because the volume of apprehensions is highly correlated with the total flow of undocumented immigrants. Espenshade (1995) examined the nature of this correlation and concluded that the simple correlation between the number of apprehensions and the volume of illegal immigration is about 0.90 and the size of the illegal immigrant flow is approximately 2.2 times the number of border apprehensions. This suggests that the signs of regression coefficients in models that regress apprehensions on a set of explanatory variables will capture the direction of the effects of changes in variables on flows of illegal immigrants, but the exact magnitude of these effects cannot be identified. Thus, a disadvantage to using apprehensions data as a proxy indicator for illegal immigration is that interpretation of regression results is severely limited.

The number of apprehensions at the U.S.-Mexico border is, of course, an imperfect proxy for the flow of illegal immigrants. First off, border apprehensions data do not account for illegal aliens who entered the U.S. legally and then overstayed their visas. Visa overstays are believed to account for about half of the unauthorized aliens present in the United States, although among Mexicans and Central Americans, the share is estimated to be between

4 Thomas J. Espenshade, "Using INS Border Apprehension Data to Measure the Flow of Undocumented Migrants Crossing the U.S.-Mexican Border," *International Migration Review, 20* (1994).

16% and 26%.[5] Additionally, because apprehensions data measure events and not people, it is possible to include repeat apprehensions for the same individual. This issue is problematic because undocumented immigrants are likely to keep trying to enter the United States until they succeed, no matter how many times they are apprehended.[6] Furthermore, the number of apprehensions is directly related to the level of Border Patrol effort. An increase in apprehensions may reflect stepped-up Border Patrol enforcement rather than a true increase in the flow of illegal immigrants. I control for this possibility by including a measure of Border Patrol person-hours in the set of explanatory variables. This also has the added benefit of isolating the impact of the IRCA amnesty program from provisions that increased enforcement activities.

Variables and Data

The variables used in the regression analysis and the corresponding data sources are listed in Table 1. The primary source of data is unpublished INS files on monthly Border Patrol activities. The INS reports statistics on two types of U.S. Border Patrol Activities: "linewatch" activities, which occur at international borders, and "non-linewatch" activities, which occur in the interior of the United States.[7] Linewatch apprehensions are more relevant to the study of illegal immigration because they reflect the moment in time that individuals attempt to cross the border. Therefore, I use monthly data on the number of individuals apprehended by U.S. Border Patrol officers on linewatch duty at the U.S.-Mexican border as my dependent variable. Since the level of enforcement, measured as the number of person-hours devoted to linewatch duty at the U.S. Mexican border, and the number of apprehensions which occur in the interior of the U.S are expected to affect the number of border apprehensions, they are modeled as control variables.

In addition, labor demand for low-wage farm-workers in California and other parts of the American Southwest is highly seasonal, increasing in summer months and falling during the winter, which is likely to create seasonal variations in the tendency to migrate illegally to the United States.[8] Apprehensions respond to seasonal fluctuations the same way, implying that the data do not exhibit a linear relationship. I correct for the non-linear nature of the data, by taking the natural log of each INS measure. A set of month dummy variables is also added to the model to control for seasonal patterns. Since the other variables in the model do not have a seasonal pattern, there is no reason for allowing the systematic seasonal component in apprehensions to be stochastic.[9]

The number of interior apprehensions lagged one time period is included as an

5 Orrenius and Zavodny, "Evidence from IRCA."
6 Barry Edmonston, Frank D. Bean, and Jeffrey S. Passel. "Perceptions and Estimates of Undocumented Migration to the United States," in *Undocumented Migration to the United States: IRCA and the Experiences of the 1980s*, ed. Barry Edmonston, Frank D. Bean, and Jeffrey S. Passel (Washington, DC: Urban Institute Press, 1990).
7 Gordon H. Hanson and Antonio Spilimbergo, "Illegal Immigration, Border Enforcement, and Relative Wages: Evidence from Apprehensions at the U.S.-Mexico Border," *American Economic Review,* 89 (1999).
8 Michael J. White, Frank D. Bean, and Thomas J. Espenshade, "The U.S. 1986 Immigration Reform and Control Act and Undocumented Immigration to the United States," *Population Research and Policy Review, 9* (1990).
9 Hanson and Spilimbergo, "Illegal Immigration."

explanatory variable instead of current interior apprehensions. The reason for this is that illegal aliens of Mexican descent that are apprehended in the interior of the United States get deported to the Mexican side of the border, where they form a ready pool of prospective migrants. It is expected that these individuals will then try to re-enter the country immediately. The lag is necessary to capture this effect because it accounts for the time it takes an apprehended illegal alien to be deported.

The size of the young-adult Mexican population is also included as an explanatory factor in the analysis since it is a proxy for the population at risk of migrating to the United States in undocumented status.[10] It is expected that the larger the size of this population, the greater the flow of undocumented immigrants across the border. Furthermore, White et al. (1990) suggest that singling out the Mexican population for the at-risk group is appropriate because INS statistics compiled between 1977 and 1988 indicate that more than 97 percent of all apprehensions at the U.S.-Mexico border were of persons born in Mexico. I take the natural log of this measure to reflect the non-linear trend of population growth.

Relative economic conditions in the United States and Mexico are also likely to affect the rate of undocumented migration across the border. Greater economic opportunities in the U.S. and/or worsening of circumstances in Mexico are expected to encourage more illegal immigration. This is reflected in the model by controlling for the relative wage ratio between the two countries, the U.S. unemployment rate, and the average monthly exchange rate (in Mexican pesos per U.S. dollar). The wage ratio is calculated as the U.S. hourly wage in U.S. dollars, deflated by the U.S. Consumer Price Index (CPI), divided by the Mexican hourly manufacturing wage in Mexican pesos, deflated by the Mexican CPI. However, there is an alternative measure of the U.S. real wage. If prospective migrants plan to support family members in Mexico by remitting a portion of their earnings, they may evaluate U.S. earnings in terms of its purchasing power in Mexico, rather than in terms of its purchasing power in the United States.[11] To control for this possibility, a second wage ratio is constructed that uses the real peso U.S. wage (U.S. nominal wage multiplied by the peso-dollar exchange rate, divided by the Mexican CPI) instead of the real U.S. wage. I test separate models for each wage ratio variable – Model 1 uses the original wage ratio, while Model 2 uses the second wage ratio just described. I am unable to create a ratio for levels of unemployment because reliable data are not available for the earlier parts of the sample period. The U.S. producer price index for crude oil is also included because of the significance of oil production in the Mexican economy. Most notably, a decline in oil prices in the 1980s triggered Mexico's worst economic crisis since the Mexican Revolution in 1910.[12]

Some combinations of the variables in this section were also included in the models of nearly all previous IRCA studies; however, a common omission is the degree of trade and investment liberalization. Economic theory suggests that trade and migration may be directly

10 Thomas J. Espenshade, "Does the Threat of Border Apprehension Deter Undocumented US Immigration?" *Population and Development Review, 20* (1994).

11 Hanson and Spilimbergo, "Illegal Immigration."

12 Richard C. Jones, "Immigration Reform and Migrant Flows: Compositional and Spatial Changes in Mexican Migration after the Immigration Reform Act of 1986," *Annals of the Association of American Geographers, 85* (1995).

related, though the direction of this relationship is unproven. According to the Mundell model, equalization of factor prices through international trade reduces the incentive for capital or labor to move across national boundaries; thus, international trade is considered a substitute for factor movements, including the movement of people.[13] Proponents of the 1993 North American Free Trade Agreement (NAFTA) based their arguments that the deal would raise Mexican living standard and wage levels, while also reducing incentives to migrate, on the economy theory underlying the Mundell model. However, the logic of the Mundell model is contingent on several important assumptions. Schiff (1996) demonstrated that if some of the assumptions about economies of scale are relaxed, trade and migration are more likely to be complements. Other assumptions of the Mundell model are undermined when there are sector-specific technological differences between trading partners and when potential migrants are relatively low-skilled and have low earning power. Consequently, increased trade liberalization, especially as brought on by NAFTA, may have encouraged additional illegal immigration. To control for either of these possibilities I include a proxy for trade openness in Mexico, defined as total trade (imports plus exports) divided by GDP.

Lastly, there is a time variable to capture any long terms trends and two IRCA dummy variables. The first dummy is for the application period, Nov. 1986 to April 1988, while the second dummy represents the entire post-IRCA period from Nov. 1986 onwards. It is important to control for the application period because there may have been different incentives for undocumented immigrants while they were still eligible to apply.

13 Andres Solimano, "International Migration and the Global Economic Order," *World Bank Working Paper* (2001).

Table 1. Variable names, definitions and sources of data.

Variable Name	Definition	Data Source
Dependent Variable		
LN_APPR	Natural log of monthly linewatch apprehensions along the U.S.-Mexican border	Unpublished field reports from the INS compiled by Professor Gordon Hanson of UCSD
Predictor Variable		
POSTIRCA	Effect of IRCA amnesty provision	Dummy variable (= 1 for Nov 1986 and all subsequent months)
Control Variables		
TREND	Effect of long term trends	Monthly (= 1 for Jan 1977 and increases to = 288 for Dec 2000)
IRCAFILING	Effect of IRCA amnesty provision during application period	Dummy variable (= 1 for Nov 1986 to April 1988)
LN_ENFHRS	Natural log of monthly U.S. Border Patrol hours devoted to linewatch activities	Unpublished field reports from the INS compiled by Professor Gordon Hanson of UCSD
WAGERATIO1	Ratio of hourly wage rate in U.S. non-agricultural sector (deflated by U.S. CPI) to hourly earnings in Mexican manufacturing sector (in Mexican pesos, deflated by Mexican CPI)	U.S. Bureau of Labor Statistics; International Labor Organization
WAGERATIO2	Ratio of hourly wage rate in U.S. non-agricultural sector (in Mexican pesos, deflated by Mexican CPI) to hourly earnings in Mexican manufacturing sector (in Mexican pesos, deflated by Mexican CPI)	U.S. Bureau of Labor Statistics; International Labor Organization
USUNEMPLOY	Total U.S. unemployment rate (percent)	U.S. Bureau of Labor Statistics
OIL	U.S. PPI for crude oil	U.S. Bureau of Labor Statistics
EXRT	Real exchange Rate between Mexico and the U.S. (pesos per $)	IMF International Financial Statistics
TRADE	The ratio of imports plus exports divided by GDP (measured annually and averaged over 12-month period)	IMF International Financial Statistics
LN_MEXPOP	Natural log of Mexican population 15-34 years of age (in millions, measured annually and averaged over 12-month period)	World Bank
LN_LAGINTAPPR	Natural log of monthly apprehensions of illegal aliens in the interior United States (lagged one month)	Unpublished field reports from the INS compiled by Professor Gordon Hanson of UCSD
JAN-NOV	Monthly dummy variables for season labor demand	Each monthly dummy = 1 for that month and =0 elsewhere

Method

I regress the natural log of border apprehensions on the predictor and explanatory variables listed in Table 1. Separate models are estimated for each wage ratio; the other variables do not change. The basic research design follows that of a single interrupted time series – measures of the outcome (dependent) variable, repeated for several time periods before a policy or program change, represent the counterfactual pretreatment status quo; measures of the same variable, repeated for several time periods after the change, are taken to reveal the impact of the change.[14] The specification I use does not include an interaction term for the predictor variable and time because there is no reason to expect the IRCA amnesty program would alter the trend of illegal immigration as time increases (i.e. there is an impact on the intercept but not on the slope). However, before an estimating equation can be derived, there are several issues that affect non-experimental designs that need to be addressed.

In order for regression estimates to be valid, the explanatory variables and error term must be independent of each other and there cannot be any reciprocal causation between the explanatory variables and the dependent variable. Violation of the former assumption reflects the presence of omitted variable bias (OVB), while violation of the latter indicates simultaneous equation bias. By definition, dual causality also implies that the explanatory variable(s) and error term will no longer be independent. Therefore, the presence of either OVB or SEB results in biased, internally invalid estimates of program impact. Valid estimation also requires that the dependent and explanatory variables be free of non-random measurement error (NRME). Removing the systematic component of error in INS data with dummy variables for each month satisfies this condition.

A central issue in this study is that border apprehensions are endogenous if increased flows of illegal immigrants cause a simultaneous increase in the level of border enforcement. Additionally, shocks to enforcement hours may be correlated with unobserved shocks to apprehensions, indicating that OVB may be a problem as well. Hanson and Spilimbergo (1999) describe a potential scenario where this occurs: "Suppose, for instance, that the INS acquires new enforcement technology - this could lead to a simultaneous increase in enforcement hours to implement the technology, and in apprehensions as the technology takes effect."

To correct for the effects of OVB and the endogeneity of enforcement hours, two separate equations are estimated using instrumental variables (IV) analysis. Following Orrenius and Zavodny (2003) and Hanson and Spilimbergo (1999), I instrument for border enforcement in the first stage equation with U.S. government expenditures on defense as the identifying variable. The defense budget is related to the number of enforcement hours because the budget allocates a set amount of fiscal resources to each agency, but this is not expected to directly influence the flow of undocumented immigrants. Although there is no consensus about what distinguishes whether the first stage IV equation is a "poor" fit to the data or a "good" one, the theoretical plausibility of the identifying variable and high R^2 (unreported) suggest that it is a suitable estimation. Thus, I use the following combined estimating equation:

14 Laura Langbein and Claire L. Felbinger, *Public Program Evaluation Guide: A Statistical Guide* (Armonk, New York: M.E. Sharpe Inc., 2006).

$$(1)\ \ln ENFHRS_t = a + b_1 POSTIRCA_t + b_2 TREND_t + b_k Zk_t + cW_t + e'_t$$

$$(2)\ln APPR_t = a + c_1 POSTIRCA + c_2 TREND + d\ln ENFHRS\hat{} + c_k Zk_t + e_t$$

$$\textit{where}\ \ln ENFHRS\hat{} = a + b_1 POSTIRCA_t + b_2 TREND_t + b_k Zk_t + cW_t$$

Here, ln*ENFHRS*^ is the instrumental variable, W_t is the identifying variable (U.S. defense budget), Zk_t is a vector of all other explanatory variables from Table 1, and e_t is a stochastic error term.

In principle, equation (2) can be estimated by OLS; however, if there is serial correlation (autocorrelation) in the error term OLS will produce biased estimates of coefficients and standard errors. The presence of non-independent observations is particularly likely in time-series data, so the problem of autocorrelation is to be expected. Despite controlling for time with a trend variable, the Durbin-Watson test for OLS estimation indicated the presence of serial correlation. Therefore, I estimate the equation using a first-order autoregressive model; unreported Durbin-Watson test results confirm the AR(1) correction sufficiently captures the serial correlation. By lagging the dependent variable, the AR(1) model also embeds an additional correction for SEB and OVB in the design. Robust standard errors are used to correct for heteroskedasticity in the error term.

Descriptive Results

Apprehensions have clearly been on the rise during the 24-year sample period. The descriptive statistics in Table 2 indicate that there was an average of nearly 48,000 apprehensions per month in the 118 months (approximately 9 years) prior to IRCA, compared with almost 76,000 per month in the 152 months (12.5 years) after the application period for legalization under the IRCA ended. There was an average of 59,000 apprehensions per month during the 18-month application period. The number of Border Patrol hours devoted to linewatch activities follow a similar pattern, more than doubling in size from an average of 161,000 per month prior to IRCA to an average of 362,000 per month after the amnesty application deadline. This massive increase is not surprising because it reflects the provisions of the IRCA designed to increase border enforcement capabilities. Specifically, the number of Border Patrol personnel increased from 3,687 in fiscal year 1986 to 4,669 in fiscal year 1988.[15] On the other hand, the number of apprehensions in the interior of the United States drops from an average of 32,000 per month prior to IRCA, to around 28,000 per month in the post-IRCA period. Since raids on businesses comprise one of the larger components of interior apprehensions, the drop may signal that the employer sanctions provision of IRCA was not strictly enforced.

The statistics in Table 2 also indicate that U.S. and Mexican real wages, as well as the U.S. unemployment rate and price of crude oil, are declining over the sample period. The substantial drop in the Mexican real wage rate and the price of crude oil are particularly telling because they represent deteriorating economic conditions in Mexico. Coupled with a rising

15 White, Bean, and Espenshade, "1986 Immigration Reform."

exchange rate, this inflates the wage ratio when the constant peso U.S. wage is the numerator. Additionally, the "at-risk" Mexican population exhibits steady growth over the sample period, with an average of 23 million people before IRCA compared to an average of nearly 33 million people in the post-IRCA period. Likewise, the average trade ratio is twice as large in the post-IRCA period relative to the period before the legislation. This provides empirical evidence for using "trade openness" to represent the forces of globalization and the increase in economic liberalization induced by NAFTA in the early 1990s.

Table 2. Sample means

	Total Period 1/77-12/00	**Pre IRCA 1/77-10/86**	**IRCA Appl. Period 11/86-4/88**	**Post-IRCA 5/88-12/00**
N	288	118	18	152
Apprehensions (in thousands)	63.23 (28.78)	47.76 (16.98)	58.93 (14.12)	75.74 (31.34)
Enforcement (hours, in thousands)	269.63 (176.52)	161.24 (17.65)	200.22 (20.99)	361.99 (201.46)
U.S. real wage ($)	8.08 (0.38)	8.41 (0.35)	8.05 (0.07)	7.82 (0.18)
Mexican real wage (pesos)	25.42 (6.45)	31.14 (5.74)	23.93 (6.22)	21.16 (2.22)
U.S. Unemployment rate	6.39 (1.51)	7.49 (1.36)	6.16 (0.57)	5.56 (1.11)
Price of Crude Oil (per barrel)	63.35 (21.59)	73.60 (25.86)	52.54 (5.40)	56.68 (14.97)
Real Exchange Rate (pesos per $)	3.49 (3.34)	1.21 (0.61)	1.52 (0.51)	5.49 (2.86)
Trade Openness Ratio	0.38 (0.15)	0.25 (0.03)	0.34 (0.03)	0.49 (0.13)
Mexican Population (ages 15-34, in millions)	28.52 (5.17)	23.138 (2.08)	27.53 (0.50)	32.81 (2.47)
Interior Apprehensions (in thousands)	29.55 (10.25)	32.09 (12.46)	28.87 (8.59)	27.67 (7.91)

Note: Standard deviations are in parentheses.

Regression Results

It is important to recall that using apprehensions data as a proxy for the flow of undocu-

mented immigrants limits the interpretation of coefficients to inferences about directional impact only. As Table 3 indicates, the post-IRCA period is associated with a decline in the number of border apprehensions in both models. The dummy variable for the amnesty application period is also associated with a decrease in border apprehensions in both models. This suggests that the amnesty provision of IRCA may have actually been responsible for a reduction in illegal immigration when other factors that affect migration rates are controlled for. The relative decline in apprehensions during the application period is consistent with previous research (e.g. Bean et al., 1990 and White et al., 1990). However, the negative association between apprehensions and the long-term impact of the IRCA amnesty program is a new finding. Orrenius and Zavodny (2003) is the only other empirical analysis that tested for a long-term impact of IRCA, and they found that the post-IRCA period (5/88-12/96) to be associated with an increase in apprehensions, albeit the coefficient is not statistically significant and is actually very close to zero. On the contrary, I find that there are fewer apprehensions in the post-IRCA period (1986-2000) than there would have been without the amnesty program.

Inability to estimate the magnitude of IRCA's impact on the flow of undocumented immigrants makes interpreting this result inherently difficult and limits its substantive significance. This problem also makes it harder to theorize why amnesty may have had this type of effect. The most plausible explanation is that the legalization program removed a large number of individuals from the "at-risk" population. This is expected to reduce the number of apprehensions because the same individuals who would have been traveling between Mexico and the U.S. illegally are now able to cross the border freely in either direction. In this context, the amnesty provision did not alter the trend of illegal immigration; instead, it shifted the intercept of the trend line down, reflecting a smaller "at-risk" population.

The results also indicate that enforcement, instrumented with U.S. defense spending, is positively associated with apprehensions in both specifications of the model. Since both variables are measured in log form, the coefficient in Model 1 can be interpreted to mean that a 10 percent increase in Border Patrol hours is associated with a .57 percent increase in the number of border apprehensions. The effect in Model 2 is about the same. However, the coefficients are not statistically significant and the 95% confidence intervals cannot be used to infer a directional impact because the ranges span both positive and negative numbers. Another way to interpret this result is that it may imply enforcement is not an effective deterrent for illegal immigration. Espenshade (1994) also found that enforcement had a negligible impact on apprehensions and concluded that the threat of border apprehension is not likely to be a strong deterrent for migrants who have made it as far as the U.S.-Mexican border. Similarly, Donato et al. (1992) cite anecdotal evidence from case study interviews that suggests none of the interviewees were prevented from entering the United States when they wanted to go. Two possible conclusions can be drawn from the enforcement discussion – the theoretical relationship between the probability of apprehension and the flow of undocumented immigrants is flawed, and/or enforcement efforts are undermined by the ability of illegal immigrants to evade Border Patrol agents.

The lag of interior apprehensions is also positively associated with border apprehensions, with a 10 percent increase in interior apprehensions associated with a 1.65 percent increase in apprehensions in Model 1, and a 1.57 increase in apprehensions in Model 2. This result is consistent with theoretical expectation that illegal aliens of Mexican descent who are apprehended in the interior of the United States are likely to attempt re-entry as soon as they are deported. Results in Table 3 also indicate that the degree of trade openness is positively associated with apprehensions in both models. Although interesting, this finding does not come as a great surprise. A wide body of empirical evidence on how NAFTA encourages illegal immigration (e.g. Markusen and Zahniser, 1997) supports Schiff's (1996) theory that under certain conditions, trade and migration will act as complements.

The only difference between the two models is observed in the alternative wage ratio measures. Although the coefficient for the wage ratio (constant U.S. wage in the numerator) is much larger in Model 1, it is not statistically significant. On the other hand, the coefficient for the wage ratio in Model 2 (constant peso U.S. wage in the numerator) is positive and statistically significant at the 0.05 level. This can be interpreted to mean that an increase in the relative Mexican earning power of U.S. currency is associated with an increase in the flow of undocumented immigrants. Hanson and Spilimbergo (1999) also find that apprehensions are more sensitive to Mexican wages than U.S. wages and posit that this may be due to the relative volatility of the Mexican economy, giving Mexican wages greater weight in the illegal immigration decision. As expected, the exchange rate is negatively associated with apprehensions in both models, but it is only statistically significant in Model 2.

Though unreported, the month dummy variables are all statistically significant, which suggests they captured the seasonal variations in apprehensions. None of the other explanatory variables are statistically significant in either model.

Table 3. AR(1) Regression Results for the Natural Log of Monthly Apprehensions at the U.S. Mexico-Border, 1977-2000.

Model 1 – estimated using wageratio1			
Variable	**b**	**SE**	**95% CI**
POSTIRCA	-.318***	.090	(-.495 & -.140)
IRCAFILING	-.156**	.067	(-.288 & -.024)
TREND	.010	.009	(-.006 & .027)
LN_ENFHRS^	.057	.152	(-.241 & .356)
WAGERATIO	.410	.346	(-.269 & 1.088)
USUNEMPLOY	.005	.023	(-.040 & .049)
OIL	-.001	.001	(-.004 & .001)
EXRT	-.062	.041	(-.143 & .018)
TRADE	1.303**	.536	(.251 & 2.354)
LN_MEXPOP	-.251	.337	(-3.401 & 2.478)
LN_LAGINTAPPR	0.165***	.056	(.055 & .275)
Constant	26.708	33.834	(-39.604 & 93.021)
Adjusted R	0.891		
N	288		

Model 2 – estimated using wageratio2			
Variable	**b**	**SE**	**95% CI**
POSTIRCA	-.291***	.096	(-.480 & -.102)
IRCAFILING	-.168**	.070	(-.306 & 0.030)
TREND	.012	0.008	(-.003 & .029)
LN_ENFHRS^	.060	.147	(-.227 & .348)
WAGERATIO2	.023**	.012	(.001 & .046)
USUNEMPLOY	.002	.022	(-.040 & .045)
OIL	-.001	.001	(-.003 & .001)
EXRT	-.069*	.041	(-.149 & .011)
TRADE	1.141**	.569	(.024 & 2.258)
LN_MEXPOP	-.334	.321	(-.963 & .295)
LN_LAGINTAPPR	.157***	.055	(.049 & .264)
Constant	34.967	32.146	(-28.046 & 97.965)
Adjusted R	.922		
N	288		

*p<.10. **p<.05. ***p<.01

Note: Month dummy variables are included in both models but are not shown.

Discussion and Conclusion

This study has developed and estimated a statistical model to analyze the long-term effect of the IRCA amnesty program on border apprehensions over the period 1977 to 2000. The

analysis diverges from previous research on IRCA by examining a much longer post-IRCA period. The results show that the amnesty program is associated with a decline in the number of apprehensions at the U.S.-Mexican border in the fourteen years since it was enacted. The amnesty impact also does not appear to dissipate over time. The same two models were estimated in two-year intervals of the post-IRCA period (i.e., they were estimated for the time period 1/77-11/88, then for 1/77-11/90, 1/77-11/92, and so forth). Results are not reported, but the post-IRCA dummy, which captures the effect of the amnesty program, was statistically significant and associated with a decline in the number of apprehensions in every model. The empirical evidence from this analysis implies that amnesty programs do not encourage illegal immigration, contrary to the vigorous claims of some critics of amnesty programs. However, refuting this claim should not be misconstrued as tacit support for a widespread amnesty program. In no way have I endorsed mass-legalization as sound public policy. This analysis does not consider the potential costs and other financial distortions that are likely to accompany a massive amnesty plan. Nor does it consider how this might affect different sectors of the U.S. economy, not to the mention the strains it would place on Social Security. A true assessment of the overall impact of an amnesty program requires a highly detailed cost/benefit analysis.

Another major finding in this study is that the level of border enforcement does not affect the number of border apprehensions. From a public policy perspective, this suggests that allocating additional funds to border enforcement activities may not be an efficient use of public resources; rather, diverting funds to other types of deterrent strategies may have a greater impact on the flow of illegal immigrants. However, this should not be misinterpreted as a call to reduce Border Patrol funding, either. First off, border enforcement was not the main predictor variable being examined in this study and may require another model specification to fully capture its effect on apprehensions. Second, an increasingly large share of Border Patrol resources has been devoted to drug interdiction.[16] To the extent drug interdiction is a higher priority than apprehending illegal immigrants for certain Border Patrol officers, the increase in enforcement hours may not reflect an increase in the hours devoted to linewatch apprehension activities. This is one possible explanation for the non-finding on border enforcement.

The other significant finding from this study is that the constant peso U.S. wage ratio and trade liberalization are both associated with an increase in border apprehensions. The latter result reflects that NAFTA may have done more harm than good to the Mexican economy. Critics of NAFTA claim that the trade agreement created a need for intercontinental dependency in Mexico, which resulted in fewer job opportunities and lower wages. Consequently, there were higher levels of illegal immigration. The findings for the constant peso U.S. wage ratio are based on a similar concept: economic volatility in Mexico contributes to border apprehensions. Taken together, these results indicate that economic conditions in Mexico have the greatest impact on the flow of undocumented immigrants. Improving the Mexican economy may be the most effective and efficient deterrent strategy for illegal immigration.

16 Espenshade, "Threat of Border Apprehension."

Some limitations regarding my results warrant discussion, particularly in the research design. Although defense spending provided a rare opportunity to perform IV analysis, relying on an IV as a cure-all for OVB and SEB can be problematic. In a scenario where defense spending is actually somehow related to border apprehensions, the IV will have more random error relative to the original variable, thereby increasing rather than reducing threats to internal validity.

There is also some concern about the statistical procedures used to estimate the regression equation. The first-order autoregressive model reduces serial correlation; however it does not eliminate it completely. The Durbin Watson test statistic for this model was barely above the accepted threshold for evidence of no serial correlation, which suggests that the AR(1) term did not fully remove the serial correlation. As an alternative estimating procedure to correct for serial correlation, I could have used first-order differences. Transforming each variable into a difference reduces the threat of serial correlation because the differences are usually independent and also reduces the threat of OVB. The disadvantage, of course, is that the variables are no longer in their original firm and may be harder to interpret. A possible solution would be to estimate the equation using log-first differences so that all variables could be interpreted on a similar scale. Nevertheless, the debate on illegal immigration is not going anywhere and is sure to require further analysis on amnesty programs as well as other deterrent strategies for illegal immigration.

References

Anderson, Annelise. "Illegal Aliens and Employer Sanctions: Solving the Wrong Problem." In *Hoover Essays in Public Policy*. Stanford, CA: Hoover Institution, 1986.

Beane, Frank D., Thomas J. Espenshade, Michael J. White, and Robert F. Dymowski. "Post-IRCA Changes in the Volume and Composition of Undocumented Migration to the United States." In *Undocumented Migration to the United States: IRCA and the Experience of the 1980s*, ed. Frank D. Bean, Barry Edmonston, and Jeffrey S. Passel, 111-158. Washington, DC: Urban Institute Press, 1990.

Donato, Katharine M., Jorge Durand, and Douglas S. Massey. "Stemming the Tide? Assessing the Deterrent Effects of the Immigration Reform and Control Act," *Demography 29*(2): 139-157.

Edmonston, Barry, Jeffrey S. Passel, and Frank D. Beane. "Perceptions and Estimates of Undocumented Migration to the United States." In *Undocumented Migration to the United States: IRCA and the Experience of the 1980s*, ed. Frank D. Bean, Barry Edmonston, and Jeffrey S. Passel, 11-33. Washington, DC: Urban Institute Press, 1990.

Espenshade, Thomas J. "Does the threat of border apprehension deter undocumented US immigration?" *Population and Development Review, 20*(4): 871-892.

---. "Using INS Border Apprehension Data to Measure the Flow of Undocumented Migrants Crossing the U.S.-Mexico Frontier." *International Migration Review, 29*(2): 545-565.

Hanson, Gordon H. and Antonio Spilimbergo. "Illegal Immigration, Border Enforcement, and Relative Wages: Evidence from Apprehensions at the U.S.-Mexico Border." *American Economic Review, 89*: 1337-1357.

Jones, Richard C. "Immigration Reform and Migrant Flows: Compositional and Spatial Changes in Mexican Migration After the Immigration Reform Act of 1986." *Annals of the Association of American Geographers, 85*(4): 715-730.

Langbein, Laura and Claire L. Felbinger. *Public Program Evaluation: A Statistical Guide.* Armonk, NY: M.E. Sharpe, Inc., 2006.

Markusen, James R. and Stephen Zahniser. "Liberalization and Incentives for Labor Migration: Theory with Applications to NAFTA." In *Trade and Factor Mobility*, ed. Jamie de Melo, Riccardo Faini, and Klaus F. Zimmerman, 263-294. London, Cambridge University Press, 1999.

Mayer, Matt A. *Controlling Illegal Immigration: State and Local Governments Must Do More*. Washington, DC: The Heritage Foundation, 2009.

Orrenius, Pia M. and Madeline Zavodny. "Do Amnesty Programs Reduce Undocumented Immigration? Evidence from IRCA." *Demography, 40*(3): 437-450.

Schiff, Maurice. "South-North Migration and Trade: A Survey." *Policy Research Working Paper,* The World Bank, 1996.

Smith, Lamar. "Lamar Smith Press Conference Statement on Amnesty." Immigration Daily, http://www.ilw.com/.

Solimano, Andres. "International Migration and the Global Economic Order: An Overview." *Policy Research Working Paper,* The World Bank, 2001.

White, Michael J., Frank D. Bean, and Thomas J. Espenshade. "The U.S. 1986 Immigration Reform and Control Act and Undocumented Immigration to the United States. *Population Research and Policy Review, 9*(1990): 93-116.

Woodrow, Karen.A., and Jeffrey S. Passel. "Post-IRCA Undocumented Immigration to the United States: An Assessment Based on the June 1988 CPS." In *Undocumented Migration to the United States: IRCA and the Experience of the 1980s*, ed. Frank D. Bean, Barry Edmonston, and Jeffrey S. Passel, 11-33. Washington, DC: Urban Institute Press, 1990.

Health Insurance Choice, Moral Hazard and Adverse Selection:
A Study of the Chilean Case Using Panel Data

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Abstract

Using panel data from Chile's National Socio Economic Characterization Survey 1996-2001-2006, this article examines health insurance choice and its dynamics. The article takes advantage of the panel data to examine the dynamics and determinants of insurance change. Evidence indicates that private insurance is losing customers to the public sector. Two analyses are undertaken in the article using logistic regressions. For each of the three years studied, the paper looks at insurance choice and its determinants. Income seems to be highly important in determining the choice, as well as age, education, gender, geographical location and health shocks. Evidence of moral hazard and adverse selection was found in the longitudinal and cross sectional analysis. The results of this research are aligned with most of the previous investigations done on Chile's health insurance system and advance previous knowledge on the topic by including the dynamism that panel data permits.

Introduction

Since the enactment of the 1981 Decree Number 3 the Chilean health system has changed dramatically, turning into a mixed system of public and private healthcare options. Since the early 1920's, workers have been mandated to contribute part of their income to the national health system via mandatory worker insurance. Initially, healthcare was provided through a network of public hospitals and centrally administrated public health providers. However, during the Pinochet government (1973-1990), healthcare was dramatically reformed to favor the development of a private health sector in order to improve efficiency in health delivery and grant individual choice. Competition among providers was expected to improve the overall performance of the system.

The health reform created new institutions called "Instituciones de Salud Privada" (ISAPRES), private health institutions capable of providing health insurance and health care. Decree number 3 permitted workers the choice of whether to make the mandatory health insurance contributions directly to the government insurance called "Fondo de Salud Pública" (FONASA) or the newly created ISAPRES.

The mandatory contribution for health insurance equals 7% of taxable income with a cap of approximately USD$190 a month. This contribution can be utilized to acquire insurance through FONASA, which entitles individuals to get health care from public hospitals and public health providers at different co-pay levels, depending exclusively on their income. Co-pays in the public sector range from 0% to 50% of a subsidized public set price on health care service. Individuals' insured by FONASA can also receive health services from private providers but at a much higher cost, since the reimbursement cap is based on government set prices. Workers can purchase health insurance from ISAPRES with their 7% of mandatory contribution, in parallel to FONASA affiliation; however, ISAPRES differs from FONASA by offering a wider range of insurance plans with different prices and benefits. Prices charged by ISAPRES are determined by individual risk factors and desired benefits. Individuals can purchase health insurance by paying above the mandatory 7% on taxable income if desired, thus acquiring greater benefits.

The idea behind the mixed system and the creation of ISAPRES was to promote choices, within a mandated requirement for insurance. In this system, individuals can move their resources from the public to the private system as well as within the private insurance market. ISAPRES contracts are lifetime agreements; however, individuals can opt out once every year or when they change jobs. In principle, ISAPRES can only terminate contracts if the worker does not comply with payments. Nevertheless, there is evidence on ISAPRES raising the cost of insurance plans in order to discourage riskier customers from enrolling in their plans.

This mixed system provides for an interesting setting to study individual choice for health insurance as well as for exploring the existence of common economic problems of insurance such as adverse selection and moral hazard. Moral hazard can be understood as a change in an agent's risk-taking behavior after being insured. Moral hazard arises when agents do not face the complete cost (complete social cost) of their actions when insured, and insurance

companies bear a portion or all of the cost. Therefore, being insured could change behavior and create deadweight losses. In the case of health insurance, moral hazard is considered a special case of information asymmetry: agents know more about their own behavior and health service demand than insurance companies. This asymmetry creates incentive to behave inappropriately and take advantage of the insurance. In the health insurance setting, the moral hazard problem can be seen as an abuse of the system or a post-contractual opportunism. Individuals use more health services when insured than when not insured, basically because the price after insurance is lower than the marginal benefit to them. In other words, given that insurance companies bear the costs of different health services, individuals covered by insurance have the incentive to overconsume health service, (given that they do not pay the full cost of the services). In his influential paper on health economics Mark Pauly[1] develops the theoretical framework behind the moral hazard problem in health insurance. His paper displays the social losses product of overconsumption of health services due to lower prices faced by insured individuals. The article acknowledges the fact that demanding more health services is not a "moral perfidy, but a rational economic behavior."[2]

On the other hand, adverse selection is a pre-contractual information asymmetry; individuals have more information about their health status and therefore also on their expected healthcare costs and risks. Willingness to pay for insurance increases with risk and expected healthcare costs, both of which are only privately known. If insurance companies cannot discriminate price according to risk and expected costs, they will price according to their average cost, incentivizing high cost and riskier individuals to acquire insurance, and leaving out those individuals with lower risk and lower costs.

Several studies have been produced looking at the determinants of health insurance choice in Chile and elsewhere, and some of them have also addressed the issues of moral hazard and adverse selection in the system. However, most previous studies have conducted research on health insurance choice by looking at cross sectional data, leaving out the dynamics of choice. This study uses the Panel Socio Economic Characterization Survey for Chile for 1996-2001-2006 (Panel CASEN) in order to analyze what factors determine an individual's likelihood of changing from a public to a private insurance provider and vice versa, as well as to examine the existence of moral hazard and adverse selection in this mixed healthcare system. The article will be divided into six sections. The following section will discuss the relevant literature examined, the third will explain the data and provide some descriptive statistics, and the fourth will explain briefly the methodology and models. The fifth and final sections will present results and conclude, respectively.

Literature Review

1 Mark Pauly, "The Economics of Moral Hazard: Comments," *American Economic Review 58*(1968).
2 Pauly, 535.

Regarding theory-based research on health insurance choice, Aday and Anderson,[3] proposed a framework to analyze access to health care by including a broad set of variables ranging from health policy to individual characteristics, health system characteristics, service utilization, and consumer satisfaction. The paper explored the complexities of health care access and the relationships between policy design and access. They stressed the importance of studying and analyzing all variables involved in the process, in order to fully understand the dynamics and problems of health care access and delivery.

Cameron et al. proposed a microeconomic model for health insurance choice and utilization of health care services. Using data from the Australian Health Survey (1997-1978), they were able to conclude that individual health status has a greater impact on the demand for health care services than on the choice of insurance *type*, and income shows a higher relation to insurance choice than to health care service use. They also find evidence of moral hazard, because the use of health services increases when an individual is covered by insurance and increases when the insurance is more generous in terms of coverage.

Cameron and Trivedi,[4] based on the theoretical framework in their previous paper,[5] take advantage of Australian data and the changes in health insurance national policies and investigate the determinants of health insurance enrollment in two different settings in Australia. They first study the decision of getting extra coverage from 1977-1978 (using the 1977-78 Health Survey). Because basic health insurance in Australia was mandatory; they were able to look at the determinants of incremental coverage. The second period studied was March 1983 (using the March 1983 Health Insurance Survey), after mandatory insurance was abolished. The article found evidence that income is a significant determinant of incremental insurance as well as having insurance in the second period. Premium prices play an important role during the first period, mostly for the middle-income families. Health risk factors appeared to be insignificant in determining insurance choice in both periods, showing evidence *against* adverse selection. They did, however, find that sex and age were significant determinants of insurance coverage and insurance choice in both periods.

There are fewer studies that analyze the Chilean health system specifically, and those that do exist generally rely upon data from the cross section National Socio Economic Characterization Survey (CASEN) for the 1990s. Using the CASEN survey for 1990 and 1994, Sapelli and Torche explored the individual variables that determine the choice between private and public health insurance.[6] Their paper focused on individuals that are mandated by law to acquire such insurance (dependent workers and retirees). Using a logistic regression, the authors conclude that income has a positive impact on choosing private insurance over the public one, as do age, proximity to private healthcare facilities, and health status. In terms of adverse selection, the article finds evidence of adverse selection towards private insurance

3 Lu Ann Aday and Ronald Andersen, "A Framework for the Study of Access to Medical Care," *Health Service Research* (1974): 208-220.

4 Colin Cameron and Pravin Trivedi, "The Role of Income and Health Risk in Choice of Health Insurance: Evidence from Australia," *Journal of Public Economics 45*(1991): 1-28.

5 Cameron et al.

6 Claudio Sapelli and Arístides Torche, "El Seguro de Salud: Determinantes de la Elección Entre Seguro Público y Privado, 1990 -1994," *Cuadernos de Economía 106*(1998): 383-406.

on health private information and adverse selection against the public insurance on public health information; however, the adverse selection towards the private insurance disappears in the second period studies.

Sapelli and Vial, using 1996 CASEN data, examined the presence of adverse selection and moral hazard in the Chilean health insurance system by analyzing dependent and independent workers' choice of insurance and utilization of health services.[7] To analyze self-selection, they examined the relationship between health insurance choice and observable and unobservable characteristics. Looking into moral hazard or over utilization of health services, they compare the utilization of health services between both types of insurances (private and public). Using count models with selection bias corrections and negative binomial models, they were able to assess moral hazard and adverse selection for their sample. In terms of their health insurance selection model, they find that the probability of acquiring health insurance (both private and public) increases with income, number of young children in the household, household size, education, and age of the head of household. In terms of doctor visits, they increase in number with worsening health status and older age. Gender only affects doctor visits among those who have private insurance. Income did not play a significant role on doctor visits, and neither did living in a rural area. Their results show the existence of adverse selection for independent workers as well as for dependent workers against public insurance; however, the design of private insurance (allowing risk adjustments) prevents from adverse selection. Nevertheless, overutilization appears to be present in both insurance schemes. This article lacks a randomized experiment or a quasi-experimental design that could help understand the differences on health services use, which makes their results less credible.

Sanhueza and Ruiz-Tagle also studied the determinants of choosing private insurance by using the CASEN 1996 data set.[8] By estimating simultaneous equations, they calculate the probability of buying private insurance in a dual system. They find that the probability of having private health insurance increases with income as well as with the proximity of private providers. They also find a negative relationship between the age of the household head, a constructed health risk index, the percentage of females in the household, and the probability of having private insurance. Contrary to Sapelli and Vial, they show evidence that poorer health increases the probability of having private insurance, which provides evidence of adverse selection toward private insurance. Regarding moral hazard, the article finds a positive and significant correlation between the demand for health services and the probability of having private insurance, thus implying some evidence of moral hazard in the private sector.[9] The article is unable to look at changes and compare decisions across time since it relies solely upon cross section data from 1996.

By using an updated dataset and the additional time variability that a panel survey provides, this article is able to expand upon the existing literature on health insurance choice

7 Claudio Sapelli and Bernardita Vial, "Self-Selection and Moral Hazard in Chilean Health Insurance," *Journal of Health Economics 22*(2003): 459-476.

8 Ricardo Sanhueza and Jaime Ruiz-Tagle, "Choosing Health Insurance in a Dual Health Care System: The Chilean Case," *Journal of Applied Economics 5*(2002): 157-184.

9 Sapelli and Vial.

and the information asymmetry problems happening in the Chilean health insurance system. Since the survey is able to follow individuals over time, this study can model participants' choice and examine some of the characteristics that determine why people change from ISAPRES to FONASA or the other way around. The analysis of these dynamics could provide valuable information regarding adverse selection and moral hazard in the health insurance system in Chile.

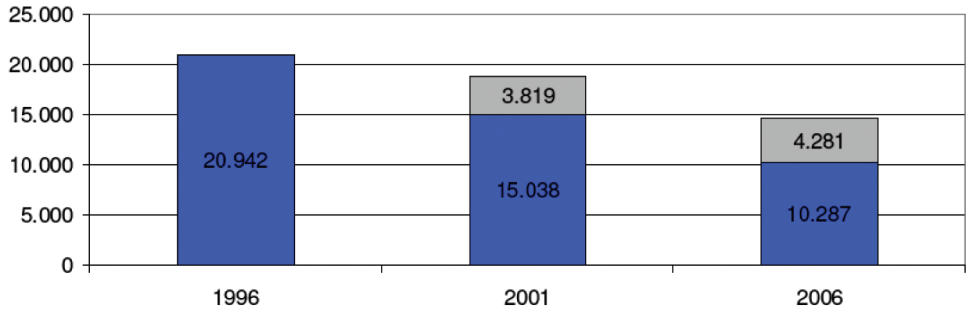
Data

Since 1985, the Chilean government has collected extensive data on household and individual socioeconomic characteristics by conducting the National Socio Economic Characterization Survey ("Encuesta de Caracterización Socioeconómica Nacional," better known as CASEN). Reliable national and regional representative surveys have been conducted in 1985, 1987, 1990, 1992, 1994, 1996, 1998, 2000, 2003, 2006 and 2009, in order to assess socioeconomic conditions and gauge social policies.

Most social science studies on Chile rely on these data sets because they are content rich and nationally representative. Nevertheless, cross sectional data such as the CASEN surveys do not permit researchers to investigate micro-level changes and certain socioeconomic dynamics such as poverty and vulnerability. This dynamism was what triggered interest in the Ministry of Planning (Mideplan) to undertake the first and only large National Socio Economic Characterization Survey Panel. The panel CASEN was not conceived as a panel on its first wave, but it turned into panel data in 2001 when Mideplan decided to re-survey a random sample of the 1996 cross section CASEN. After 5 years, 5,209 households from 4 regions (III, VII, VIII and the Metropolitan Region) were followed and re-interviewed, creating the first nationally-representative panel for Chile. Then, after 5 years, the third wave took place in 2006, creating the 10-year CASEN Panel 1996-2001-2006.

One of the traditional problems with panel data is attrition. Nevertheless, the parties responsible for the survey paid careful attention to this issue, (i.e. Ministry of Planning, Observatorio Social at Universidad Alberto Hurtado, and Fundación para la Superación de la Pobreza). Graph 1 shows the attrition in the survey.

Graph 1: Interviewed People in Each Wave



Source: Bendezú et al. 2007

Graph 1 shows how the sample lost individuals over time. The darker area represents members of the original sample, and the light gray represents new members added. Since the survey is based on households as well as individuals over a period of 10 years, new members of families already present in the survey have become part of the sample.

The total attrition for the 1996-2001 period is 28.1%, and attrition is 50.9% for the 1996-2006 period. Event though this attrition rate may seem high for a 10 year, 3 wave panel data set, it is an expected and acceptable rate. Acknowledging this issue, Mideplan paid special attention to the constriction of the weights provided in the survey in order to maintain representativeness.[10] Research for this study will make use of the 10,287 individuals surveyed in the three waves of the panel; this way, I will be able to assess changes over time, as related to my variables of interest.

Descriptive Statistics

Table 1 shows the percentages of individuals covered by each type of insurance for each wave of the survey. As seen here, there is a declining trend on private insurance holdings: in 1996, 37 percent of the people were covered by private insurance, but after 10 years, that coverage had declined to 20 percent. It appears that private insurance is losing prevalence among the Chilean people.

10 For a complete discussion on Panel CASEN attrition and quality of data, see: Luis Bendezú, et al., "La Encuesta Panel CASEN: Metodología y Calidad de los Datos Versión 1.0," *Observatorio Social Universidad Alberto Hurtado* (2007).

Table 1: Percentage of Health Insurance Users by Insurance Provider

Health Insurance	1996	2001	2006
ISAPRES	36.7	26.9	20.1
FONASA	63.3	73.1	79.9

Source: Author's elaboration from Panel CASEN 1996-2001-2006

Table 2 provides with insight on the distribution of health care insurance by age group. This table illustrates how older people and retirees (those over 65 years old) make up a large proportion of those on the public insurance, indicating that as age increases, the probability of having public health insurance increases. In 1996, only 15 percent of Chilean elderly persons were covered by ISAPRES, but by 2006, that percentage fell to 10%. This could be an adverse selection problem of the mixed system if people are moving from the private to the public sector as they get older.

Table 2: Distribution of Health Care Insurance by Age Group (in Percentages)

Health Insurance			
	1996	2001	2006
14 years old and younger			
ISAPRES	33.4	21.9	16.1
FONASA	44.1	78.1	83.9
From 15 to 30 years old			
ISAPRES	44.1	36.3	25.2
FONASA	55.9	63.7	74.8
From 31 to 45 years old			
ISAPRES	41.1	28.9	22.1
FONASA	58.9	71.1	77.8
From 46 to 55 years old			
ISAPRES	38.3	31.4	24.5
FONASA	61.2	68.6	75.5
From 56 to 65 years old			
ISAPRES	27.8	17.9	16.5
FONASA	72.2	82.1	83.5
65 and Older			
ISAPRES	14.6	8.0	10.4
FONASA	85.4	92.0	89.6

Source: Author's elaboration from Panel CASEN 1996-2001-2006

Table 3 indicates the distribution of health insurance by income quintile. Not surprisingly, poorer people are most often covered by FONASA, and wealthier people choose ISAPRES as their health insurance provider. Interestingly, this table also shows some of the dynamics of health insurance choice. Over the span of the decade covered by the survey, there has been a decline in private insurance in all quintiles, including a significant decline in the Vth quintile.

Table 3: Distribution of Health Care Insurance by Income Quintile (in Percentages)

Income Quintile	1996		2001		2006	
	ISAPRES	FONASA	ISAPRES	FONASA	ISAPRES	FONASA
I	13.1	86.9	7.4	92.6	5.5	94.5
II	17.1	82.3	10.1	89.9	5.0	95.0
III	25.1	74.9	14.3	85.7	8.7	91.3
IV	27.7	72.3	18.3	81.7	13.5	86.5
V	43.3	56.6	34.4	65.6	30.3	69.7

Source: Author's elaboration from Panel CASEN 1996-2001-2006

In order to understand why these changes occurred, the next section will explain the methodology used to estimate insurance choice and the determinants of insurance dynamics.

Methodology

In order to assess insurance choice, I will estimate a logistic regression on the dichotomous variable *health insurance*, that is, 0 if the individual chooses private insurance and 1 if the choice benefits the public insurance. These logistic regressions will be computed for each year separately. Then, taking advantage of the panel data, I will analyze transition matrixes and look for variables that determine changes between insurance providers. Making use of the panel data set, I will be able to estimate a longitudinal logistic regression model with fixed effects to better understand the determinants of choice. This will also enable me to look for evidence of adverse selection and moral hazard by including variables on health status, negative health shocks, and health monthly expenditures. Following the literature on poverty dynamics and vulnerability,[11] by looking at the transition matrixes, I will be able to determine who changes insurance providers and then estimate the variables that influence the changing decision.

The variables included in the econometric models are: the log of per capita income, age, gender, and two-parent household; ratio of employed individuals to total number of people living in the household; number of employed individuals in the household; employment status of the head of household; a dummy to control for urban and rural areas; health shock ex-

11 See: José Ramón Zubizarreta, "Dinámica de la Pobreza: El Caso de Chile 1996-2001," *Memoria para optar al título de Ingeniero Civil de Industrias, con Diploma en Ingeniería Matemática Pontificia Universidad Católica de Chile* (2005); Christopher Neilson et al., "The Dynamics of Poverty in Chile." *Journal of Latin-American Studies 40*(2008): 251–273.; and Rodrigo Castro, and María Elena Arzola, "Determinantes de la Movilidad de la Pobreza en Chile (1996-2006)," *Instituto Libertad y Desarrollo, Serie Informe Social 112*(2008).

perience; and monthly health expenditures. The inclusion of variables on health shocks and health expenditures provides evidence on the existence of adverse selection as well as moral hazard. If adverse selection were occurring, experiencing a health shock would improve the probability of changing from private to public insurance. Also, if monthly expenditures increase I would expect the probability of change from private to public insurance to increase as well, in order support the moral hazard hypothesis.

Results

Table 4 shows the transition matrices: here we can see the percentages of change from FONASA to ISAPRES (and vice versa) as well as the percentage of people staying with their previous insurance provider. The matrixes show changes from 1996 to 2001, and 2001 to 2006. 44 percent of those insured by ISAPRES in 1996 changed to FONASA in 2001, and only 10 percent made the opposite switch. For the period of 2001-2006, the results are similar: 46 percent of ISAPRES insurance holders changed to FONASA, and only 8 percent changed from FONASA to ISAPRES. Table 5 provides an overall view of individual change. From 1996 to 2001, almost 80 percent of the people did not change insurance providers (stayers), 14 percent changed from private insurance to public, and 6 percent switched from public to private insurance. For the period of 2001-2006, the numbers are similar, with 84 percent of respondents as stayers, 6 percent as public-to-private changers, and 10 percent as private-to-public transfers.

Table 4: Transition Matrices for 1996-2001 and 2001-2006

Transition Matrix I (1996-2001)			
		2001	
		ISAPRES	**FONASA**
1996	**ISAPRES**	55.9	44.1
	FONASA	10.1	89.6

Transition Matrix II (2001-2006)			
		2006	
		ISAPRES	**FONASA**
2001	**ISAPRES**	54.4	45.6
	FONASA	7.8	92.2

Source: Author's elaboration from Panel CASEN 1996-2001-2006

Table 5: Insurance Dynamics, by Percentage of People in Each State

Insurance Dynamics		
	1996-2001	2001-2006
Stayer	79.9	84.4
Pub-Priv change	5.8	5.8
Priv-Pub change	14.3	9.8

Source: Author's elaboration from Panel CASEN 1996-2001-2006

Regarding the insurance choice model, Tables 6 and 7 provide the logistic regression results. Following the literature on health insurance choice, I estimated the probability of choosing public insurance, first separately for each year. Then, using the longitudinal logit regression, I was able to estimate the decision to change from public to private and from private to public insurance, combining all available years and relevant variables. The results of the first logit estimations for each year are presented in Table 6, and the longitudinal results are presented in Table 7.

Table 6: Logit Regression on Health Insurance Choice for Each Year of the Study

VARIABLES	Health Insurance Choice 1996 (1 Fonasa, 0 Isapre)	Health Insurance Choice 2001 (1 Fonasa, 0 Isapre)	Health Insurance Choice 2006 (1 Fonasa, 0 Isapre)
Log per capita income	-0.72***	-0.80***	-0.97***
	(0.05)	(0.05)	(0.07)
Age	0.02***	0.01***	0.01***
	(0.002)	(0.002)	(0.002)
Years of education	-0.06***	-0.09***	-0.11***
	(0.01)	(0.01)	(0.01)
Gender (male=1)	0.18***	0.37***	0.30***
	(0.05)	(0.06)	(0.07)
Two-parent household	0.17**	-0.03	0.05
	(0.08)	(0.08)	(0.09)
# Employed to household size ratio	-0.19 (0.19)	-0.29 (0.20)	0.42** (0.21)
# Employed in the household	-0.06 (0.05)	-0.02 (0.06)	-0.06 (0.05)
Education of the household head (years)	-0.08*** (0.01)	-0.09*** (0.01)	-0.07*** (0.01)
Household head unemployed (1 yes, 0 no)	0.16* (0.09)	-0.15 (0.09)	0.02 (0.106)
Urban-Rural (urban=1, rural=0)	-0.35*** (0.09)	-0.32*** (0.10)	-0.07 (0.12)
Experienced a health shock within the past 5 years (2001)		0.25** (0.11)	-0.03 (0.13)
Experienced a health shock within the past 5 years (2006)			0.46*** (0.11)
Constant	9.53***	11.51***	13.77***
	(0.46)	(0.53)	(0.76)
Observations	8,720	9,131	8,011

*Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table 7: Longitudinal Logistic Regression

VARIABLES	Change from Public to Private Insurance	Change from Private to Public Insurance
Log per capita Income	0.22***	0.02
	(0.08)	(0.0518)
Gender (male=1)	0.35***	0.30***
	(0.11)	(0.07)
Urban-Rural (urban=1, rural=0)	-0.23	0.43***
	(0.14)	(0.107)
Household size	0.11***	0.03
	(0.04)	(0.0289)
Years of education	0.08***	0.04***
	(0.01)	(0.01)
Age	-0.02***	-0.006**
	(0.004)	(0.003)
Experienced a health shock	-0.48***	0.21**
	(0.18)	(0.1)
Monthly health expenditure	0.06	0.16*
	(0.13)	(0.08)
Constant	-5.50***	-3.09***
	(0.76)	(0.51)
Observations	7,884	7,965
Number of idpersona	5,581	5,615

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

The results of the choice logit regressions provide evidence of adverse selection towards the public insurance: people who experienced a health shock in the previous five years have a higher probability of choosing FONASA over ISAPRES, in 2001 the coefficient estimated was 0.25, and for 2006 0.46, both statistically significant at 95 percent and 99 percent confidence levels, respectively. Regarding the other variables included in the regression, results were similar to those found by other authors, previously. Income plays an important role in determining insurance choice, since the larger the income, the lower the probability of choosing FONASA over the private insurance. This was evident in my model, since in all three regressions the sign was negative and the coefficient estimated was statistically significant. The older the person, the higher the probability of choosing public insurance. This evidence aligned with Table 2. Higher education levels also lower the probability of choosing FONASA, and males are more likely to choose FONASA over women. The variable of living in a two-parent household does not appear to be statistically significant in determining insurance choice, except in 1996, where it had a positive sign. Employment of the household head did

not predict choice in this model, and the ratio of employed people to household size was only significant and positive for 2006. However, the education of the household head did influence choice – the household heads with higher education levels had a lower probability of choosing public insurance for all three years. People living in urban areas were less likely to get public insurance for 1996 and 2001, but the coefficient estimated for 2006 was not statistically significant.

The results of the longitudinal logit model show the dynamics of health insurance change over the period of 1996, 2001, and 2006. As expected, income appears to be a significant determinant of the probability of changing from public to private insurance – the higher the income, the higher the probability of changing from FONASA to ISAPRES. Males have a higher probability of changing both from private to public and from public to private insurance. People living in urban areas are more likely to change from private to public insurance, but not the other way around. The coefficient for household size is positive and significant only for the probability of changing from the public to the private insurance scheme. Education also influences positively both changes, but the effect on the probability of changing from FONASA to ISAPRES is higher – 0.08 versus 0.04. Experiencing a health shock is associated with a higher probability of changing from private to public insurance, and it lowers the probability of changing the opposite direction. This result could be evidence of problems of moral hazard and adverse selection following a health shock, which would lead to the expectation of higher demand for health care, causing people to move from the private to the public sector. The other evidence supporting adverse selection and moral hazard toward FONASA is the variable of monthly health expenditure, which impacts positively the probability of changing from private to public sector but does not show a significant effect on the probability of changing from ISAPRES to FONASA.

Conclusions

Using panel data from Chile's National Socio Economic Characterization Survey 1996-2001-2006, this study examines health insurance choice and its dynamics over a ten year time period. Between 1996 and 2006, many people did change their insurance providers. Private insurance appears to be losing customers to the public sector.

The results of the logistic regressions for yearly choices display evidence on the determinants of insurance selection. Income seems to be highly important in determining the choice – higher income lowers the probability of choosing public health insurance. Also important in the choice model are age, education, gender, location (rural versus urban living situations), and the presence of health shocks. After analyzing the determinants of insurance change (the dynamic approach), I conclude that income, gender, education, age, health shocks, and monthly health expenditures have a significant impact on the decision of changing from private to public insurance providers. Evidence of moral hazard and adverse selection was found in the longitudinal and cross section analysis. The results of this research are aligned with most of the previous investigations done on Chile's health insurance system and advance the knowledge by including models that explain why people change insurance providers by making use of the dynamism that panel data permits.

References

Aday, Lu Ann, and Ronald Andersen. "A Framework for the Study of Access to Medical Care." *Health Service Research* (1974): 208-220.

Annick, Manuel. "The Chilean Health System: 20 Years of Reform." *Salud Pública de México 22*(2002): 60-68.

Bendezú, Luis, Angela Denis, Carmen Luz Sánchez, Pamela Ugalde, and José Ramón Zubizarreta. "La Encuesta Panel CASEN: Metodología y Calidad de los Datos Versión 1.0." *Observatorio Social Universidad Alberto Hurtado* (2007).

Cameron, Colin, Pravin Trivedi, Frank Milne, and John Piggott. "A Microeconomic Model of Demand for Health Care and Health Care Insurance in Australia." *Review of Economic Studies 55*(1988): 85-106.

Cameron, Colin, and Pravin Trivedi. "The Role of Income and Health Risk in Choice of Health Insurance: Evidence from Australia." *Journal of Public Economics 45*(1991): 1-28.

Castro, Rodrigo, and María Elena Arzola. "Determinantes de la Movilidad de la Pobreza en Chile (1996-2006)." *Instituto Libertad y Desarrollo, Serie Informe Social 112*(2008).

García, Luís. "Seguros de Salud Públicos y Privados: El Caso Chileno." *Pontificia Universidad Católica de Chile Documentos de trabajo 172* (1999).

Guiñez, Paulina, and Bozidar Calderón. "Determinantes de la Elección Entre Sistemas de Salud en Chile: Años 1996 y 2000." *Universidad de Concepción, Facultad de Ciencias Económicas y Administrativas, Departamento de Economía* (2002).

Neilson, Christopher, Dante Contreras, Ryan Cooper, and Jorge Hermann. "The Dynamics of Poverty in Chile." *Journal of Latin-American Studies 40*(2008): 251–273.

Observatorio Social, Unversidad Alberto Hurtado. *La Encuesta Panel CASEN: Manual de Usuario.* Santiago, Chile: Unversidad Alberto Hurtado, 2007.

Pauly, Mark. "The Economics of Moral Hazard: Comments." *American Economic Review 58*(1968): 531-537.

Sanhueza, Ricardo, and Jaime Ruiz-Tagle. "Choosing Health Insurance in a Dual Health Care System: The Chilean Case." *Journal of Applied Economics 5*(2002): 157-184.

Sapelli, Claudio, and Bernardita Vial. "Self-Selection and Moral Hazard in Chilean Health Insurance." *Journal of Health Economics 22*(2003): 459-476.

Sapelli, Claudio, and Arístides Torche. "El Seguro de Salud: Determinantes de la Elección Entre Seguro Público y Privado, 1990 -1994." *Cuadernos de Economía 106*(1998): 383-406.

Vergara, Marcos. "Equidad en el Acceso a la Salud en Chile." *Revista Chilena de Salud Pública 11*(2007): 150-157.

Zubizarreta, José Ramón. "Dinámica de la Pobreza: El Caso de Chile 1996-2001." *Memoria para optar al título de Ingeniero Civil de Industrias, con Diploma en Ingeniería Matemática Pontificia Universidad Católica de Chile* (2005).

China, Multinational Corporations, and Internet Privacy Issues: An Incoherent Landscape

Lysette Kent

Abstract

In the mid 2000s, staff at the Chinese division of Yahoo! sent information on one of its users, Shi Tao, to the Chinese government. The journalist had been critical of the Chinese government, and, based on the information sent to the government, Shi Tao was sentenced to ten years in prison. In 2010, e-mail accounts housed by Google were hacked. Many of these accounts belonged to human rights activists. Issues like these pose a conundrum for the United States and international entities that are looking to prevent human rights abuses, including violations of privacy, in countries such as China. This paper will evaluate current and proposed efforts to curb such actions by the Chinese government. I propose the following three-pronged approach to deal with these actions: 1) a vigorous naming, blaming, and shaming campaign; 2) the adoption of a uniform policy by the United States government for addressing the Chinese government on these issues; and 3) the development of coherent, enforceable, and specific codes of conduct by trade associations and business groups that discuss issues of censorship and privacy regarding the internet, their customers, and foreign governments.

Statement of the Problem

In the mid-2000s, staff at the Chinese branch of Yahoo! sent private information on one of its users, Shi Tao, to the Chinese government. Shi Tao was a journalist who had been critical of the Chinese government in e-mails on his Yahoo! account. Based on agreements that Yahoo! had entered into with the Chinese government in an effort to get access to a large, rapidly expanding market share in China, Yahoo! was not placed in control of such decisions. This is because they were required to enter into a partnership with China-based company Alibaba, in which the Chinese state still maintains a 40 percent stake.[1] Because of this, Shi Tao was arrested, tried, and sentenced to 10 years in prison for "e-mailing 'state secrets.'"[2] After this, Yahoo! was investigated by Congress for its role. Yahoo! provided the defense that they did not know the scope of the information being asked for by the Chinese government. They stated that the request was handled entirely by the Yahoo! China offices in Beijing.[3] This shows one type of privacy violation, in which a company provides information to the Chinese government, regarding the use of the internet by one of or a group of their customers. Other cases show different issues that arise involving privacy, the internet, and China. Considering these issues, this paper will attempt to address what the proper role of multinational corporations should be regarding foreign countries that impose unfair restrictions on the internet or use the internet to violate the privacy of their citizens. This paper will use China as a case study and will discuss, in detail, the Yahoo! case and the case of Google in 2010. With Yahoo! implicated in the Shi Tao case (amongst others) and other companies, such as Google, Cisco, and Microsoft implicated in corporate complicity regarding the censorship of the internet in China, this question is extraordinarily relevant in today's world. China has nearly 400 million people online, a number that has shown rapid growth in recent years and has the potential to more than double its number of internet users in the near future, making this question even more pressing.

Standing in contrast to the Yahoo! case is the case of Google. In 2010, Google left the Chinese market after experiencing a string of cyber attacks. According to Google's blog, they discovered that the attacks were meant to infiltrate the e-mail accounts of Chinese human rights activists.[4] Google attempted to reroute its services through its Google Hong Kong browser.[5] However, the Chinese government eventually stopped this service. Currently, the Google China website displays a page that will only lead to Google Hong Kong, a site that will not currently run searches.[6] Some have argued that Google's response sounded like "sour grapes from a company with a low market share, weak revenues, and unfair competition during its four years inside the Great Fire Wall."[7] Regardless of the differences between the Yahoo! case and the Google case, the Google case links these issues, showing how the Chinese censorship

1 Jeffrey G. MacDonald, "When Yahoo! in China is Not Yahoo!," *Christian Science Monitor* 98(55): 1-2.
2 Robert Marqueland, "Yahoo!, Chinese Police, and a Jailed Journalist," *Christian Science Monitor 97*(201): 7.
3 "Yahoo!'s Defense in Case of Jailed Dissident," *Business Week Online*, November 7, 2007, 18.
4 "A New Approach to China: The Official Google Blog, January 12, 2010," accessed May 31, 2010, http://googleblog.blogspot.com/2010/01/new-approach-to-china.html.
5 "A New Approach to China: The Official Google Blog, March 22, 2010," accessed May 31, 2010, http://googleblog.blogspot.com/2010/03/new-approach-to-china-update.html.
6 "Google China," accessed November 10, 2010, http://www.google.cn.
7 Jonathan Watts, "How Internet Giant Google Turned on Gatekeepers of China's Great Firewall," *The Guardian*, January 14, 2010.

regime can box a company in regarding issues of privacy.

In short, these two cases show that there are two types of privacy violations when it comes to the internet in China. There are those privacy violations that occur because a company turned information over to the government and those privacy violations that occur when hackers try to attack a company and get information. This paper will try to determine the proper role of multinational corporations, trade associations and business groups, international NGOs, and the international political community in addressing these issues. I will examine these two cases to more fully understand this difference between the types of violations and then will pose the policy implications for the international community throughout the paper. Thus, this paper will posit that such violations need to be met with a multifaceted approach that includes actions from governmental and nongovernmental organizations, as opposed to the current, purely legal, approach.

The first problem discussed will be situations in which a company provides information to a government. The problem in these situations is one of corporate complicity with authoritarian regimes as it relates to the internet. Violations of privacy by companies such as Yahoo! can have a deleterious effect on privacy rights, and proposed measures to stop these actions from occurring have been ineffective. The second problem concerns companies being raided by hackers to take information. In discussing this point, this paper will touch on the GhostNet hack and the Google situation in China in late 2009 and early 2010. Thus, there is another side of privacy violations, those without corporate complicity, and these could be considered equally dangerous. There are these two types of privacy violations, but the second type of violation could be of two characters: 1) the government did not have the appropriate leverage to get the information it wanted, or 2) there was a large amount of independent and non-governmental hackers within China that are bent on protecting the country's nationalism.

Some may argue that this difference makes the case of Google irrelevant in this paper, given that they were attacked to gain information, rather than comply with a request from the Chinese government. However, Google did have a past history of complying with Chinese government requests, providing a censored version of their search engine.[8] Thus, even though Google is not readily giving up information to the Chinese government, their history of corporate complicity (censoring their search engine in China) still makes this case relevant. It may just show the differences that arise between a company that has a well-established and governmentally backed presence in China (Yahoo! with Alibaba), versus the actions of an independent company (Google). This is especially important because it is not known if the Chinese government initially asked for information from Google before this string of cyber attacks or if the company was simply attacked. Thus, even with its differences, the case is important within the context of this paper.

8 Human Rights Watch, "Race to the Bottom: Corporate Complicity in Chinese Internet Censorship," *Human Rights Watch 18*(8): 5.

Methodology

In discussing privacy issues in China, two recent cases exemplify the complex issues that surround the internet. These two cases involve two major multinational corporations, Yahoo! and Google. In approaching this subject, this paper will first discuss each case, the specific facts of each, and the major differences between them. Doing this will give a brief history of privacy issues, the internet, and multinational corporations in China, based on the limited history of the internet in China. The case involving Yahoo! occurred in 2006 and the case concerning Google occurred in 2010. While other multinational corporations, including Microsoft and Cisco have been implicated in actions related to governmental censorship and use of electronic information in China, this paper will largely focus on these two cases. This is for two main reasons: 1) there is more concrete information present regarding the actions of Yahoo! and Google, and 2) for brevity's sake.

Case 1: Yahoo!, Alibaba, and Shi Tao

In 2007, two Chinese journalists sued Yahoo! for abetting torture. They said that because Yahoo! provided information to the Chinese government, the company aided the Chinese in the subsequent arrests and torture of Wang Xiaoxing and others.[9] This must be coupled with the arrest of Shi Tao.[10] In that case, Yahoo! Holdings, Ltd. (based in Hong Kong) provided the information to the Chinese government, stating, "Yahoo! must ensure that its local country sites must operate within the [local] laws, regulations, and customs."[11] The practices of Yahoo! go as far back as 2003, when Yahoo! was accused of helping the Chinese government get information on Li Zhi, an anticorruption reformer.[12] These issues stem from Yahoo!'s involvement with Alibaba.com, which is a Chinese company that is 40 percent owned by the Chinese government.[13] Yahoo! officials said in the aftermath of these issues that their company's close ties with Alibaba were an "important point to make."[14] The connection with Alibaba also suggests a distinct problem for those who believe that the United States should pass legislation to stop such actions from occurring. According to Jeffrey MacDonald, writing for the *Christian Science Monitor*, "For its part, Alibaba.com suggests Beijing policy would trump laws that Congress might pass."[15] Officials continue to talk about the importance of local laws and customs as the reasons why Yahoo! in China has given up so much information. However, it is also worth noting that Yahoo! is only a minority stakeholder which would make legislating their actions in China difficult.[16]

Case 2: The Google Case

Much more recently, Google and China became engaged in a disagreement over a series of cyber attacks that occurred against the Google computer network. Google claimed that

9 William A. Cohn, "Yahoo!'s China Defense," *The New Presence, 10*(2): 30.
10 Marqueland, "Yahoo!, Chinese Police, and a Jailed Journalist," 7.
11 Ibid.
12 MacDonald, "When Yahoo! in China is Not Yahoo!," 1-2.
13 Ibid.
14 Ibid.
15 Ibid.
16 Ibid.

these attacks, leveled at their organization and many others, served to attempt to infiltrate the e-mail accounts of numerous human rights activists in China. In early 2010, Google announced that it would reroute all its search engine capabilities on the general Google.cn site (China's version of Google.com) to Google.com.hk, based out of Hong Kong. This would allow for people who were behind the "Great Firewall of China" to be able to search freely on Google. Later in 2010, Google.cn was replaced with a page that only bore a link to Google.com.hk and was unable to be used to search. Surprisingly, considering the typical hard line stance taken by China regarding companies that rebuff their attempts to control the internet, Google had its Internet Cache Protocol (ICP) license renewed in China in July 2010.[17] These licenses are required in China to provide internet content. If Google's license had been revoked, they would have lost access to a potentially enormous market. This renewal may be important because of the impact of hackers in the Google case. When it is considered that the ICP license was never in question because of a refusal to comply on behalf of Google (other than a refusal to continue its Chinese site), it is less shocking the license was renewed. Once it was renewed, the method Google was using to conduct searches was the same as before: a landing page at www.google.cn, which led to a link for www.google.com.hk. This shows a distinction between cases such as Yahoo's (in which the company must comply with a government request) and Google's (in which a company is given some leeway in protecting its information from third parties). However, it is still an open question as to how stable the Google system in China is currently, since it would certainly be possible for China to block www.google.com.hk in the future. Also, search services on Google Hong Kong could encounter any of the many problems of searching on Google's main search engine, including a slow and unstable search procedure that limits the ability of the program. Many pointed out that Google was not a major player in the Chinese internet market; however, Google does serve as a major company in the international internet market, with a well recognized search engine, e-mail client, and numerous other applications.

Differences between the Cases

Since the 2005 merger of Alibaba and Yahoo!, there was little control of Yahoo!'s operations in China, and Yahoo! would have encountered numerous difficulties in trying to leave the country. In contrast, Google had a smaller market share and no major Chinese partner, which may have made it easier for that company to buck the Chinese government. However, they still attempted to first reroute their services before coming to a point where there services were largely removed from China. Thus, there are two major differences between these two cases. On the one hand, we have a company (Yahoo!) that is controlled by an agreement that was signed between the company and Alibaba. On the other, we see the reaction of a more independent company (Google). Since Alibaba is so tied to the Chinese government, Yahoo! would logically tilt toward acquiescing to requests from the Chinese government. This is compounded by the presence of a concrete governmental request. Google, which is not tied to the Chinese government, would not have such corporate impulses, especially considering the nature of the case (which involved third party attacks, not governmental requests).

17 "An Update on China: The Official Google Blog, July 6, 2010," accessed November 10, 2010, http://googleblog.blogspot.com/2010/06/update-on-china.html.

Hacking to gain information is not an uncommon practice in China. In recent history, programs like GhostNet have been implicated in the disappearances or arrests of Chinese human rights activists. Stories can be as extreme as programs that turn on webcams to be able to snap a picture of the alleged human rights activist sitting at his or her computer. While this is devious enough, it is compounded by the fact that these webcams are turned on, but the light on the computer that lets the user know the camera is on is commanded to remain unlit.[18] Thus, such hacking blends espionage and information gathering. GhostNet was responsible for the arrests of several Tibetan dissidents who were arrested as they re-entered China. GhostNet reached servers for the Netherlands-based and US-based International Campaign for Tibet (ICT), as well as numerous other organizations.[19]

It is a possibility that, because Google had such a low standing in the Chinese economy and was not partially owned by a Chinese giant like Alibaba, Google was selected to be attacked by a wave of hacking to gain information. In the cases of Yahoo! in recent memory, information was disclosed very easily from the company to the government, upon request. In the case of Google, there was an offensive strike that sought to take the requisite information. This could be due to the fact that Google initially refused the requests or lacked the physical presence in China for requests to be made. It is also possible that there are simply numerous nationalistic hackers in China, attempting to gain information regarding human rights activists. Such hackers in other countries (especially Russia) even have a name – "patriotic hackers" – and have engaged in extreme behaviors in an effort to ruin Estonia.[20] However, because of attribution problems arising from the diffuse nature of the internet, it is hard to tell if the Chinese hackers are members of the Chinese government or if they are merely citizens with computers and an ax to grind with the Western world.

Regardless of Google, Yahoo!, or Alibaba's clout within the Chinese market, economic concerns must be addressed when looking at this issue. The Chinese market is large, now boasting nearly 400 million users of the internet.[21] This is what Surya Deva calls the "China Factor," the lure of the large Chinese market, regardless of whether a company can break into that market or can act in an ethical manner once it has done so.[22] Deva notes that Yahoo!, which was an early player in the internet in China, arriving into the market in 1999, became immediately complicit in the country's internet censorship regime before moving on to providing private information regarding users.[23] Yahoo! has been called the worst offender regarding corporate complicity with internet censorship in China.[24] Many of these problems, particularly regarding the provision of private information by Yahoo! to the government, may stem from 2005, when Yahoo! merged with Alibaba. Deva argues that this allowed for Yahoo! to blame its subsidiary company for the actions it took in China. Yahoo!'s defense following

18 Information Warfare Monitor, "Tracking GhostNet: Investigating a Cyber Espionage Network," *Information Warfare Monitor,* March 29, 2009.
19 Ibid.
20 James A. Lewis, "Cyber Attacks Explained," *CSIS Commentary,* June 15, 2007.
21 Chris Buckley, "China Internet Population Hits 384 Million," *Reuters*, January 15, 2010.
22 Surya Deva, "Corporate Complicity in Internet Censorship in China: Who Cares for the Global Compact or the Global Online Freedom Act?" *George Washington International Law Review 39*(2007): 261.
23 Ibid., 267.
24 Ibid.

incidents such as Shi Tao has been to argue that Yahoo! does not have day to day control over their actions in China.[25] Another defense offered by Yahoo! executives regarding their actions in China was that, because such actions have been legally mandated by the Chinese government, Yahoo! was forced to comply or its staff in China could have been arrested. In short, as per Michael Callahan, the Senior Vice President of Yahoo!, "Ultimately, American companies face a choice: comply with Chinese laws or leave."[26] Here is where we see the pull of the large Chinese market, for, as Deva says, it would be highly unlikely that companies would choose to accept such blatant behavior in other countries like Myanmar or Zimbabwe.[27]

The Effects of the Current International Legal System

The bulk of international law on this subject comes from two sources: The Global Online Freedom Act and the Global Compact. The Global Online Freedom Act and the Global Compact have unfortunately come up short in stopping corporate complicity with regards to authoritarian states and the internet.[28] This is because companies have routinely flouted the regulations promoted by the UN's Global Compact and, in cases where they made agreements, were woefully lacking in implementation. Surya Deva argues that, while two of the principles of the Global Compact are directly related to the notions of internet freedom in China and the provision of private data to the Chinese government, Google and Yahoo! have not actually accepted the Global Compact as a defining part of their role in China.[29] However, it is also noted that the Global Compact serves as an offshoot of human rights norms posited by the United Nations, along with a string of UN rights documents, which make general demands of companies regarding their human rights record.[30] Deva further notes, though, that these mechanisms do not talk in detail about the actions those companies should take in situations where they are found by shareholders to be complicit in human rights abuses. Further, there is also the problem of subsidiary companies and parent companies, as is seen here, with the case involving Yahoo! and its Chinese subsidiary. This is especially pronounced in Yahoo!'s case, considering their lack of control over day to day operations, given that they gave said control to Alibaba.[31] Thus, it can be seen that enforcement of the Global Compact and, by extension, international human rights norms on corporations is quite difficult given the confusing landscape presented.

Perhaps the biggest problem with the Global Compact is that it is not a regulatory instrument. As per Deva, the regulations are, at best, "one liners" that provide little in the way of nuanced or detailed regulations.[32] Deva argues that this was largely to keep the deal attractive for corporations, who saw the compact as a way to dissuade anti-globalization forces around the world by giving the UN what it wanted regarding the Global Compact.[33] In short, the

25 Ibid., 267-68.
26 Ibid, 268.
27 Ibid., 261.
28 Ibid., 257.
29 Ibid., 279.
30 Ibid., 279-80.
31 Ibid., 281-83.
32 Surya Deva, "Global Compact: A Critique of the UN's "Public-Private" Partnership for Promoting Corporate Citizenship," *Syracuse Journal of International Law and Commerce, 34*(2006-2007): 129.
33 Ibid., 110, 129

Global Compact provides the norms and standards to companies who accept them. However, it provides no methods for enforcement when a company breaks those regulations.[34] As an instrument, it does not even measure good and bad behavior. The Compact simply leaves the enforcement and enlightenment of corporations to the corporations themselves.[35] In short, the Global Compact is simply too vague and too reliant on self-enforcement to be effective, given the market pull of a country like China.

In regards to the Global Online Freedom Act, a piece of legislation posed in the United States, the complexities of international law on this issue make enforcement difficult, even though the law shows promise in theoretically stopping such abuses.[36] Deva finds little evidence that the Global Online Freedom Act would even be enacted and sees extreme problems regarding its enforcement.[37] The Act was put forth by Representative Christopher Smith in 2006 and has subsequently been referred to a series of committees and subcommittees within the United States. It is important to recognize that lawmakers are specifically targeting China's actions with this piece of legislation. According to William J. Cannici Jr., "While GOFA acknowledges nine Internet-restricting countries," China is the major offender and the primary target of the Act."[38] The Act itself has yet to pass, though it has already been in the works for several years.[39] Deva argues that the Online Freedom Act could serve as an important component in the *enforcement* of laws relating to internet freedom in countries like China.[40] This is because, as opposed to the Global Compact, the Global Online Freedom Act is much more specific in its language. The act says that, if a US company engages in any one of a number of acts, including providing private information on users to a government of an "internet controlling" state, the company can be punished. Such punishments would include those of both civil and criminal nature.[41] It is important to note that there are still issues with this proposed piece of legislation. According to Nellie Viner:

Section 201 of the Act would prohibit Internet companies from storing personally identifiable information in Internet-restricting countries. This means that the Act would prohibit companies "from locating any hardware associated with their services within a country designated" as Internet-restricting. As a result of this location restriction, the number of countries in which a server could be located would be greatly decreased. Consequently, an Internet search would unearth a much smaller number of results than if the server were located within the country in which the search was initiated. This is because servers located abroad are slower and limited by state-level firewalls and filtering.[42]

34 Deva, "Corporate Complicity in Internet Censorship in China," 293.
35 Ibid.
36 Ibid., 257-58.
37 Ibid., 258.
38 William J. Cannici, Jr., "The Global Online Freedom Act: A Critique of its Objectives, Methods, and Ultimate Effectiveness Combating American Businesses that Facilitate Internet Censorship in the People's Republic of China," *Seton Hall Legislative Journal 32*(2007-2008): 125.
39 Deva, "Corporate Complicity in Internet Censorship in China" 309.
40 Deva, "Corporate Complicity in Internet Censorship in China" 311.
41 Ibid., 312-314.
42 Nellie L. Viner, "The Global Online Freedom Act: Can U.S. Internet Companies Scale the Great Chinese Firewall at the Gates of the Chinese Century?" *The Iowa Law Review 93*(2007-2008): 383

Viner argues that the law should merely be amended and passed and that it would effectively aid all parties in the discussion of Chinese internet censorship. However, Viner herself notes that the important aspect of Section 201 is the ability of this provision to limit state use of the internet to violate privacy.[43] As such, we can see that the Global Online Freedom Act is at odds with itself. In trying to stop both censorship and privacy violations involving the internet, it has text that puts these two objectives in stark contrast. Viner also notes that, if Section 201 remains, foreign companies, many of whom will care less about human rights (and, in all likelihood, privacy of their users) than the United States does, would be able to take greater control of the internet.[44] As such, Section 201 itself might have little effect on the issue of privacy, further compounding questions regarding the legitimacy of legislation in this instance. Cannici notes, however, that newer iterations of this legislation have included a "presidential waiver," where the president can allow any company based in the United States to operate within an internet restricting country.[45] Thus, even one is willing to accept the trade-off posed by the Global Online Freedom Act, newer forms of the law open a potential loophole that could make its privacy violation powers moot. Perhaps the greatest obstacle to the Global Online Freedom Act is a lack of political will, considering that this law has yet to pass. It seems highly unlikely that it will be passed in its current form, given the issues with Section 201 and the reforms and amendments consistently proposed. The failure to actually put a stable law on the table indicates a significant problem of the current legal regime in addressing such problems.

Our Legal Disconnect: Telecommunications Immunity and Internet Censorship

Further, regarding the current legal framework, there is a disconnect regarding the effect and role of domestic telecommunications laws in the United States, which gave telecommunications companies immunity in regards to their actions supporting the War on Terror through domestic wiretapping or spying. The law, the Foreign Intelligence Surveillance Act Amendments Act of 2008 (Section 201), as signed into law July 10, 2008:

> Prohibits any federal or civil action against any person (including an electronic communication service provider or a landlord or custodian) providing surveillance assistance to an IC element if the AG certifies that such assistance was: (1) provided pursuant to an order or directive under FISA; (2) in connection with an intelligence activity authorized by the President during the period beginning on September 11, 2001, and ending on January 17, 2007, and designed to detect or prevent a terrorist attack against the United States; (3) the subject of a written request from the AG or IC element head to the provider indicating that the activity was authorized by the President and determined to be lawful; or (4) not provided. Allows for the judicial review of such certifications. Limits certification disclosure for national security purposes. Prohibits state law preemption of the protections afforded assistance providers under this section. Requires semiannual reports from the AG to the intelligence and judiciary committees on the implementation of this title. Title III: Review of Previous Actions.[46]

43 Ibid., 384.
44 Viner, "The Global Online Freedom Act" 385.
45 Cannici, Jr., "The Global Online Freedom Act," 139.
46 FISA Amendments Act of 2008, *US Code*, Title 110, Section 201.

This makes developing laws that punish companies engaging in such actions in foreign countries seem hypocritical, undermining their legitimacy. In an interview with Dr. Erick Novotny conducted on October 1, 2010, it was mentioned that the presence of such laws could serve as a lightning rod for those who would claim that the United States is being "imperialistic" or "hypocritical" as a country by demanding China stop its efforts to gain confidential information.[47] He mentioned that Justice Department officials, when they attempted to investigate the actions of the Pentagon regarding domestic wiretapping, had their security clearances revoked. The overall message, according to Novotny, was that security trumped criminal activity.[48]

Novotny also discussed the company Narus, which is a California company with offices in Shanghai. Narus is staffed by former NSA officers, and one of its main jobs is to make tracking software that can specifically locate dissidents. Its goal in these situations is to create complete network and data visibility.[49] These domestic issues are a huge blow to the ability of the U.S. government to conduct diplomatic actions with the Chinese on this issue. This is specifically true given the fact that former NSA staffers are operating a company that is doing exactly what the United States would be lobbying against. The presence of Narus is more than corporate complicity; it is indeed corporate action to suppress human rights. Thus, while it might on face seem like a good time for the Obama Administration to be making a lot of noise regarding human rights with China, these issues have largely been traded for bigger, macroeconomic concerns.[50] There is a definite possibility that this has occurred because the United States feels it has "lost the high ground" on this issue, given the presence of both the telecommunications immunity presented in the FISA Amendments Act and the presence of companies like Narus. Combining this with China's improved economic stature, there is a definite possibility of a situation in which the United States does not have the leverage to be able to limit China on this issue.[51]

Alternative Solutions

There are severe drawbacks to the proposed solutions to these problems. In place of these solutions and the current policy, this paper will recommend a mixed approach as a possible alternative. In the end, it will be conceded that, within a shifting and confusing domestic and international political spectrum, a coherent strategy will be hard to come by. Thus, there must be action on the part of both governmental and non-governmental actors in fixing such problems. The current legal regime that has been put forward is ineffective. Future solutions have been complicated by other actions taken by the United States government, specifically United States laws that grant immunity to telecommunications companies. There is a need for stringent lobbying of the United States government, the Chinese government, and the companies themselves, on behalf of both trade unions and non-governmental human rights organizations. Efforts in the United States should be to form a coherent and easy to navigate legal regime on the issue of internet privacy. Lobbying efforts against the Chinese and the

47 Eric Novotny, Interview with author, Washington, DC, October 1, 2010.
48 Ibid.
49 Ibid.
50 Ibid.
51 Ibid.

companies should be to name, blame, and shame them into reforming their practices on the subject.

Aside from the options previously discussed with regard to legal frameworks to address this issue, either coming from the United States or internationally, there are several alternative policy options to consider. Here, I will examine four: (1) use of the Foreign Corrupt Practices Act, (2) development of policies by individual business groups, (3) promotion of a "naming, blaming, and shaming" effort, both by the United States and the international community, and (4) strengthening of US diplomacy efforts.

Use of the Foreign Corrupt Practices Act (FCPA)

The FCPA was enacted in 1977 to prevent actions of bribery on the part of US companies operating abroad. The act makes it illegal for a company to provide anything of value to a government official to get preferential treatment.[52] The question becomes whether or not the provision of information to government officials, as occurred with Yahoo! and other companies, serves as the provision of something valuable. Certainly, the Chinese government would find such information valuable, as it values preventing dissidents from disturbing the rule of the current regime. However, how is something of value defined within the law? Unfortunately, there is no specific definition laid out for an item of value, under this regulation. Further, even if we were to take a liberal view of the definition of something of value to include private information, as per the Department of Justice, we must still show that the information was given with "corrupt intent" or the intent to have a foreign official ignore his professional duties in order to funnel more business to the company in question.[53] None of the actions of Yahoo! or any of the other companies in question would indicate they have done any more than merely work within the framework of the Chinese system to maintain business there, and thus their efforts have not been to funnel more business to them. In the case of Google, which did not have a large market share in China, this is especially noteworthy. These actions seem to actually conform to the jobs of the various foreign officials, making the Foreign Corrupt Practices Act untenable in this situation.

Viner notes that the Global Online Freedom Act is "analogous" to the FCPA in that it gives jurisdiction to the Department of Justice and is extremely clear regarding these issues.[54] However, while she notes that the FCPA has been the hallmark of legislation similar to the Global Online Freedom Act since its inception, she makes no attempt to argue for its use in battling these problems. Rather, she uses the presence of the FCPA to argue for the passage of the Global Online Freedom Act. This pending piece of legislation has its own issues, which we have already investigated, but Viner's discussion shows that the FCPA has problems of its own. Namely, it is too focused on bribery and corruption to be re-tasked to focus on internet censorship and privacy violations. Further, if the Global Online Freedom Act is the new leg-

52 The Foreign Corrupt Practices Act of 1977, 15 U.S.C. §§ 78dd-2.

53 "The Foreign Corrupt Practices Act, Anti-Bribery Provisions: Lay Persons Guide," *The United States Department of Justice Fraud Section,* accessed November 10, 2010, http://www.justice.gov/criminal/fraud/fcpa/docs/lay-persons-guide.pdf.

54 Viner, "The Global Online Freedom Act" 390.

islation that does just that, examination of the Global Online Freedom Act shows that such a re-tasking is inefficient at best, and, at worst, actually damaging to privacy, given Viner's concerns about Section 201.[39]

Corporate Codes of Conduct and Policies Developed by Business Groups

Often, problems such as these have to be regulated by internal controls. Companies and their respective trade associations must come together and develop policies for such issues. A classic example of this regarding the internet is Google. Google states that one of its core principles is that the company can "make money without doing evil" and that "the need for information crosses all borders."[55] Further, one could argue that the Global Compact, as described above, is a form of trade association language, articulating a series of general principles regarding business practices and human rights. However, such general statements have clearly failed as a method for ensuring that companies do not engage in corporate complicity regarding human rights abuses. Thus, what is needed is a more specific form of trade association policy or corporate code of conduct. However, such a code of conduct or policy is difficult to devise. Novotny explains that this is because trade associations and business groups must conform to the lowest common denominator to please all of their members. Thus, truly controversial issues such as this one or the issue of net neutrality receive little in the way of concrete, specific regulations because the members have difficulty in agreeing to terms on the subject. The major problem in this situation is that each of these companies is playing an active and different role within this system and, thus, each has different viewpoints.[56] This inherent confusion makes the use of trade association or corporate policies alone meaningless. Thus, we must try to add other measures to this discussion, involving governments and non-governmental sources.

Naming, Blaming, and Shaming

The idea of naming, blaming, and shaming has existed in the human rights discourse for quite some time. The idea, according to Emile M. Hafner-Burton, is to take a country, call it out for its actions, and blame it for its actions, with the hope of shaming it into stopping the action in question.[57] However, if such tactics have been used against countries, could they not also be used against corporations that engage in actions found to be in violation (or complicit in the violation) of human rights? Hafner-Burton makes the point that, largely, these tactics are effective in bringing about things like elections or political protections, noting that these tactics seem to have the most trouble in stopping governments from terrorizing their citizenry.[58] Such actions could easily be combined with boycotts and other measures that affect the bottom line of these companies. As Novotny puts it, only about one percent of the base for Google or for Yahoo! exists in China. Thus, there seems to be little reason for

55 "Our Philosophy, No. 6 and No. 8," last updated September 2009, accessed November 10, 2010, http://www.google.com/intl/en/corporate/tenthings.html.
56 Novotny, Interview.
57 Emile M. Hafner-Burton, "Sticks and Stones: Naming and Shaming the Human Rights Enforcement Problem," *International Organization, 62*(4): 689.
58 Ibid., 691-92.

these companies to make such a moral compromise for this limited share.[59] However, he also notes that many of these companies may pursue such issues regardless of the moral questions involved because it is difficult to present a logical economic argument as to why you refuse to enter into a country that has one fifth of the world's population, simply because the process is "hard."[60] Thus, again, we can see the pull of the market in China. For naming, blaming, and shaming tactics to work effectively, they would likely have to be aimed at three targets. The first is the company in question. The second would have to be the Chinese government, and the third would have to be the United States government. This third element would be implemented to combat the policy paradoxes presented by the United States, which could provide cover for the companies or the Chinese government going forward.[37]

A major problem with the use of naming, blaming, and shaming techniques may be one of politics. As Hafner-Burton puts it:

Whether and how naming and shaming works might also depend on when and where the spotlight is shone. Organizations—whether NGOs, news media, or the UN—shine the spotlight selectively. Some countries guilty of horrible abuses never draw much publicity, while others responsible for lesser abuses draw much attention. For instance, political terror has been widespread in Uganda and North Korea for decades, yet these countries receive far less publicity from the international community than do Cuba, China, South Africa, or Turkey, which are more often put in the spotlight for less severe abuses.[61]

Considering that China has had a history of claiming Western Imperialism, such a double standard could be extremely detrimental to the effectiveness of these tactics. However, if organizations and others are careful to aim their tactics squarely at the companies and make sure that they also address the issues cited above that pertain to the United States, these tactics might be somewhat effective. In the end, Hafner-Burton is probably right in declaring such actions to not be simply "cheap talk" but not a cure-all either.[62] To truly make these actions effective, they should be combined with strong diplomacy from the United States and a newfound push for stronger and more specific trade association policies, which could come as a result of these campaigns.

Stronger US Diplomacy

Perhaps one of the most effective measures that could be taken would be a stronger position by the United States government regarding these issues. With a major international hegemon like the United States pushing on the Chinese to stop these actions, more headway could be made. However, as Novotny states, the major problem is that the U.S. Department of State has been incredibly uneven on this topic. It appears for brief moments, such as in statements made by Secretary of State Hillary Clinton in January 2010, but then it fades away. Clinton said in January 2010:

59 Novotny, Interview.
60 Ibid.
61 Hafner-Burton, "Sticks and Stones," 694.
62 Ibid., 707.

On their own, new technologies do not take sides in the struggle for freedom and progress, but the United States does. We stand for a single internet where all of humanity has equal access to knowledge and ideas. And we recognize that the world's information infrastructure will become what we and others make of it. Now, this challenge may be new, but our responsibility to help ensure the free exchange of ideas goes back to the birth of our republic. The words of the First Amendment to our Constitution are carved in 50 tons of Tennessee marble on the front of this building. And every generation of Americans has worked to protect the values etched in that stone.[63]

Novotny notes that this problem with the U.S. position may be compounded by two facts. First, the United States has weakened its position regarding its telecommunications immunity laws and the presence of companies like Narus, which engage in actions that may actively violate the privacy of dissidents. Second, the United States may have finally recognized that China has become too powerful economically and that our economic clout no longer carries the requisite leverage for this kind of heavy handed diplomacy.[64] Also, Novotny points out that the reason we reopened our relations with China was to try and use free market tactics to liberalize their system.[65] It would seem unlikely, then, for the government to attempt to strong arm the Chinese on this issue, instead falling back on capitalist adages about the invisible hand of the market leading to greater freedom. However, at the very least, a consistent position by the State Department should be taken on this subject in order to allow for other measures—including naming, blaming, and shaming—to have an impact.

Policy Recommendation

In order to solve the problems put forth by the Chinese regime's attempts at internet censorship and the use of the internet to gain private information about dissidents, something more than a single-pronged approach is necessary. Mere legislation or corporate policies will not be enough to stop such a problem. The reason for this is simple. There are too many players and too many variables within this system. Without a multi-pronged approach in which actions are taken to give one solid outcome—specific and enforceable laws and policies on the subject—the system becomes increasingly confusing and unenforceable. This can be seen from the failure of the Global Compact and the inability of the Global Online Freedom Act to be passed. As long as there is no unified response from the United States government and no unified campaign from the media, NGOs, and others, we can expect little change on this subject.

Thus, this author recommends the following actions:

A vigorous naming, blaming, and shaming campaign should be conducted. The major targets should be (in order): the individual companies, the Chinese government, and the United States government. This campaign should target the actions of the companies and the policies of the Chinese government, while admonishing the United States for its recent

63 Hillary Clinton, "Remarks on Internet Freedom," *United States Department of State*, January 21, 2010, accessed November 27, 2010, http://www.state.gov/secretary/rm/2010/01/135519.htm.
64 Novotny, Interview.
65 Ibid.

telecommunications immunity bills, which have only served to muddy the waters on this issue. This campaign should be supplemented by boycotts and other measures that could have effective economic impacts on the companies in question and their various advertisers. Any actions taken against the United States government should call for the immediate repeal of the telecommunications immunity laws so that the United States can put more forceful and meaningful pressure on authoritarian governments, such as the Chinese. In place of such laws, legislation like the Global Online Freedom Act would be beneficial. However, without removing immunity provisions, these laws would do little but provide a confusing and uneven international legal landscape.

The US government should adopt a uniform policy for addressing the Chinese government on these issues. The US government must choose whether or not to focus on the macroeconomic issues within their relationship with China or the human rights issues. Human rights issues can no longer vanish from the discussion only to reappear again later. Further, this paper would strongly urge the repeal or, at the very least, rewording of the telecommunications immunity laws that were put into place during the War on Terror. These laws do little more than confuse this issue and give the Chinese government and the various companies involved a place to hide, arguing that the United States government is engaging in activities that are hypocritical by having such laws on the books. Passage of legislation similar to the Global Online Freedom Act would also be helpful, but not without first removing the telecommunications immunity legislation currently on the books.

Based off of these two actions, trade associations and companies must come together and attempt to develop coherent, enforceable, and specific codes of conduct that discuss issues of censorship and privacy regarding the internet, their customers, and foreign governments. It would be especially important to include a discussion of how a company handles working with a third party within a foreign country (such as in the Yahoo! case) and how it handles laws that go against the general spirit of their corporate principles (as in the Google case). Further, these codes could help untangle situations in which third parties, such as hackers, violate privacy in ways unknown or unintentionally allowed by the company in question. Certainly, such situations are not as grave as situations in which a company hands information over to an authoritarian government. However, these situations should be mentioned, particularly in discussing methods to investigate such actions. Through investigation, culpability could potentially be placed. This could occur either for negligent officials and cyber criminals or for government officials shown to be sanctioning such actions.

Conclusion

This paper argues that a three-pronged approach, while not a perfect solution to this problem (there is truly little that can be done if China still wants to invade the privacy of its citizens) is the best solution to this problem, given the circumstances. That is to say that this multi-pronged approach is certainly better than the current single-pronged approach. This is because, by adding in a unified campaign of naming, blaming, and shaming, the international community might be able to force one party within this issue to alter their policies on this matter. Most likely, the companies themselves would be forced to alter policies because of the

possibility of tangible, economic losses that could be suffered due to the boycotts and other measures that should be combined with the naming, blaming, and shaming efforts. However, in order to work effectively, this campaign will need to be bolstered by no less than a unified response from the US government. The issue of human rights in the US-China relationship cannot keep disappearing and reappearing. The telecommunications immunity laws that have been passed by the United States are an Achilles Heel to this issue, forcing the United States to push forward and back pedal on this issue at all times. Removing this possibility by passing more stringent legislation would enable the United States to force the Chinese to be more mindful of international norms regarding privacy.

References

Buckley, Chris. "China Internet Population Hits 384 Million." *Reuters*. January 15, 2010.

Cannici, William Jr. "The Global Online Freedom Act: A Critique of its Objectives, Methods, and Ultimate Effectiveness Combating American Businesses that Facilitate Internet Censorship in the People's Republic of China." *Seton Hall Legislative Journal 32*(2007-08): 123-166.

Clinton, Hillary. "Remarks on Internet Freedom." *United States Department of State*. Last updated January 21, 2010. Accessed November 27, 2010, http://www.state.gov/secretary/rm/2010/01/135519.htm.

Cohn, William. "Yahoo!'s China Defense." *The New Presence 10*(2): 30-33.

Deva, Surya. "Corporate Complicity in Internet Censorship in China: Who Cares for the Global Compact or the Global Online Freedom Act?" *George Washington International Law Review* vol. 39. 2007. 255-319.

---. "Global Compact: A Critique of the UN's "Public-Private" Partnership for Promoting Corporate Citizenship." *Syracuse Journal of International Law and Commerce 34*(2006-2007): 107-151.

FISA Amendments Act of 2008. *US Code*. Title 110. Section 201.

Foreign Corrupt Practices Act of 1977. 15 U.S.C. §§ 78dd-2.

Google. "A New Approach to China: The Official Google Blog, January 20, 2010." Accessed May 31, 2010, http://googleblog.blogspot.com/2010/01/new-approach-to-china.html.

---. "A New Approach to China: The Official Google Blog, March 22, 2010." Accessed May 31, 2010, http://googleblog.blogspot.com/2010/03/new-approach-to-china-update.html.

---. "An Update on China: The Official Google Blog, July 9, 2010." Accessed November 10, 2010, http://googleblog.blogspot.com/2010/06/update-on-china.html.

---. "Google China." Accessed November 10, 2010: http://www.google.cn.

---. "Google Corporate Information: Our Philosophy, No. 6 and No. 8." Last updated September 2009. Accessed November 10, 2010, http://www.google.com/intl/en/corporate/tenthings.html.

Hafner-Burton, Emile. "Sticks and Stones: Naming and Shaming the Human Rights Enforcement Problem." *International Organization 62*(4): 689-716.

Human Rights Watch "Race to the Bottom: Corporate Complicity in Chinese Internet Censorship." *Human Rights Watch 18*(8).

Information Warfare Monitor. "Tracking GhostNet: Investigating a Cyber Espionage Network." *Information Warfare Monitor.* March 29, 2009.

Lewis, James. "Cyber Attacks Explained." *CSIS Commentary*. June 15, 2007.

MacDonald, Jeffrey. "When Yahoo! in China is Not Yahoo!" *Christian Science Monitor 98*(55).

Marqueland, Robert. "Yahoo!, Chinese Police, and a Jailed Journalist," *Christian Science Monitor 97*(201).

Novotny, Eric. Interview with author. Washington, DC. October 1, 2010.

United States Department of Justice. "The Foreign Corrupt Practices Act, Anti-bribery Provisions: Lay Persons Guide." *The United States Department of Justice Fraud Section.* Accessed November 2010. http://www.justice.gov/criminal/fraud/fcpa/docs/lay-persons-guide.pdf.

Viner, Nellie. "The Global Online Freedom Act: Can U.S. Internet Companies Scale the Great Chinese Firewall at the Gates of the Chinese Century?" *The Iowa Law Review 93*(2007-2008): 361-392.

Watts, Jonathan. "How Internet Giant Google Turned on Gatekeepers of China's Great Firewall." *The Guardian*. January 14, 2010.

"Yahoo!'s Defense in Case of Jailed Dissident." *Business Week Online*. November 7, 2007.

Fiscal Implications of Legislative and Executive Term Limits at the State Level[1*]

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Abstract

Proponents of term limit legislation have long maintained that these institutional constraints would end the era of the "career politician". One justification for doing away with senior representatives is the argument against a culture of spending which supposedly indoctrinates the longest serving members in government who seek reelection regularly. Recent work has demonstrated that adoption of term limits had the unintended consequence of increasing spending levels—a finding which would surprise diehard advocates of the reform. As with all scientific findings which are incorporated into our working knowledge, findings must be consistent across empirical studies. Questions which seek to better understand how fiscal appropriation responds to institutional changes are perhaps the most important to theory-building and are therefore worth revisiting. Using a set of economic and political indicators, to include legislative and gubernatorial term limits, captures much of the variance we observe in state expenditures. In contrast to previous research, results here indicate that term limiting legislators does not affect overall state spending at traditional confidence intervals. Moreover, improvements to previous models suggest that term limits have a differential effect on expenditures when imposed on state senators, state house members and on governors. This pattern is not surprising given that member goals are shaped by their unique institutional orientation which responds to rule changes in equally distinctive ways.

Introduction

This article began as a replication of a study that found state legislative term limits had the unintended consequence of increasing expenditure levels. Once I collected the data and began inspecting it, patterns emerged that stood in contrast to the conclusions put forth in the original publication. What follows is a review of the original work and the improvements I have been compelled to make along the way. The term limits story is far more complex and a great deal more nuanced than originally thought.

I begin this article with a short description of the study I began replicating. From here, I give an abridged overview of the relevant literature in order to situate the research question and to justify the merits of the study. Next, I review the methodology of the original article so that the reader understands the task at hand. In this section, I pay close attention to methodological issues I aim to address as I revise the model. Then the method that will be used for the present study is laid out in some detail. This discussion should make clear any adjustments I have made to the original work with respect to data sources, coding variables, and regression analysis. Finally, I demonstrate the results in words and graphics, including several regressions. For purposes of comparison, regressions from the original paper are also reported. Several variables omitted from the earlier analysis are included in this model, and the findings suggest that these revisions improve our understanding greatly. Since the original data was unavailable for replication, a portion of the results section is also dedicated to addressing the comparability of these two studies. I conclude by discussing research outcomes, acknowledge lingering questions on this topic, and providing directions for future research.

One recent study by Abbie H. Erler (2007) on the effects of state legislative term limits suggests that the advent of this "reform" brings higher levels of government spending, a finding that defies conventional wisdom on the subject. Fortunately, the data used can be generated readily using a number of resources including the National Governors' Association, the National Association of State Budget Officers as well as U.S. Census data on economic and social indicators now widely available on the internet. My analysis of *Legislative Term Limits and State Spending* will be as much an effort to replicate the findings as to improve upon the method. The data presented by Erler (2007) has several shortcomings that I hope to address.[2]

Term limits are a hot-button issue in many states as well as in the US Congress. Advocates on both sides have logical reasons for taking their position. Proponents of term limitations have long argued that the reform will oust career politicians along with the loose spending habits they develop.[3] Opponents claim that senior politicians provide the fiscal discipline that comes with experience in the legislature. Still others contend that representatives in the state house and senate often have many years to execute their political aims, efforts which invariably cost taxpayers. By reducing the number of terms members can serve, the personal

2 The merits of this study will not be fully entertained here since they have been justified in the original paper. I should be clear at the outset what this study is and what it is not. The goal of this research is simply to observe and measure the relationship between term limits and spending, not to make causal arguments about their association.
3 Robert W. Reed et al., "The Relationship between Congressional Spending and Tenure with an Application to Term Limits," Public Choice 94 (1998): 98. For a discussion of incumbent pork spending as a reelection strategy see Barry Weingast (1994) on universalism and Robert M. Stein and Kenneth N. Bickers (1995) on particularistic constituency benefits.

goal of making good public policy must be achieved hurriedly before a legislator is term limited.[4] Some champions of term limits see reelection as a perpetual incentive to dole out constituency benefits in exchange for votes, a pattern that puts fiscal burdens on the state tax pool.[5] Another empirical study on the issue will certainly not put an end to debate; rather, this investigation has higher aims. In fact, the following study may provide insights into the institutional incentives, or more appropriately, the institutional constraints, that affect fiscal policy outcomes at the state level.

Method: Erler (2007)

To measure the effects that term limits have on state spending, Erler "analyzed fiscal data from 47 continental US states from 1977-2001."[6] The unit of analysis is the state-year during the panel. Her dependent variable is "general spending" which includes investments in "education, highways, welfare and interest on the debt," however general spending is not used in the final analysis.[7] Data sources for the original research were drawn from the "Statistical Abstract of the United States, State Government Tax Collections, (sic) the Fiscal Survey of the States and the Book of States".[8] Although the author provides information about data collection, she does not reveal which resources were used to extract variables. For instance, state expenditure data is available both in the Statistical Abstract of the United States (SAUS) and in the Fiscal Survey of the States (FSS) publications.

The theoretically important variable in Erler (2007) is the implementation of term limits in the state legislature, which she translates into a dichotomous variable. Within the panel, the intuitive procedure would be to code states with 1 when term limits were in place and 0 otherwise in a particular year. Erler (2007) instead believed that this process would not allow for the anticipation legislators would feel two years prior to being term limited. This logic informed her decision to essentially lag term limits by one year in states who adopted the legislation. Handling term limits in this way had major implications for way the data was coded. Missouri began limiting its legislators in 2002, however Missouri is considered a "term limits state" in the original sample because of the coding system outlined above. Within the group of states with term limits, there are also several which had not fully implemented term limits when the panel expires in 2001. Some states had term limited their house members prior to 2001 but had not yet had constrained state senators due to the longer terms in that chamber. Evidence presented later suggests these factors could have heavily distorted the results.

4 Richard Fenno (1978) demonstrates that legislators have three major goals: reelection; power or influence within the chamber; and so-called good public policy. Term limits have obvious ramifications for the goal of reelection and potentially less explicit effects on the latter two. Influence within the chamber is traditionally tied to seniority, a norm which would be undermined with tenure limitations. Potential impacts on the pursuit of good public policy are discussed in the text.

5 Doug Bandow, "Real Term Limits: Now more than Ever," Cato Institute's Policy Analysis 221 (1995) and George F. Will, Restoration: Congress, Term Limits, and the Recovery of Deliberative Democracy (New York: Free Press, 1992).

6 Erler (2007) justifies dropping Nebraska from the sample since that state has nonpartisan election; Hawaii because public school expenditures come from the state instead of local municipalities; and Alaska because the majority of their revenue stream comes from oil and not taxes.

7 Abbie H. Erler, "Legislative Term Limits and State Spending," *Public Choice* 133 (2007): 482. The dependent variable in the original regression tables include spending per capita and spending as a percent of overall income.

8 Erler, "Legislative Term Limits and State Spending," 482.

One other consideration that Erler (2007) recognizes is that adoption of term limitations is probably not entirely an exogenous institution. This pattern is undeniably clear when one looks at which states have adopted the constraint and which states have not. At one time or another between 1977 and 2001, the following states began limiting the number of terms their state representatives could serve: Arizona; Arkansas; California; Colorado; Florida; Maine; Michigan; Montana; Ohio; and South Dakota. Any student of state politics recognizes these states as among those who have the public initiative option, a form of direct democracy. State representatives with potentially endless careers are not likely to self-impose these constraints. Therefore, the ballot option allows voters to impose term limit laws on their elected representatives in these states. Despite this clear pattern, Erler (2007) considers term limits to be "an exogenous institution."[9] We might also believe that among states with referendum or initiative voting, higher levels of spending drive support of term limits legislation within the electorate.

Erler (2007) distinguishes between strong and weak term limit laws, a variable that taps qualitative differences in the language of term limit legislation. The variety of term limit legislation includes those placing a "cap" on the number of terms served, while others require members to take time off (after being term limited) before running for office again. Several term limit laws apply to the cumulative number of terms a member has served in the house and senate. Still other states prevent members from serving anywhere in government after their tenure has expired. The objective severity of term limit legislation may have implications for state spending but in further dividing a small treatment group Erler (2007) sacrifices the generalizability of her results.

Previous literature also guided Erler's decision to include several control variables that are known to affect spending on the state level. Alt and Lowery (1994) demonstrate the importance of personal income, the state-wide unemployment rate and federal grant revenue, as these all affect expenditures. Reed (2006) argues that the party of the governor and the population density also explain some of the variance we observe in spending levels across states over time. As a result, these control variables are included in the original article. Erler (2007) used the quadratic form of income, density and unemployment instead of the raw values. Squaring income is conventionally done to normalize the distribution of observations, however density and unemployment are seldom seen in this form. In Erler's (2007) coding scheme, the governor's party is a dummy variable which takes on a value of 1 if the governor is a Democrat and 0 if she is a Republican. Again, the original article does not reveal the source of political variable data so replication data may not be identical.[10]

To analyze these data and test the relationship between term limits and state spending, Erler (2007) uses "linear cross-sectional time series models…estimated using OLS with panel-corrected standard errors" which were "corrected for first-order correlation".[11] The regression analysis also employed fixed effects for state and year to control for variation that was specific

9 Erler, "Legislative Term Limits and State Spending," 485.
10 The descriptive statistics in the Appendix reveal that data generated by the author is roughly the same as that used by Erler.
11 Erler, "Legislative Term Limits and State Spending," 485.

to the time period and states in the sample. The results from the original study can be found in Table 3 in the column labeled "Erler (2007)".

Design and Analysis

The present study is technically an attempt to replicate Erler's work, although some important changes have been made. Improvements to the original model are addressed throughout this section. To test the relationship between spending and term limits, I rely on a multiple interrupted time series design with comparison groups. The main advantage of this design is that it allows the researcher to isolate the effect of the treatment (term limits) by comparing outcome variables for the treatment and control groups both before and after the treatment is applied. This type of study is technically a quasi-experimental design because the treatment is administered exogenously however Erler (2007) and I both agree that term limits are not purely exogenous.

Variables for the replication study are substantively indistinguishable from those employed in the original paper although there remain questions with respect to Erler's (2007) data sources.[12] The main theoretical variable is whether or not a state had term limits in place; information that is widely available on the internet. My data on term limits came directly from a term limit bulletin released by National Conference of State Legislatures.[13] As mentioned, Erler (2007) lagged this variable, meaning that states who implemented term limits would be coded 1 two years before any members were to be term limited. There is some justification for altering the data in such a manner, but doing so compromises our ability to isolate the effect of term limits given the possibility of multiple treatment interference. Dummy variables that pick up more than one moving part are likely to capture effects that are beyond the scope of the theoretically important variable. If we conceptualize term limits as an institutional constraint that begins to affect spending habits before it is in place, we assumed the very relationship we are trying to test. Given the tautological risk of assuming when members begin to react to term limit laws, it is better to begin with a narrow definition of term limits than one that is too encompassing.

For states who were early adopters of term limits, legislators understand that they will be subject to term limitations from the day they are elected, yet there is no way to apply term limits only to a subset of members and track their spending habits individually. I agree that members may change their behavior in anticipation of being term limited; however time series analysis is employed for this very reason—the effect of term limits may not be noticeable right away and if treatment effects are strong enough they will be observed as the pool of legislators facing tenure constraints grows in size. Nonetheless, we are most interested in the overall effect of this institutional change without guessing how far in advance members begin reacting to their tenure limits. Coding the data intuitively (1 for the first year members are term limited) still measures the year preceding the exit of term limited legislators.[14] This cod-

12 I contacted Erler in order to clarify the sources of her data, however she did not respond. A request for the data used in her article was also refused.

13 Data were obtained from the following website: http://www.ncsl.org/Default.aspx?TabId=14842

14 This modified coding scheme technically eliminates Missouri from having any term limit observations within the panel seeing as its term limit legislation took effect in 2002. For purposes here, it is considered a non-term state.

ing scheme is also more consistent with the argument against term limits which claims that representatives will "squeeze in" pet projects just before their time is up.

The main dependent variable, state expenditures per capita, was generated using figures published directly by the U.S. Census Bureau. State level data on what the census calls "general expenditures" was divided by yearly population figures thereby creating expenditures per capita.[15] Data on unemployment rates are sourced from the Bureau of Economic Affairs, a branch of the Census. The figures represent the average state unemployment in a given year and were squared to match the original data. Total personal income within a state (in real U.S. dollars), the amount of revenue from federal grants and land area in square miles (for calculating density) were all taken from the U.S. Statistical Abstract, grants and income were subsequently squared as in Erler (2007). All Census data used here was made available upon request in a excel spreadsheet.[16] The governor's party is also a dummy variable coded 1 when the governor is a Democrat and 0 otherwise. This information was provided by State Politics and Policy Quarterly as was data on unified government. Unified government, a dummy variable, is coded 1 when the governor and both chambers are of the same party and 0 otherwise.[17] In extremely rare cases, the governor is replaced in the middle of his term by someone of the opposite party. Instead of dropping observations, I coded the variable with the fraction of time that the Democrat was in power. For instance, 9 months of Democratic control and 3 months of Republican control would be entered as .75.[18] I should point out that because data sources in the original work remain uncertain, we cannot be sure that the data used for replication came from the same sources. Descriptive statistics in the appendix indicate that the original article used a different indicator of income and perhaps grants.[19]

The reader can compare the descriptive statistics from this study to those of Erler (2007) in Appendix, Table 4. The most striking differences are in the "income^2" column and in the "term limits" column. It is possible that income was drawn from a different source or operationalized differently than the measure of income used here. The Census is the most authoritative source on state income levels, so we can be confident that our results are as reliable, if not more reliable, than those from the original article.

The other major difference is in the mean scores of "term limits", the variable we are most interested in. The result of lagging this variable as in Erler (2007) would mean the inclusion of 22 more observations for states with term limits. It appears that her unique coding scheme accounts for this disparity.

15 "General Expenditures comprises all expenditure except that classified as liquor store, utility, or insurance trust expenditure. As noted above, it includes all such payments regardless of the source of revenue from which they were financed." See also: http://www.census.gov/govs/www/class_ch8.html#S8.2

16 I am grateful to Russell Pustejovsky, Statistician, State Finance and Tax Statistics Branch, Governments Division, U.S. Census Bureau for sending me state-level data from the early 1940's in manageable form.

17 From Stefanie A. Lindquist (2005), "Predictability and the Rule of Law: Overruling Decisions in State Supreme Courts." Available at: http://academic.udayton.edu/SPPQ-TPR/tpr_data_sets.html

18 This method has demonstrated its validity in several setting. For a discussion of this measurement schema see Mark A. Smith, "The Nature of Party Governance: Connecting Conceptualization and Measurement," American Journal of Political Science 41, no. 3 (1997): 1042-1056.

19 Erler (2007) did not provide descriptive statistics for her "grants" variable.

In addition to the variables included in the original analysis it seems appropriate to improve the model where important factors were overlooked. Looking further into term limitation legislation I notice that state house and state senate term limit laws do not always go into effect at the same time. Given the staggered nature of representatives' terms, the law could not affect both chambers at exactly the same time. To accommodate for this nuance I broke out term limits into two separate variables in the later analyses.

Although density is included in the original analysis, it does not necessarily capture the way in which state demographics affect economies of scale. Money spent on public goods within each state is efficient where populations are concentrated however overall population also plays an independent role. If high density helps states spend money efficiently per unit of area, population helps boost expenditure efficiency per person. The state will inevitably provide some basic services that cost taxpayers money but because the initial investment in infrastructure, education and the like will be the most costly, population increase will distribute the cost (to a certain point) while lifting individual tax burdens.

Take highways for example: state governments have partially shouldered the burden for building a modern highway network. The cost is determined independently of the population in the state, however the more people with access to the good reduces its cost per capita. Notice that this dimension is different than the efficiencies from having a densely populated state (which most *geographically* small states have). If economies of scale affect expenditures per capita, both population and population density will help to explain more of the variance in the model.

Erler (2007) incorporates governor term limits into her model but only as a check on robustness. Governor term limits are not a new idea and many states have this institutional constraint embedded in their state Constitutions however their effects are seldom studied. Nonetheless, it is a variable that may be impacting spending and is somewhat related to the expectation that term limits affect the spending habits of government. I include a dummy indicating whether or not state has term limits on their governor in the improved models.

In order to analyze the variables discussed above, I use a regression analysis similar to the one used by Erler (2007) estimated by the following model already described above.[20]

$$\text{Yit} = \alpha + \beta T \text{ it} + \omega C \text{ it} + \partial K \text{ it} + \varphi D \text{ it} + \varepsilon \text{ it}$$

Where Y represents state expenditures per capita, α is the intercept term, T is vector for the term limits dummy variables indicating whether or not a state had term limits at time t. T is specified three different ways in the regression; first as a unidimensional variable, then

20 Spending at year t-1 would also be a good predictor of spending at time t although the lagged expenditure variable was dropped because it was collinear with the other controls. The spending level at year t-1 could affect the party of the governor in year t as well as some of the other political and economic variables thereby leading to spurious findings. First order autocorrelation controls accommodate for part of outcome variation that is simply a function of prior spending within states over time, an acknowledgment of the autoregressive nature of state spending.

in bicameral perspective and finally to indicate constitutionally-mandated gubernatorial term limits. *C* is a vector of control variables used in the original work as well as here. *K* is a vector of variables that improve upon the original method, some of which necessitate that βT be dropped because of collinearity.[21] *D* is a vector of dummy variables that includes 46 state dummies and 24 year dummies excluding their respective reference groups. This vector holds constant any variation that is specific to particular years and particular states—so-called fixed effects. ε is the unobserved error which is assumed to be 0 in the estimating equation.

Erler (2007) claims that term limits are an exogenous institution, yet we suspect that spending and term limit legislation may be endogenous; that is, states with higher spending are more likely to support tenure limits with hopes of reigning in expenditure levels. As I have mentioned, the initiative process is a fair predictor of which states adopt term limits laws. Therefore, it seems a convenient instrumental variable since it affects adoption of term limit laws but it does not necessarily affect levels of spending.[22] Using similar notation as above we arrive at the following two stage equation.

$$T_{it} = a + B_{it} I + \mu_{it}$$

$$Yit = \alpha + \beta \hat{T} it + \omega C it + \partial K it + \varphi D it + \varepsilon it$$

Where $\hat{T}$ is the estimated value of having term limits in place as a function of I, a dummy denoting whether or not a state has the initiative process.

Econometric results which follow were generated using time-series ordinary least squares estimators with panel corrected standard errors. Fixed effects were also included. All significance tests are two-tailed with minimum 95% confidence intervals. Because non-independence of observations is a potentially serious problem for state-level time series data, I used the Durbin-Watson statistical correction for serial autocorrelation which detects correlation in the residuals and normalizes them. Regressions were computed using STATA 10.

In addition to regression analysis, I performed several different types of t-test's in order to test whether states who adopt term limits have higher spending levels than those who do not. I rely on the t-statistic again when I use a difference-in-differences test to compare changes over time in the treatment group with change over time in the group of states who failed to adopt term limit legislation during the sample frame.

Results

A simple t-test reveals that states that adopted term limits and states who did not, have statistically identical expenditures per capita, both in the time period before any state had implemented term limits and in the short time afterwards. Cut points for separating the time period before and after term limits became popular are identical to those used in the original

21 When I separate term limits into house term limits and senate term limits, the simple term limits variable is eliminated.

22 Jeffrey S. Zax, "Initiatives and Government Expenditures," Public Choice 63 (1989).

paper. The complete results from the t-test as well as a visual representation of expenditure levels can be seen below. These findings quickly put to rest my suspicion that term limit adoption and spending levels are an endogenous institution. Figure 1, convincingly illustrates that term states (mainly the initiative-referendum states) have roughly equal expenditures per capita as those states who failed to adopt term limits in the sample frame.

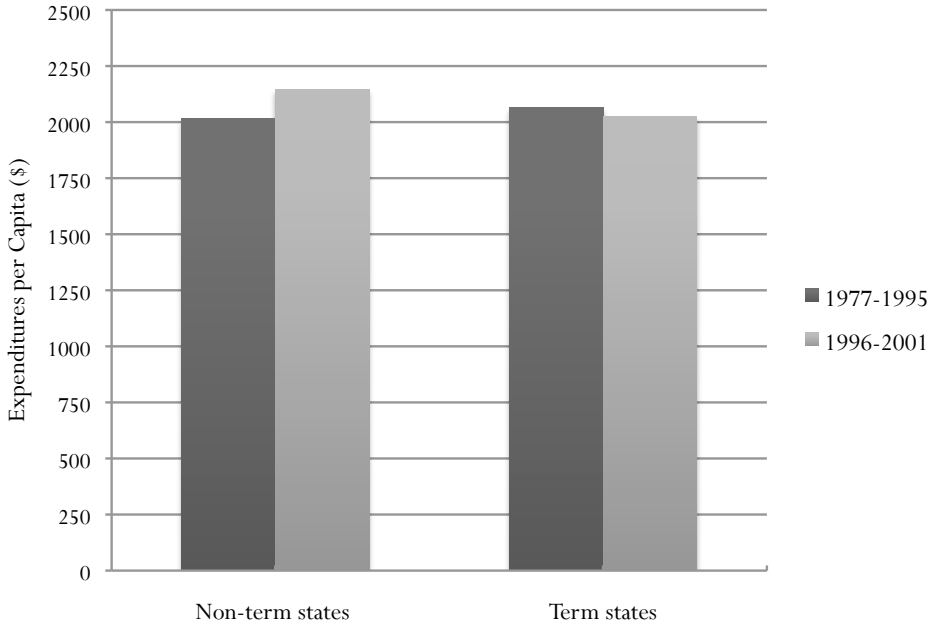
Table 1, Student's T-test, Expenditures per Capita for Treatment and Comparison Groups, 1977-1995

	N	Avg.	Std. Error	
Non-term states	703	2016.70	35.95	
Term states	190	2062.68	70.17	
Combined	893	2027.46	32.05	
Difference		-45.98	75.73	
				t ≈ -0.61
				df = 891

Table 2, Student's T-test, Expenditures per Capita for Treatment and Comparison Groups, 1996-2001

	N	Avg.	Std. Error	
Non-term states	222	2144.21	71.04	
Term states	60	2022.90	109.36	
Combined	282	2115.82	60.12	
Difference		121.31	142.07	
				t ≈ 0.85
				df = 280

Figure 1, Expenditures per Capita for Term Limit States and Non-term Limit States



In addition to t-tests in each time period, a difference in difference test was employed to establish whether the change in spending per capita was significantly different for the term limit states compared to those states who failed to implement term limit legislation. The t-statistic for the difference in difference model (implied in Figure 1) is -1.09, indicating that the change in expenditure levels between the treatment and control groups were not significantly different in each of the time periods. Therefore, we fail to reject the null hypothesis that changes in per capita expenditures between the two groups are equal.

Although t-tests are useful statistical measures, they are blunt. From t-tests we cannot rule out that changes in spending levels in each of the groups were from term limit laws. Observed changes in spending might have been more or less dramatic if other intervening variables were not in the picture. To hold other variables constant over the entire time period, multivariate regression analysis is necessary. The full results can be found in Table 3. The first column is simply copied from the original study for purposes of comparison; Column 1 is the column that I hope to replicate. The figures in Model 1 (column 2) represent my replication of Erler (2007) using the same variables and a nearly identical method of analysis. The only change made to the original method is the coding of term limits which has already been discussed. In Model 2, I drop the term limits variable in order to measure separate indicators of term limits in the state house and state senate. In model 3, I introduce two variables; a dummy variable for whether or not there is gubernatorial term limits and total state population. Column 4 is an attempt at using an instrumental variable approach. In this case, the term limits variable is actually the fitted values for term limits which were predicted using a dummy variable for the initiative process.

Table 3, Effects of Term Limits on State Expenditures per Capita, 1977-2001

Independent Variables	**Erler (2007)**	**1**	**2**	**3**	**4**
Constant	__	4618.8*** (69.9)	4629.1*** (70.3)	4243.8*** (39.6)	4.61*** (.05)
Term Limits	59.8** (20.9)	-25.8 (35.5)	__	__	-11.4 (8.2)
Unified Government	-42.6** (13.4)	-46.3*** (11.3)	-44.8*** (11.4)	-60.4*** (11.3)	-.04*** (.01)
Governor Party (Dem=1)	32.8** (12.7)	24.9* (12.0)	24.7* (12.0)	23.7** (10.7)	.02 (.01)
Grants	.830** (.115)	.00001* (.000005)	.000008 (000006)	.00001* (6.92×10^{-6})	1.05×10^{-8} (6.6×10^{-9})
Income²	.0000001** (0000001)	-2.5×10^{-22} (1.6×10^{-22})	-1.5×10^{-22} (1.9×10^{-22})	1.0×10^{-21}*** (3.0×10^{-22})	-2.4×10^{-25} (2.1×10^{-25})
Population Density²	.0008* (.0004)	.0017*** (.0005)	.0017*** (.0005)	.0016*** (.0004)	1.7×10^{-6}*** (3.3×10^{-7})
Unemployment Rate²	.276 (.392)	.23 (.36)	.28 (.36)	.60 (.42)	-.002 (.003)
House Limits	__	__	159.7** (52.7)	174.7** (64.4)	__
Senate Limits	__	__	-212.2** (67.1)	-218.3** (68.8)	__
Governor Term Limits	__	__	__	487.1*** (52.3)	__
Population	__	__	__	-.0001*** (.00001)	__
Observations	1175	1175	1175	1175	1175
Number of States	47	47	47	47	47
Number of Years	25	25	25	25	25
R^2	.94	.97	.97	.97	.96

Note: Cell entries are unstandardized regression coefficients with panel corrected standard errors in parenthesis. Erler column represents the data presented in Abbie H. Erler, "Legislative Term Limits and State Spending," *Public Choice* 133 (2007): 485. The Erler (2007) column corrects for first order autocorrelation, the remaining models use Durbin-Watson autocorrelation controls. All models include fixed effect dummy variables for state and year (not reported).

* = p<.05; ** = p<.01; *** = p<.001

The regression results provide several statistically and substantively significant findings. In Column 1, we can see that the term limits variable does not reach conventional levels of significance. This suggests that conclusions from the original study may have been biased either because of the coding of the term limits variable or other data problems inconsistencies. With the exception of income^2, results from Erler (2007) are noticeably similar to those produced here. The direction, magnitude and significance of most coefficients are comparable in Erler (2007) and my basic regression found in Column 1. These include unified government, the party of the governor grants, population density and the unemployment rate. Unified governments spend about $46 per capita less than states with divided government and Democratic governors appear to outspend Republicans by roughly $25 per capita. An additional 100,000 dollars in federal grant money corresponds to an average increase in spending by about 1 dollar per capita. Given that state population levels are all over 100,000, we might infer that an additional dollar from the federal government results in one more dollar of state spending. These results are intuitive and consistent with those of Erler (2007). Because the findings are comparable on every variable excepting only term limits, we might suspect that the coding scheme proposed be Erler can account for her divergent conclusion. The reader will notice that the r^2 jumps from .94 to .97 between Erler (2007) and Column 1. This provides, at least superficially, evidence that coding the term limits variable intuitively fits the data better than if it is lagged.

Perhaps the most considerable contribution to the study of term limits is featured in column 2. Here we see that dividing the term limits concept into house limits and senate limits has a profound effect on the regression. Both of these variables reach high levels of significance and surprisingly move in opposite directions. The implementation of house term limits increases spending by about $174 per capita. Conversely, senate term limits are associated with spending levels that are $218 per capita less, when other variables are held constant.

The findings presented in column 3 are equally stunning. The coefficients and significance levels are not drastically altered for house and senate term limits while on average, we see that gubernatorial term limitations increase spending by about $487 per capita, a finding that is statistically significant at the p=.001 level. The overall population of a state also reduces spending levels, thereby supporting the economy of scale argument. An additional 10,000 people living in a state corresponds with an average decrease is spending per capita by about $10. Although the coefficient does not make a strong statement, this finding is substantively significant considering that state populations vary considerably and it is not uncommon for state populations to fluctuate greatly (even by 100,000) in a given year. We should also note that income^2 becomes significant in this model although the coefficient is difficult to interpret and as I've already mentioned this variable is primarily a control.

Column 4 was an attempt at using an instrumental variable approach to deal with the potential endogeneity between state spending and term limit adoption however this model performs poorly in comparison to the others. The values for unemployment, grants, income and population density are noticeably different than we might expect and are difficult to interpret because they are so miniscule. The only variable that is significant in this model is

population density although it is unclear why its coefficient is radically different than in the other equations.

Although this model considerably weakens the strength of the term limits variable, this may indicate the relative exogeneity of term limit adoption with respect to the variables included here. Results from the first stage equation (not reported) suggest that initiative voting is not a strong predictor of term limit implementation. In fact, the initiative dummy variable was not even significant when it was regressed on term limits, calling into question the reliability of the predicted values. Our initial reasoning for pursuing this approach was influenced by our suspicion that higher spending levels drove term limit adoption. Figure 1 and corresponding t-tests indicate that this was not the case.

Taken together, the results presented here are markedly different than those generated by Erler (2007). Differences between the data used here and the data used in the original study might account for this discrepancy. Census data is regarded as the only reliable source for unemployment, population density, and the other control variables used in the model. Descriptive statistics in the Appendix suggest the next obvious place to look for data problems is in the outcome variable, where mean expenditures per capita are nearly 800 dollars different in each of the studies. Spending data on the state level is provided by the U.S. Census, however a variety of other institutions distribute these data publicly. Probably the best known resource for expenditure figures is the National Association of State Budget Officers who annually (occasionally biannually) publish a booklet called the Fiscal Survey of the States. The Fiscal Survey of the States (FSS) is available online from every year in the sample, excepting 1977, and includes multiple measures of spending, revenue on-hand, and other useful information on each U.S. state. Again, I should stress that I am unsure about original data used by Erler (2007). If she was able to find FSS data for the entire sample, it could potentially explain why we came to such divergent conclusions.

I collected the FSS data since my original objective was to use multiple indicators for the dependent variable.[23] However, because the first year of the data was missing, using the FSS data would have created problems in the regression and introduce questionable assumptions into the model. Instead, I decided to assess whether the Census and FSS were measuring the same underlying concept of spending. If the Census and FSS are comparable (or interchangeable) indicators of spending, we can rule out this explanation for the different conclusions reached in the original and replication study. Confirmatory factor analysis is the conventional method to discern how many underlying measures indicators are tapping, so it is seems like the appropriate tool to use in this case.

Results from the matrix (not shown) suggest that among these two variables, measured from 1978 to 2001, only one principal factor emerges. We can safely assume that this factor is state-year expenditures. The eigenvalues are 1.93 for the first factor and -.02 for the second factor. The factor loadings, which are analogous to an r term, are roughly .98 for both the

23 Multiple indicators is always an effective way to improve robustness and augment internal validity. If the empirical story is consistent with multiple specifications, we can begin to evaluate the validity of the causal claim.

Census and FSS data. Therefore we reject the null hypothesis that the outcome variables are measuring two distinct concepts. In addition, these two indicators have a correlation of .97, further evidence that FSS and Census measures approach parity. If Erler (2007) used FSS data instead of the Census measures of expenditure employed here, it would not account for the contradicting conclusions.

Discussion

The results presented here make a strong case for revising our understanding of the relationship between term limits and state spending. Replication indicates that Erler's (2007) conclusions regarding the relationship between legislative term limits and expenditures was based, at least partially, on a coding scheme that accounted for term limits when they didn't exist. Improvements to the original model reveal several important nuances that should be incorporated into our knowledge of term limiting institutions. First, we learned that house term limits and senate house limits have significant effects on statewide spending although in different ways. Term limits in the state house increase spending, on average, while the same institutional constraint in the senate has the opposite effect. This finding is surprising at first glance however the fact that each chamber has different election cycles and varies greatly in membership size may indirectly explain why tenure limitation had unique effects on each state house. The short story is that the two chambers really *are* unique (and intentionally so) which conditions how each of its members behave in electoral and legislative settings.[24]

Most states who implemented term limits set a ceiling on years instead of terms. In most states members are allowed 8 years total, regardless of whether a member is from the senate serving 4 year terms or a house member with a two year term. Because state senator term lengths are at least twice as long, members elected to this house have fewer elections before they are term limited. It is likely that bicameral design interacts with tenure limits to have the impact we observe. Although more research might help uncover why the house and senate respond differently to term limits, this findings is a major improvement upon earlier work.

Another considerable conclusion we can draw from this study is that governors who are term limited spend considerably more money, on average, than governors who are not. The reason for this result is unclear but it likely has to do with the executive nature of the governor's role in state government. Although the governor is technically not responsible for the creation of "good public policy" during her tenure, it is likely that the legacy of governors is far more important than state representatives given that it is a much more prominent post. The gubernatorial term limit may cause governors to adopt an aggressive policy agenda so that they will build a favorable reputation when they leave office. This would be especially important for governors that are term limited because they will inevitably have to find a career

24 Unfortunately, there is a dearth of literature on state bicameralism. At the state level, chamber differences are much less understood than those of the US Congress, and a great deal less developed theoretically. Because of this gap, possible reasons for the house-senate disparity observed here (post term limit) is speculative at best. This present study brings us closer to acknowledging that state house and state senate differences are substantive while the mechanisms behind these differences remain tenuous.

in the private sector, a reality they are aware of on day one.[25]

Our empirical finding that gubernatorial term limits are associated with higher levels of spending is perhaps the most reliable finding given that governor term limits are built into state constitutions (or adopted shortly thereafter). In other words, gubernatorial term limits are as exogenous as statehood; that is, the reasons that some states have gubernatorial term limits while some do not has absolutely nothing to do with state spending. With respect to the adoption of *legislative* term limits, we still face an endogeneity question which should caution the inferences drawn these other term limit variables.[26]

Lastly, and not surprisingly, these results indicate that state governments operate under the "economies of scale" principle whereby population growth increases the efficiency of expenditures. Interestingly enough, increasing population density *increases* spending while increasing overall population decreases spending. Taken together, these results probably indicate that there exists an optimal economy of scale whereby population and area are proportional to the public goods that the state chooses to invest in. Although the population variable was not central to this analysis, it is an important improvement to the original model of Erler (2007).

This study underscores the price that political science can pay when work goes unchecked or non-replicated. In this case, I found no bases for the central finding in the original paper presented by Erler (2007). Legislative term limits do not significantly increase (or decrease) state expenditures on average, except when the concept is broken out and applied to each chamber of the state legislature independently. Therefore, the effects of term limitation are highly dependent on the government institution that they are imposed upon. From a policy perspective, these results raise questions about the ability of term limits to control spending at the state level given the competing theories of legislator motivation provided here.

25 Of course some governors are already wealthy when they assume office, are retired, or plan on serving in another public office. These probably are the exceptions to governors who must look for work after leaving the governor's mansion.

26 Future research would do well to find instruments that predict the adoption of term limits but are unrelated to spending.

REFERENCES

Alt, James E. and Robert C. Lowry. "Divided Government, Fiscal Institutions, and Budget Deficits: Evidence from the States." *American Political Science Review* 88. 4 (1994): 811–28.

Bandow, Doug. "Real Term Limits: Now more than Ever." Cato Institute's *Policy Analysis* 221 (1995).

Besley, Timothy and Anne Case. "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits." *Quarterly Journal of Economics* 110.3 (1995): 769–98.

Carey, John M.; Richard G. Niemi; Lynda W. Powell and Gary F. Moncrief. "The Effects of Term Limits on State Legislatures: A New Survey of the 50 States." *Legislative Studies Quarterly* 31.1 (2006): 105–34.

Erler, Abbie E. "Legislative Term Limits and State Spending." *Public Choice* 133 (2007): 479–94.

Fenno, Richard F. *Home Style: House Members in their Districts*. New York: Pearson Longman, 1978.

King, Gary. "Replication, Replication." *Political Science and Politics* 28.3 (1995): 444–52.

Lopez, Edward J. "Term Limits: Causes and Consequences." *Public Choice* 114 (2003): 1-56.

Reed, Robert W. "Democrats, Republicans, and Taxes: Evidence that Political Parties Matter." *Journal of Public Economics* 90 (2006): 725–50.

Reed, Robert W.; Eric D. Schansberg; James Wilbanks and Zhen Zhu. "The Relationship between Congressional Spending and Tenure with an Application to Term Limits." *Public Choice* 94 (1998): 85–104.

Rogers, Diane Lim and John H. Rogers. "Political Competition and State Government Size: Do Tighter Elections Produce Looser Budgets?" *Public Choice* 105 (2000): 1–21.

Stigler, George J. "The Economies of Scale." *Journal of Law and Economics* 1(1958): 54–71.

Will, George F. *Restoration: Congress, Term Limits, and the Recovery of Deliberative Democracy*. New York: Free Press, 1992.

Zax, Jeffrey S. "Initiatives and Government Expenditures." *Public Choice* 63 (1989): 267–77.

Appendix

Table 4, Summary Statistics

Variable	Author	Mean	St. Dev	Min	Max
Unified Gov't (=1)	Erler Klepetar	.46 .44	.499 .49	0 0	1 1
Expend. per Capita	Erler Klepetar	2784 2049	707.6 970.8	1016 507	5220 5229
Gov. Party (Dem=1)	Erler Klepetar	.547 .537	.498 .494	0 0	1 1
Gov. Limits (=1)	Erler Klepetar	.274 .723	.446 .448	0 0	1 1
Income[2]	Erler Klepetar	6.09×10^{8} 2.64×10^{22}	2.30×10^{8} 9.07×10^{22}	2.31×10^{8} 9.17×10^{18}	1.82×10^{9} 1.29×10^{24}
Density[2]	Erler Klepetar	84057 85290	2117724 221517	2.57 18.09	1272479 1310453
Term Limits (=1)	Erler Klepetar	.053 .029	.224 .167	0 0	1 1
Unemployment Rate[2]	Erler Klepetar	41.1 41.1	30.8 30.9	4.84 4.84	324 324

Are Cigarette Excise Taxes Effective in Reducing the Habit?

The Impact of Income versus Price on the Percentage of Adults Who Smoke

Michael Palinkas

ABSTRACT

Existing research has shown that increasing cigarette taxes, and thus increasing the price of cigarettes per pack, has had a decreasing effect on the percent of adults who smoke, but only to a certain degree. Increasing the total price per pack of cigarettes and utilizing the tax revenue to fund anti-tobacco programs has been the mission of policymakers in all 50 states and the District of Columbia since 1988. These methods may no longer be efficient, as evidenced by the fact that many individuals still choose to smoke. This study sought to find any additional factors that may affect the percentage of adults who smoke.

The study looked at the effects of four variables on the percent of the adults who smoke: cigarette tax per pack, cigarette price per pack, median income, and the number of smoking-related deaths in 2005. The unit of analysis is the state, which also includes the District of Columbia for the purpose of this study. The data for this study were drawn from data produced by the U.S. Census Bureau and the Centers for Disease Control & Prevention for the year 2005.

Findings indicated that neither the tax per pack of cigarettes nor the price per pack has a statistically significant association with the percentage of adults who smoke. The number of deaths attributed per year to smoking also failed to affect the percentage of adults who smoke. In our statistical tests, median income was the only variable to have a significant association with the percentage of adults who smoke. Using a multivariate regression model, a $10,000 increase in median income is associated with an average decrease of 2 percent in the percentage of adults who smoke, while all other variables remain constant.[1]

Since total price per pack of cigarettes has been shown to have no statistically significant effect on the percentage of adults who smoke, additional research is necessary in order to better understand the ways that smokers have altered their behavior due to higher prices. Further research is also necessary in order to comprehend the income disparity that exists between low- and high-income smokers, especially in regards to their ability to receive and their exposure to anti-tobacco programs and cessation advice from health care providers.

1 $\hat{y}_i = 30.76 + 0.043X_{1i} - 0.319X_{2i} - 0.0002X_{3i} - 0.000019X_{4i} + e_i$

INTRODUCTION

In the United States alone, an estimated 443,000 deaths per year are attributed to smoking cigarettes.[2] In an effort to reduce the number of these preventable deaths, state governments have created legislation and programs that seek to decrease the number of smokers, and in turn decrease the number of deaths caused by smoking. Their actions have not been entirely successful.

Since the late 1980s, states have increased the excise tax on cigarettes in order to deter individuals from purchasing cigarettes, with the hope that an increase in the total price per pack of cigarettes will decrease the number of smokers.[3] The simple fact that people continue to smoke requires an in-depth look at the use of taxes as a deterrent. Factors aside from the price must be responsible for the continued existence of cigarette smoking.

This study will look at four factors in relationship to the percentage of adults who smoke. Two factors will consider price – tax per pack of cigarettes and cost per pack of cigarettes – while two factors will consider an individual's environment – median income and smoking related deaths per year. This article is divided into five sections. In the first section, I will take a closer look at existing research. In an effort to determine the effectiveness of cigarette taxes to deter smoking, I will see how smoking behavior has changed since the late 1980s, when cigarette taxes were first used as a policy tool to decrease smoking. I will also examine how the revenue from cigarette taxes has been used for anti-smoking and cessation programs, and to what effect. In addition, I will analyze the disparity of income between different groups of smokers and how this factor contributes to the overall epidemic of smoking. This leads me to question possible options to deter smoking, if price is not an effective deterrent.

Next, I will look at four hypotheses to determine if an increase in the total cost of cigarettes empirically works to decrease the percentage of adults who smoke. These four tests will focus on cigarette tax, cigarette price, median income, and smoking-related deaths per year in an effort to offer alternative policy proposals in place of simply increasing the price of cigarettes.

The final sections will then address the methods of the study and highlight my analysis. In the third section, I will look at the data that were used to conduct this study and any relevant issues that they present in regards to the accuracy of my research and conclusions. The fourth section will present information concerning the specific variables that were examined for the study and how they should be interpreted throughout the analysis. Finally, the fifth section will showcase the statistical analysis and the findings that we can conclude from running a multivariate regression equation. This equation will help us determine the relationship between our independent variables (cigarette tax, cigarette price, median income, and smoking related deaths) and our dependent variable (percent of adults who smoke). Based on the equation, I will offer conclusions and additional comments in regards to future research and

2 Centers for Disease Control and Prevention, "Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses: United States, 2000-2004," *Morbidity and Mortality Weekly Report 57*(45): 1226.
3 Howard K. Koh, "An Analysis of the Successful 1992 Massachusetts Tobacco Tax Initiative," *Tobacco Control 5*(3): 220.

possible policy options that may work in conjunction with cigarette taxes to decrease the percentage of adults who smoke. Cigarette taxes have been utilized as a tool to decrease cigarette smoking for over twenty years. Surely, additional factors must be at work that cause individuals to continue smoking. As a result of this research, alternative options can be proposed which would allow states to effectively control the percentage of adults who smoke and therefore decrease the number of preventable deaths that occur in the United States each year.

SECTION I: Existing Research

The existing research regarding the effects of cigarettes taxes on cigarette consumption is both deep and wide. A brief summary of the history of cigarette taxes and the ever-increasing price of cigarettes is in order, as well as a look at the research that has been conducted concerning the effects of increased cigarette prices on lower-income smokers.

The first state-levied cigarette tax was implemented by California in 1988.[4] In just the first year, a $0.25 per pack increase in the cigarette tax generated $750 million in revenue, 20 percent of which was funneled towards tobacco control programs in an effort to thwart would-be smokers from picking up the habit.[5] After 15 years, the new tax generated $1.8 billion towards tobacco control programs and contributed to an estimated $86 billion in savings on "personal health-care expenditures."[6]

Following California's lead, Massachusetts passed a similar piece of legislation in 1992, which increased the state cigarette tax and designated a percentage of the revenue to go toward new tobacco control programs. The law was enacted in 1993, and in only one year, consumption decreased by 17 percent.[7] This finding collaborates well with the Center for Disease Control's (CDC) assessment that "additional increases in cigarette excise taxes, and dedication of all resulting revenues to tobacco control and prevention programs … could result in further reductions in smoking."[8]

The CDC has been a strong proponent of increasing the cost of cigarettes, and specifically, increasing the tax per pack of cigarettes in order to decrease the rate of consumption. In 2009, the CDC found that a 10 percent increase in the price of cigarettes can reduce consumption by up to 4 percent among adult smokers.[9] The CDC, along with the World Health Organization and the World Bank, adamantly support the perpetual increase of cigarette taxes both to reduce cigarette consumption and to continue supporting tobacco control programs that will help further diminish the use of cigarettes and thus, the number of deaths attributed to smoking.[10]

4 Ibid.
5 Ibid.
6 Center for Disease Control and Prevention (CDC), "State Cigarette Excise Taxes: United States, 2009," *Morbidity and Mortality Weekly Report 59*(13): 388.
7 Koh, "An Analysis of the Successful 1992 Massachusetts Tobacco Tax Initiative," 224.
8 CDC, "State Cigarette Excise Taxes," 385.
9 Ibid., 386.
10 Mohammad Siahpush et al., "Taxation Reduces Social Disparities in Adult Smoking Prevalence," *American Journal of Preventive Medicine 36*(4): 285.

In 2007, the Institute of Medicine (IOM) found that recent cigarette tax increases have been motivated in large part by state budget shortfalls.[11] Currently, 44 states and the District of Columbia levy a point-of-sale tax on top of state and federal cigarette taxes. In addition, the CDC reported that 460 localities impose an *additional* point-of-sale tax on cigarettes. With an aim to reduce the smoking rate to 10 percent by 2025, the IOM and CDC continue to support excise tax increases even though alternative research suggests that higher taxes will only work to a certain degree, especially among low-income smokers.[12-13]

The negative effects of cigarette taxes can be analyzed in conjunction with income. Siahpush, et al., found that an increase in taxes does not show an "effect of price on smoking or a difference in price responsiveness across socioeconomic groups."[14] Increased prices are financially viable for high-income smokers to accommodate, but low-income smokers are impacted more severely. In fact, studies have shown that smokers overall, but especially low-income smokers, are "relatively insensitive" to the price of cigarettes, which only suggests that low-income smokers are left with a "particular burden" if they continue to smoke following an increase in cigarette taxes or an increase in price per pack.[15] In addition, the decline in cigarette smoking over the past half century has been "more marked in higher- than in lower-income persons."[16] This research shows that the increase in price resulting from excise taxes should presumably affect high- and low-income populations uniformly. In fact, and more specifically, neither group should change smoking rates due to the inelasticity of demand.

Additional studies suggest that the behavior of smokers has changed in response to an increase in the price per pack of cigarettes. Adda, et al., found that smokers "compensate" for an increase in excise tax by "smoking a given cigarette more intensely."[17] Adda concluded that a 1 percent increase in excise tax led to a 0.4 percent increase in smoking intensity.[18]

Smokers have also altered their purchasing behavior in reaction to the increase in cigarette prices over the past few decades. Franks, et al., estimate that a low-income household that consumes two packs of cigarettes per day spends roughly 25 percent of its income on cigarettes.[19] Thus, it is no surprise that low-income smokers have begun to switch from brand-name products to generic, off-brand cigarettes. In search of lower cigarette prices, smokers have altered their purchasing behavior by traveling to adjacent states where prices are substantially lower, purchasing cigarettes at Indian reservations (on which they are tax-free), ordering cigarettes over the Internet, and buying cigarettes illegally on the "black market."[20]

11 CDC, "State Cigarette Excise Taxes," 387.
12 Ibid., 388. In April 2009, the federal cigarette tax was increased 259%. ($0.39 per pack to $1.01 per pack).
13 Peter Franks et al., "Cigarette Prices, Smoking, and the Poor: Implications of Recent Trends," *American Journal of Public Health 97*(10): 1873.
14 Siahpush et al., "Taxation Reduces Social Disparities," 285.
15 Franks et al., "Cigarette Prices," 1873.
16 Ibid., 1873.
17 Jerome Adda and Francesca Cornaglia, "Taxes, Cigarette Consumption, and Smoking Intensity," *The American Economic Review 96*(4): 1013.
18 Ibid., 1014. Smoking intensity is measured by the deepness of each inhale and the total amount of an individual cigarette that was smoked.
19 Franks et al., "Cigarette Prices," 1876.
20 Ibid.

Lee noted similar trends in Taiwan, where smokers have responded to increased prices by purchasing generic brands and smuggling cigarettes.[21] Adda, et al., pointed out that some smokers compensate for price increases by purchasing cigarettes with higher levels of tar and nicotine in an effort to get more for their money.[22] Lee goes on to recommend that governments should consider replacing cigarette quantity with actual nicotine content as the basis for future excise taxes.

In his research, Brown found that the elasticity of cigarette consumption is -0.5, suggesting that cigarettes are price inelastic.[23] Frank, et al., adds to this by suggesting that a "declining sensitively" to the price of cigarettes may reflect an "out-growth of the overall decline in smoking" and that any "remaining smokers are likely to be selectively more addicted … than smokers from earlier time periods."[24] He concludes with the fact that since price has increased as demand for cigarettes has decreased, remaining smokers must be both "price insensitive" and disproportionately low-income individuals.[25] In addition, Houston, et al., found that the overall smoking rate did not decline during the 1990s, when cigarette taxes were first put into place throughout the country. He suggests that some Southern states even saw an increase in smoking.[26]

Gilman, et al., builds on this assessment by suggesting that in order to further reduce cigarette consumption, the socioeconomic gap inherent in smoking must be addressed.[27] Gilman, et al., found that the lower an individual's socioeconomic status, the more likely they are to try their first cigarette.[28] A low socioeconomic status also leads to an increase in the risk of "progression to regular use … and [a] decreased likelihood of cessation," while each additional year of adult education is related to a higher chance of quitting.[29] Gilman, et al., argues that the "socioeconomic status gradient – that is, the increasing prevalence of smoking with a decrease in socioeconomic status … has persisted for several decades" and continues to grow.[30]

Auld discovered that regular (daily) smoking is associated with an 8 percent lower income as compared to an individual that does not smoke.[31] Siahpush, et al., found that within the U.S., the social gradient in mortality among men would decrease by half if the differences that relate to smoking were eliminated.[32] The Whitehall I Study, which began in 1967 and

21 Jie-Min Lee, "Effect of a Large Increase in Cigarette Tax on Cigarette Consumption: An Empirical Analysis of Cross-Sectional Survey Data," *Public Health 122*(2008): 1066.
22 Adda, "Taxes, Cigarette Consumption," 1013.
23 A. Blake Brown, "Cigarette Taxes and Smoking Restrictions: Impacts and Policy Implications," *American Journal of Agricultural Economics 77*(4): 947.
24 Franks et al., "Cigarette Prices," 1876.
25 Ibid.
26 Thomas K. Houston et al., "Patient Smoking Cessation Advice by Health Care Providers: The Role of Ethnicity, Socioeconomic Status, and Health," *American Journal of Public Health 95*(6): 1056.
27 S. E. Gilman, D. B. Abrams, and S. L. Buka, "Socioeconomic Status over the Life Course and Stages of Cigarette Use: Initiation, Regular Use, and Cessation," *Journal of Epidemiology and Community Health 57*(10): 802.
28 Ibid., 803.
29 Ibid., 804.
30 Ibid., 802.
31 M. Christopher Auld, "Smoking, Drinking, and Income," *The Journal of Human Resources 40*(2): 515.
32 Siahpush et al., "Taxation Reduces Social Disparities," 285.

continued for several years, found that "low job status" was related to chronic lung disease and that those in "lower [job] grades … were indeed more likely [to smoke]."[33] At the opposite end of the spectrum, Houston, et al., found that a higher education is associated with a higher report of smoking cessation advice by health care providers.[34] These studies indicate that there seems to be a negative relationship between income levels and regular smoking habits and a positive relationship between income and cessation practices.

As we have seen, increasing the price of cigarettes by way of imposing taxes has ceased to be an effective measure to decrease smoking. The remainder of this study will look at both the costs associated with smoking and how they affect the percentage of adults who smoke. I will also examine environmental factors that may allow us to build a clearer picture about appropriate disincentives to smoking.

SECTION II: Hypotheses

A theoretical regression model was used to test the effects of four different variables and their combined contribution to the percent of adults who smoke. Each of the four tests is based on the following equation:

$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \varepsilon_i$ *Where*

Y_i = Percentage of adults who smoke

X_{1i} = Cigarette tax ($/pack)

X_{2i} = Price per pack of cigarettes ($)

X_{3i} = Median income ($)

X_{4i} = Deaths attributed to smoking in 2005

Hypothesis Test #1: Cigarette Tax

H_1:
There is a relationship between the amount of tax per pack of cigarettes and the percentage of adults who smoke.

Hypothesis #1 will look at the effect that cigarette taxes have on the percentage of adults who smoke. Federal, state, and local governments have worked to increase the amount of tax per pack of cigarettes in order to dissuade individuals from smoking. As we have seen above, past research show has shown the effectiveness of such legislation to be mixed. Thus, it will be important for us to understand the actual effect that cigarette taxes have in regards to the percentage of adults who smoke in order to measure whether or not the policy of increasing

33 Richard Wilkinson and Kate Pickett, *The Spirit Level: Why Greater Equality Makes Societies Stronger* (New York: Bloomsbury Press, 2009), 75.

34 Houston et al., "Patient Smoking Cessation Advice," 1057.

cigarette taxes is actually the most effective method to decrease the percentage of adults who smoke.

Hypothesis Test #2: Cigarette Prices

H_2:
There is a relationship between the price of cigarettes per pack and the percentage of adults who smoke.

Hypothesis test #2 will measure the effect that the price of cigarettes per pack has on the percentage of adults who smoke. Much like cigarette taxes, federal, state, and local governments have determined that increasing the cost of cigarettes will decrease the number of individuals who choose to smoke. To determine whether a policy of increasing cigarette prices should be implemented, it will be important to know whether this is actually effective in deterring smoking.

Hypothesis Test #3: Median Income

H_3:
There is a relationship between median income and the percentage of adults who smoke.

Hypothesis test #3 will analyze the effect of median income in relation to the percentage of adults who smoke. The relationship between median income and smoking is an important aspect to investigate so that anti-smoking and smoking cessation programs can be targeted to the appropriate income groups. In addition, this test will allow us to note any type of inequality between income groups in regards to smoking. If such a relationship is evident, policymakers can use this information to better target smokers and to create legislation that will focus more on users' immediate environment as an additional effort to dissuade individuals from smoking.

Hypothesis Test #4: Smoking-Related Deaths

H_4:
There is a relationship between the number of deaths per year attributed to smoking and the percentage of adults who smoke.

Hypothesis test #4 will allow us to measure the effect of smoking-related deaths on the percentage of adults who smoke. Anti-smoking campaigns often stress the dangers of smoking. This test will look at the implied effectiveness of such campaigns. Public education related to the long term effects of smoking is crucial in order to prevent individuals from commencing a habit of smoking. In addition, public education is especially important because of the apparent relationship between socioeconomic groups and the diseases associated with smoking, as we have seen in the existing research.[35] Policymakers should take a close look at

35 Wilkinson and Pickett, *The Spirit Level*, 75.

the message that is crafted by anti-smoking programs in order to dissuade individuals from smoking. A thorough study of the success of such efforts is necessary so that policymakers can gain a better understanding of how well anti-smoking programs work and how efficient they are at instilling the message that smoking is a dangerous habit.

SECTION III: Data

The data that have been used for this study were collected in 2005 and include information on population characteristics and smoking habits for each of the 50 states and the District of Columbia. The unit of analysis of the data is the state, which includes the District of Columbia, for the purposes of this study. Each variable used for this study has 51 observations and zero missing values.

Possible methodological issues regarding the data set include: underreporting of smoking habits due to social stigma and privacy concerns; underreporting of smoking related deaths due to attribution to supplementary causes of death; bias while collecting the information due to both the method and medium of accumulating data; and market fluctuation related to the price of cigarettes per pack during the span of time that the data was collected.

SECTION IV: Variables

This section will present detailed information in regards to each of the five variables that were considered and analyzed throughout the project. First, I will look at the dependent variable, the percentage of adults who smoke. Then I will discuss each independent variable and analyze its characteristics. The independent variables include cigarette tax, cigarette price, median income, and annual number of smoking-related deaths.

Variable	Mean	S.D.	Min.	Max.
% of adults who smoke	21.57	3.11	10.5	27.6
Cigarette tax ($/pack)	0.92	0.60	0.07	2.46
Cigarette price ($/pack)	3.87	0.69	3.01	5.62
Median income ($)	45,754.76	7,271.55	33,090	61,694

Table 1: *Descriptive Statistics of Interval-Ratio Variables*

Percentage of Adults Who Smoke

In this dataset, the variable is measured by dividing the total number of adult smokers in a given state into the total number of adults in that state. This variable is interval-ratio measurement and, as we can see in Table 1, an average of 21.57 percent of adults in all U.S. states were smokers as of 2005. Utah has the lowest percent of adult smokers with 10.5 percent, while Kentucky has the highest percentage, at 27.6.

The objective of this study is to analyze the impact of other variables on the percentage of adults who smoke. Increasing the total price per pack of cigarettes

(price per pack + tax per pack) in order to decrease the number of adults who smoke has been a policy objective for several years. Let us examine how the lowest state (Utah) and the highest state (Kentucky) compare in regard to price. In Utah, the average total price per pack of cigarettes is $4.46, while in Kentucky the average total price per pack is $3.31. The difference between the state with the smallest proportion of smokers and the largest is $1.15, on average.

Cigarette Tax

The next variable that was taken into consideration is cigarette tax. In the dataset, cigarette tax is an interval-ratio variable that represents the dollar amount of tax per pack of cigarettes. As Table 1 shows, the average cigarette tax in the United States is $0.92 per pack. The state with the lowest cigarette tax is South Carolina ($0.07) and the state with the highest cigarette tax is Rhode Island ($2.46).

Cigarette Price

Another important variable that was used to predict the percentage of adults who smoke is the price of cigarettes per pack. In the dataset, this variable is measured in dollars per pack. Cigarette price is an interval-ratio variable, and as Table 1 shows, the average pack of cigarettes in the United States costs $3.87. In Kentucky, a pack of cigarettes, pre-tax, costs $3.01, which is the lowest in the country. The highest price per pack of cigarettes is in New Jersey, where one pre-tax pack costs $5.62.

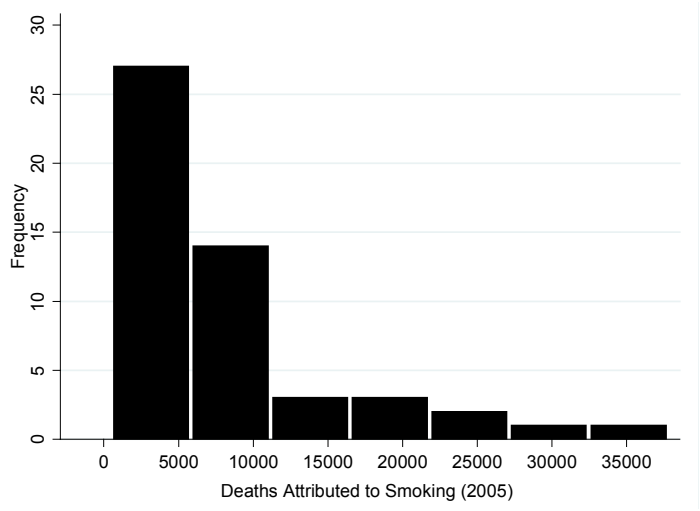
Median Income

The third variable used to determine the percentage of adults who smoke is that of median income, which is measured in dollars and is also an interval-ratio variable. In Table 1, we see that the average median income in the United States is $45,754.76. The lowest median income per state is $33,090 (Mississippi) and the highest is $61,694 (New Jersey).

Smoking-Related Deaths

The final variable that I analyzed in relation to the percentage of adults who smoke is deaths attributed to smoking. This variable is ordinal, and its distribution can be seen in Figure 1. Over 50 percent of states had fewer than 6,000 deaths attributed to smoking in 2005. Alaska had the fewest deaths attributed to smoking with 500, while California had the most with 37,800.

Figure 1: *Smoking Related Deaths in 2005*



SECTION V: Discussion (Analysis and Findings)

Now that I have prepared the basis for the hypotheses described above, I will take a closer look at each test and analyze the findings. I will use the following equation to test the variables:

$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \varepsilon_i$ *Where*

Y_i = Percent of adults who smoke

X_{1i} = Cigarette tax ($)

X_{2i} = Price per pack of cigarettes ($)

X_{3i} = Median income ($)

X_{4i} = Deaths attributed to smoking in 2005

Using the data set described above, I estimate this theoretical equation and generate the following regression equation:

$Y_i = 30.76 + 0.043X_{1i} - 0.319X_{2i} - 0.0002X_{3i} - 0.000019X_{4i}$

From this equation, I can determine that if cigarette tax is zero, price per pack of cigarettes is zero, median income is zero, and deaths attributed to smoking in 2005 is zero, an average of 30.76 percent of adults would smoke.

Table 2: *Multivariate Regression Results*

*Notes: * Statistical significance: $p < 0.05$ (two-tailed tests)*

Standard errors shown in brackets

Dependent variable: % adults who smoke	**Unstandardized Coefficients**
Cigarette tax ($/pack)	**0.043** **[1.401]**
Cigarette price ($/pack)	**-0.319** **[1.289]**
Median income ($)	**-0.0002*** **[0.00007]**
Smoking related deaths (2005)	**-0.000019** **[0.0000052]**
Constant	**30.76*** **[3.849]**
N **of Observations**	**51**
R^2	**0.2011**

Hypothesis Test #1: Cigarette Tax

H_1:

There is a relationship between the amount of tax per pack of cigarettes and the percent of adults who smoke.

Using a two-tailed t-test, an alpha level of 0.05 (95% confidence), 46 degrees of freedom, and a $t_{(critical)}$ of ±2.01, we find that the $t_{(obtained)}$ is 0.031. Therefore, we cannot reject the null hypothesis. There is not a statistically significant relationship between the amount of tax per pack of cigarettes and the percentage of adults who smoke, while holding all other variables constant. Figure 2 demonstrates this lack of association more clearly.

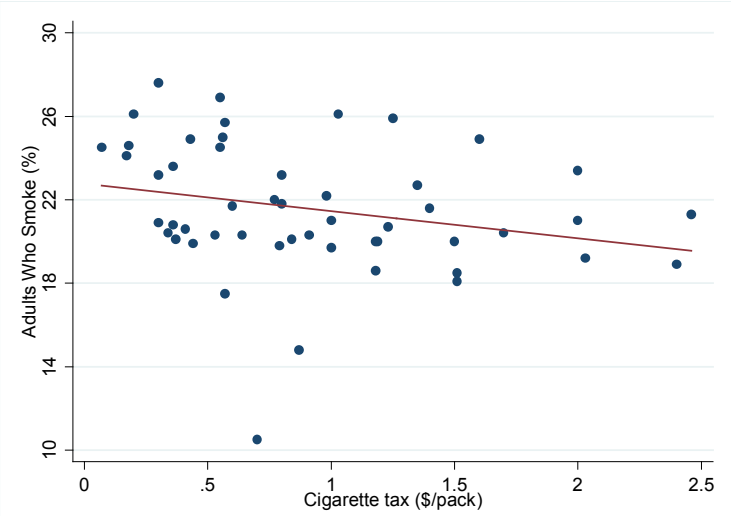


Figure 2: *Cigarette taxes ($/pack) have no relationship to the percentage of adults who smoke.*

This finding suggests that the CDC, WHO, and World Bank may be incorrect in as far as their assessment that cigarette taxes have an affect on the percentage of adults who smoke, while holding cigarette prices, median income, and smoking related deaths constant. Franks, et al., and Lee may be correct in that taxes are not an appropriate policy solution to decrease smoking. As Frank, et al., suggests, smokers have become price insensitive and as Brown shows, cigarettes are price inelastic. [36] [37]

Hypothesis Test #2: Cigarette Prices

H_2:
There is a relationship between the price of cigarettes per pack and the percent of adults who smoke.

Using a two-tailed t-test, an alpha level of 0.05 (95% confidence), 46 degrees of freedom, and a $t_{(critical)}$ of ±2.01, we find that the $t_{(obtained)}$ is -0.247. Therefore, we cannot reject the null hypothesis. There is not a statistically significant relationship between the price of cigarettes per pack and the percentage of adults who smoke, while holding all other variables constant. Figure 3 illustrates this lack of association.

36 Franks et al., "Cigarette Prices," 1876.
37 Brown, "Cigarette Taxes," 947.

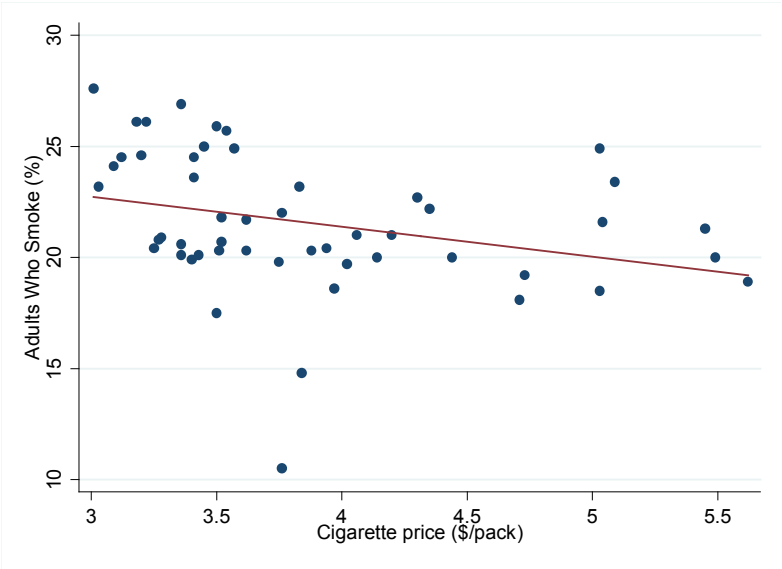


Figure 3: *Cigarette prices ($/pack) have no relationship to the percent of adults who smoke.*

Much like cigarette taxes per pack, increasing cigarette prices themselves does not appear to significantly decrease the percentage of adults who smoke. Again, Frank, et al., and Lee were correct in their assessment that the cost of cigarettes may no longer be a deterrent.[38] [39] If price does not affect the percentage of adults who smoke in a statistically significant way, it is important to determine what may have more favorable effects.

Hypothesis Test #3: Median Income

H_3:
There is a relationship between median income and the percent of adults who smoke.

Using a two-tailed t-test, an alpha level of 0.05 (95% confidence), 46 degrees of freedom, and a $t_{(critical)}$ of ±2.01, we find that the $t_{(obtained)}$ is -2.857. Therefore, we can reject the null hypothesis. There is a statistically significant relationship between median income and the percentage of adults who smoke, while holding all other variables constant. A $10,000 increase in median income is associated with an average decrease of 2 percentage points in adults who smoke, holding all other variables constant. Figure 4 allows us to see this apparently negative association more clearly. As the existing research suggested, the higher an individual's income, the less likely he or she will smoke cigarettes, on average. [40] [41]

38 Franks et al., "Cigarette Prices," 1876.
39 Brown, "Cigarette Taxes," 947.
40 Auld, "Smoking, Drinking, and Income," 515.
41 Wilkinson and Pickett, The Spirit Level, 75.

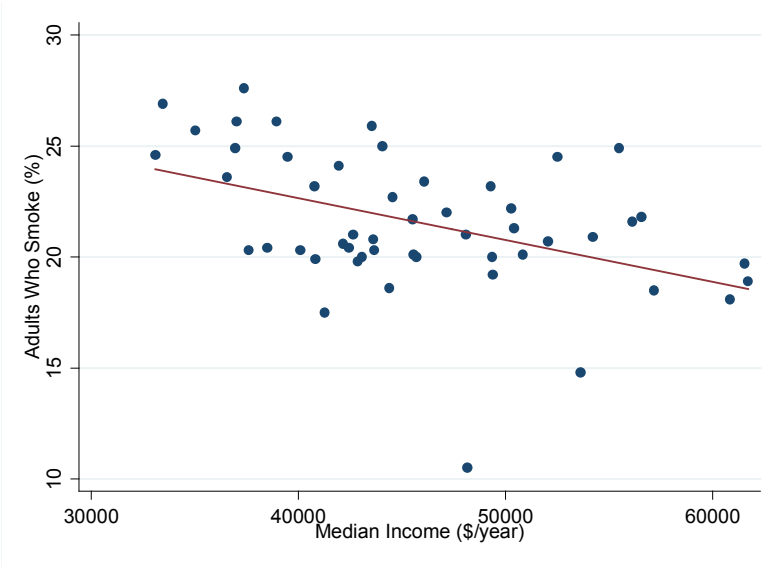


Figure 4: *Median income ($/year) has a negative relationship with the percentage of adults who smoke.*

Hypothesis Test #4: Smoking-Related Deaths

H_4:
There is a relationship between the number of deaths per year attributed to smoking and the percentage of adults who smoke.

Using a two-tailed t-test, an alpha level of 0.05 (95% confidence), 46 degrees of freedom, and a $t_{(critical)}$ of ±2.01, we find that the $t_{(obtained)}$ is -0.365. Therefore, we cannot reject the null hypothesis. There is not a statistically significant relationship between the number of deaths per year attributed to smoking and the percentage of adults who smoke, while holding all other variables constant. Figure 5 allows us to see this lack of an association more clearly.

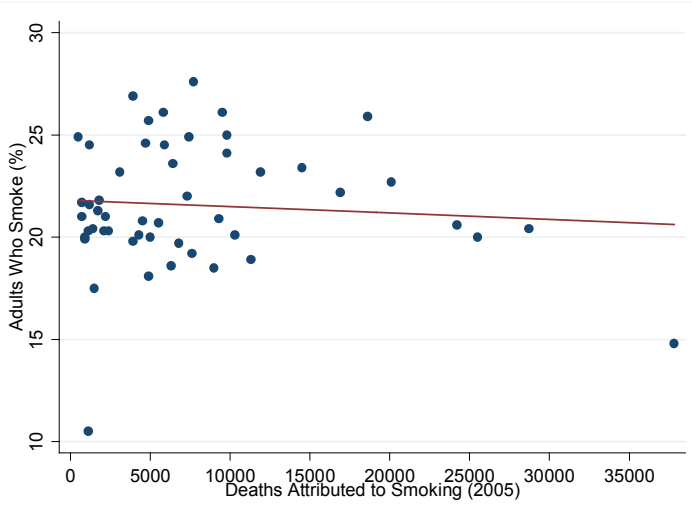


Figure 5: *Deaths attributed to smoking has no relationship to the percentage of adults who smoke*

Much like existing research has suggested, public education efforts have failed to motivate cessation of cigarette smoking. We can see this by the lack of association between the number of deaths attributed to smoking and the percentage of adults who smoke. Associations have been found between higher education and an increase in cessation advice from health care providers. The disparity between smoking and income levels allows us to see that low-income smokers do not have the same resources available as high-income smokers in regards to anti-tobacco programs.[42-43] These findings suggest that low-income smokers are less aware of the long-term risks of smoking, and as Frank, et al., found, low-income smokers are also price insensitive, and we can now add, information insensitive.

CONCLUSIONS

As explained using the multivariate regression model, while holding all other variables constant, median income is the only factor found to be associated with a decrease in the percentage of adults who smoke. I found that a $10,000 increase in median income is associated with an average decrease of 2 percentage points in the number adults who smoke. The total cost of cigarettes (tax and price per pack) did not significantly decrease the percent of adults who smoke, nor did the fact that hundreds of thousands of people die each year from smoking-related diseases.

With the combined knowledge of the effects of total cigarette price and median income on the percentage of adults who smoke, it seems that policymakers who seek to decrease the number of people who smoke should direct their efforts towards decreasing the inequality of income in order to decrease smoking. As Frank pointed out, smokers now seem to be price

42 Houston et al., "Patient Smoking Cessation Advice," 1057.
43 Wilkinson and Pickett, *The Spirit Level*, 75.

insensitive,[44] thus, future anti-smoking policy proposals need to be focused on income rather than price. Although intuitively one might assume that the less money an individual makes, the less likely they will spend money on a habit such as cigarette smoking, but our data suggests otherwise. Low-income individuals are associated with a higher rate of smoking. The possibility exists that public education regarding cigarette smoking is lacking, which would work to explain the income disparity (assuming that the more income one earns, the more educated they are).

For the past twenty years, policymakers have been relying on public awareness campaigns that are funded in large part by utilizing cigarette excise tax revenues that are designed to decrease the prevalence of smoking. However, instead of stopping smoking, smokers have reacted by altering the way that they purchase and use cigarettes. Existing research suggests that smokers are now price insensitive. Thus, additional methods to curb the use of cigarettes must be adopted.

We can discern from our findings that policymakers may want to focus on decreasing the income disparity *in tandem* with the use of anti-tobacco programs in order to halt the use of cigarettes. Some policy implications may be to stop increasing cigarette taxes for a certain period of time because, as we have found, excise taxes on cigarettes disproportionately affect low-income smokers. New policies may want to address the number of cigarettes per pack in order to alleviate the increase in smoker intensity and the desire for higher tar and nicotine yields. Policymakers could also consider creating new regulations regarding the ingredients in cigarettes, which may help alleviate their habit-forming tendencies.[45] As the existing research suggests, cigarettes are more addictive than in the past, which may work to explain the "out-growth" of trends in smoking. People who currently smoke may be destined to smoke, some suggest.[46] Decreasing the number of cigarettes per pack from twenty to five or ten, while maintaining the current price and tax levels, may create such a disincentive to smoke that even those who are currently price insensitive will be forced to quit. Lower nicotine and tar yields in conjunction with smaller packs that remain at current pack prices may be a more effective deterrent than raising prices or imposing taxes. Another possible alternative, as Lee suggested, is to tax cigarettes based on nicotine and tar yield, rather than quantity. Further research in this area is necessary to measure the possible reactions from smokers regarding these new policies. One thing this study can conclude is that simply increasing the total cost of cigarettes is no longer effective as a deterrent to smoking.

As with any research project, methodological issues may limit the conclusions that we can draw from our study. Underreporting of cigarette smoking in the original survey would significantly alter our findings. Overreporting income would also cause our conclusions to be in error. In addition, if more smokers are crossing state lines and purchasing cigarettes at lower-than-retail rates, our research would become rather questionable. It is possible that high-income smokers are savvier and more willing to travel to purchase cigarettes at lower prices. In regard to the number of deaths attributed to cigarettes, each state may have a differ-

44 Franks, "Cigarette Prices," 1876.
45 Lee, "Effect of a Large Increase," 1066.
46 Franks et al., "Cigarette Prices," 1876.

ent definition of a "smoking-related" cause of death, allowing the data for this variable to be quite skewed. In addition, misreporting the amount of cigarette tax in a given state and the price per pack of cigarettes may be in error, which would severely alter our findings.

New research is needed in this field. As mentioned above, studies should be conducted in order to measure the effect of nicotine- and tar-based taxes rather than quantity-based taxes. Researchers should conduct studies regarding the change in cigarette purchasing behavior in order to obtain better information regarding how many smokers travel elsewhere or use the Internet to buy cigarettes. Tests should be run to see if smaller packs at constant prices would affect smoking behavior. Additional research in the area of "smoker intensity" would also help us learn how smokers have adjusted their habits in the face of increased prices and taxes. Further research should be performed in order to accurately measure the effects of income inequality on smoking behavior.

Even as smoking decreased rapidly over the past fifty years, users remain. This study has shown that an increase in price and tax has ceased to be an effective tobacco-control policy, nor is public education in regards to the risks of smoking effective for low-income smokers. Further research and broad, wide-ranging policy options are necessary so that the addictive habit of smoking might be eradicated. Policymakers must focus on decreasing smoking rates in order to both save lives and allow current smokers to save significant amounts of money.[47] The CDC has set a goal of decreasing smoking rates to only 10 percent of the adult population by 2025.[48] With additional research, a debunking of long-held assumptions, and increasingly creative policy options, this goal may still be within reach.

47 Franks et al., "Cigarette Prices," 1876.
48 CDC, "State Cigarette Excise Taxes," 388.

Bibliography

Adda, Jerome and Francesca Cornaglia. "Taxes, Cigarette Consumption, and Smoking Intensity." *The American Economic Review 96*(4): 1013-1028.

Auld, M. Christopher. "Smoking, Drinking, and Income." *The Journal of Human Resources 40*(2): 505-518.

Brown, A. Blake. "Cigarette Taxes and Smoking Restrictions: Impacts and Policy Implications."

American Journal of Agricultural Economics 77(4): 946-951.

Center for Disease Control and Prevention (CDC). "Smoking-Attributable Mortality, Years of

Potential Life Lost, and Productivity Losses: United States, 2000-2004." *Morbidity and Mortality Weekly Report 57*(45): 1226-1228.

---. "State Cigarette Excise Taxes: United States, 2009." *Morbidity and Mortality Weekly*

Report 59(13): 385-388.

Franks, Peter, Anthony F. Jerant, J. Paul Leigh, Dennis Lee, Alan Chiem, Ilene Lewis, and Sandy Lee. "Cigarette Prices, Smoking, and the Poor: Implications of Recent Trends." *American Journal of Public Health 97*(10): 1873-1877.

Gilman, S. E., D. B. Abrams, and S. L. Buka. "Socioeconomic Status over the Life Course andStages of Cigarette Use: Initiation, Regular Use, and Cessation." *Journal of Epidemiology and Community Health 57*(10): 802-808.

Houston, Thomas K., Isabel C. Scarinci, Sharina D. Person, and Paul G. Greene. "Patient

Smoking Cessation Advice by Health Care Providers: The Role of Ethnicity, Socioeconomic Status, and Health." *American Journal of Public Health 95*(6): 1056-1061.

Koh, Howard K. "An Analysis of the Successful 1992 Massachusetts Tobacco Tax Initiative."

Tobacco Control 5(3): 220-225.

Lee, Jie-Min. "Effect of a Large Increase in Cigarette Tax on Cigarette Consumption: An Empirical Analysis of Cross-Sectional Survey Data." *Public Health 122*(2008): 1061-1067.

Siahpush, Mohammad, Melanie A. Wakefield, Matt J. Spittal, Sarah J. Durkin, and Michelle M.

Scollo. "Taxation Reduces Social Disparities in Adult Smoking Prevalence." *American Journal of Preventive Medicine 36*(4): 285-291.

Wilkinson, Richard, and Kate Pickett. *The Spirit Level: Why Greater Equality Makes Societies*

Stronger. New York: Bloomsbury Press, 2009.

Budget and Cost Analysis for the Proposed Rappahannock-Shenandoah-Warren Regional Jail

Matthew Reges

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Abstract

Rappahannock, Warren, and Shenandoah counties are rural localities in the northwestern part of Virginia. They have begun work on a regional jail to house criminal defendants and misdemeanor convicts. Each county currently has a county jail, all overcrowded and aging, and the small size of each precludes most rehabilitative programs for inmates. Many other rural counties, including many around these three, have partnered to create regional jail authorities to recognize economies of scale. Rappahannock, Warren, and Shenandoah have begun to do the same.

This budget and cost analysis finds that at 100% capacity in the FY 2015 year, the RSW Regional Jail can operate at an annual cost of $110.86 per inmate-day; at 120% capacity, operating costs fall to $102.79. These costs are considerably higher than what the three localities currently pay, and the regional jail may prove more expensive for the counties, even considering state aid. The jail will have excess capacity, and Northern Virginia suburbs will pay to unload their crowded jails, but the rural budgets may still feel significant strain compared to the status quo. However, the regional jail will be able to offer superior inmate programs, including GED classes, language classes, work release to local businesses, and gardening. Quantifying these benefits' value is difficult, so I cannot conclusively endorse the regional jail. Renovating and expanding the county jails may provide a better value and less risk.

The $68 million jail would be financed by a mix of state bonds and bonds issued by the regional jail authority. However, it is not clear whether state reimbursement would occur quickly enough to prevent the regional authority from having to issue bonds for the full price of the jail; if the state could pay promptly, the three counties would save some $13 million in interest over 30 years.

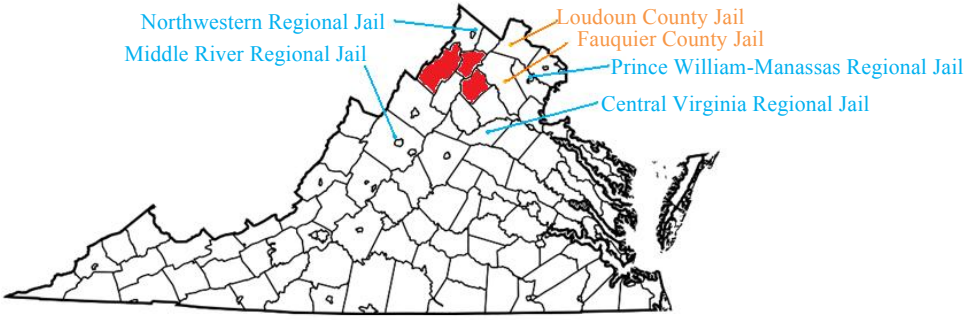
Operating jails involves a broad array of fixed and variable costs. Identifying these, gauging their behavior with respect to inmate load, and forecasting inflation over time is difficult when peer facilities use the simplest kind of line-item budget presentations. Flexible and program budgets should be created by existing regional jails to improve transparency and decision making.

Background

Virginia currently has 21 regional jails. These facilities provide smaller localities with economies of scale in detention and care of inmates. While the state Department of Corrections operates 37 correctional and work centers for convicted felons, jails house those convicted of lesser offenses and those awaiting trial for whom bail has not been posted. Throughout most of Virginia's history, each city and county maintained its own jail. These brick buildings downtown did not age well, conditions deteriorated, and paradigms of simple incarceration and efficiency partially gave way to new emphases on rehabilitation and ethical care. For many rural localities, regional jails concentrate expertise, reduce overhead, and enable compliance with current legal, technological, and ethical standards.[1]

The map below shows the service area of the proposed RSW Regional Jail and its nearby peers.

Figure 1: Map of RSW Regional Jail Service Area and Nearby Peer Facilities



At present, Shenandoah, Warren, and Rappahannock Counties each maintain a county jail in the county seat. While all three counties are rural and are located beyond the Washington, D.C. metro area, their populations are growing rapidly. Their county jail facilities represent the previous century's architecture, ethics, and demographics. The excerpt below, from the Corrections Department report that approved the RSW Regional Jail project, details existing conditions:

1 Robyn de Socio, *FY 2009 Jail Cost Report,* iv.

The Rappahannock County Jail, located in the Town of Washington, was built in the late 1830's, and renovated/expanded in 1991; a two story historic brick structure with a basement, and is located adjacent to the Rappahannock County Court complex. The facility has an operating capacity of 7 inmates; the ADP [average daily population] was 14, during the first six months of 2006, and the facility was operating at an average 195% of capacity in 2006.

Shenandoah County Jail is located on South Main Street in Woodstock, Virginia adjacent to the Circuit Court Building; a two story brick structure with a basement, the jail design is the old style "linear indirect supervision" model characterized by small cells placed in a back to back arrangement of rows; opened in 1969 with an expansion in 1991, the facility has an operating capacity of 55; an ADP of 84 was reported during the first six months of 2006, and the jail was operating at 153% of capacity in 2006.

Warren County Jail, located in the Town of Front Royal, was opened in 1950, expanded in 1989, and a work release center (separate from the main jail) opened in 2001; the jail has an operating capacity of 79, and the ADP was 157 in the first six months of 2006; the jail was operating at an average 199% of capacity in 2006.

All three facilities are in need of some major renovations and will be closed once the new facility is opened.[2]

Not only have the localities' populations increased, but the load on sheriff's offices is also changing, as globalization brings new kinds of crime to the Shenandoah Valley. The interstate highways that run through the area have in recent years become major avenues for the trafficking of drugs and weapons to urban markets along the eastern seaboard. Rural jails along these routes hold a small but significant and expensive number of prisoners for extradition or deportation. In 2005, Shenandoah and Warren Counties joined the federally-funded Northwest Regional Drug/Gang Task Force to curtail transient illicit activity, including MS-13 gang members and methamphetamine shipments.[3]

2 Virginia Department of Corrections. Annual Report of Board of Corrections: Approved Jail Projects, 15.
3 Daniel McEathron, Shenandoah County sheriff. "Memo Re. FY 2011 Gang Task Force Funding," 1.

Table 1: Comparing Jail Costs & Crowding *(source: de Socio, FY 2009 Jail Cost Report)*					
Jail Facility	Capacity	Load	% Capacity	Operating Cost per Inmate-Day	Year Built
Northwestern	556	549	99	$82.97	2007
Rappahannock	7	23	329	$91.64	1835, 1991
Shenandoah	55	96	175	$51.52	1969, 1971
Warren	79	107	136	$54.50	1950, 1989, 2001
Central Virginia	242	382	158	$53.01	1990, 2000
Middle River	396	594	150	$48.42	2006
Fauquier	56	114	203	$72.45	1966
Overall	1391	1865	134	-	-

Finally, neighboring jails lack the capacity to easily absorb the extra inmates from these three counties. The table above shows FY09 capacities and loads from the state Compensation Board Report. Most facilities which might receive the excess from Shenandoah, Warren, and Rappahannock Counties are over capacity, even though three of the four are less than 10 years old.

In sum, a new regional jail facility for Rappahannock, Shenandoah, and Warren Counties has the potential to reduce detention costs for those localities while simultaneously improving conditions for inmates and relieving some of the strain on neighboring jails.

Financing RSW Regional Jail

The proposed Rappahannock-Shenandoah-Warren Regional Jail would be financed by a mix of state and local debt obligations. The counties would prefer that the state government pay half of the construction costs. However, as currently budgeted, the greater part of construction costs fall on the localities.

On April 14, 2010, Governor McDonnell made ninety-six amendments to the biennial budget passed by the General Assembly.[4] Among them, inserted after the work of Delegate Clay Athey (R-Warren), was a $32.8 million bond issue for the RSW Regional Jail. With support from local delegates, the amendment passed during the reconvened Assembly's summer session. Its summary reads:

4 Voth, Sally. "McDonnell Seeking to Salvage Funds for Jail." *Northern Virginia Daily.* April 15, 2010. http://www.nvdaily.com/news/2010/04/mcdonnell-seeking-to-salvage-funds-for-jail.php

> *"[A]uthorizes the Virginia Public Building Authority [VPBA] to issue bonds in the amount of $32.8 million to pay the state's share of the construction costs of the new RSW Regional Jail. The regional jail will serve Rappahannock, Shenandoah, and Warren counties. The amendment also specifies that no state reimbursement for the project shall be made before July 1, 2012, and clarifies that any reimbursement for the new projects contained in the budget bill shall be subject to the Board of Corrections' approval of the final expenditures."*[5]

The amendment appears to fund half of the 375-bed facility's $68.3 million cost. However, the amendment contains three important qualifications which increase the burden on the three counties concerned.

First, the state bonds are a reimbursement, not a payment. The RSW Regional Jail Authority (RSW RJA) issues bonds to acquire cash to pay contractors. It can then apply to the Virginia Public Building Authority for reimbursement. The time value of money creates an additional local cost proportionate to the state's delay in reimbursement. VPBA has no incentive to act quickly.

Second, no reimbursements may be made until July, 1, 2012. This date is the beginning of the biennium following the end of the current budget – a tactic to add projects without increasing the current budget's bottom line. If the RSW RJA breaks ground before then, it will be on its own for the first payments, including large outlays for design, land purchase, and site preparation. The time value of money again favors the state. Additionally, there are two more General Assembly sessions before July 1, 2012, and one more general election in 2011. Political maneuvering could reduce the $32.8 million appropriation or remove it altogether, leaving the RSW RJA on the hook for a half-completed jail.

Third, the Board of Corrections reviews all payments for the state's share. The review board is not likely to be sympathetic to poor planning, mistakes, and cost overruns. If the jail ends up costing more than $68.3 million, the local authority is likely to bear the burden of it. The Authority would be wise to emphasize experience with the local conditions when requesting construction bids.

The table below shows how statewide bond issuers have better bond ratings and lower borrowing costs than regional authorities.

5 Department of Planning and Budget. *Governor's 2010 Reconvened Session Executive Amendments (House Bill 30)*, 14.

Table 2: Virginia Bond Ratings *(source: http://www.municipalbonds.com)*			
Authority	**Moody's Rating**	**Authority**	**Moody's Rating**
Middle River RJA	**A1**	**Rappahannock RJA (Stafford County)**	**Aa3**
Northwestern RJA	**A1**	**Blue Ridge RJA (Lynchburg)**	**A2**
State Public Buildings	**Aa1**	**State College Buildings**	**Aa1**

The Rappahannock-Shenandoah-Warren Regional Jail Authority is likely to be graded like the other Shenandoah Valley RJAs: A1. A 25-year bond has a 5% coupon. The State Public Buildings Authority has a better rating and lower costs of borrowing, but it funds, at most, half of the construction costs.

The amortization tables attached in Appendix A show the costs of issuing bonds of different periods and rates. I divide a $68.3 million construction cost into thirds and use 5-, 10-, and 25-year bonds to finance one-third each. The Northwestern Regional Jail Authority is a peer project for financing purposes, and its 5-, 10-, and 25-year bonds have rates of 3.25%, 3.75%, and 5%, respectively. Amortizing these bond issues illustrates a total interest cost of $26.3 million. So the total construction cost, including interest, is actually $92 million, not $68 million.

A pessimistic assumption is that the state delays reimbursement so long that the RSW Authority must initially pay all bills and finance the entire cost as shown above. In such a case, the state's $32.8 million reimbursement falls in value from half of the facility's cost to almost a third. If, however, state reimbursement can arrive quickly enough that the RSW Authority need only issue $35 million in bonds, the financing picture greatly improves.

The second section of Appendix A shows amortization tables if the RSW Authority uses the same debt instruments but only finances $33 million, the other half having arrived promptly from the state. Total interest payments are halved to $13 million, and total local cost is $46 million. Prompt reimbursement from the state would greatly benefit the finances of the three counties.

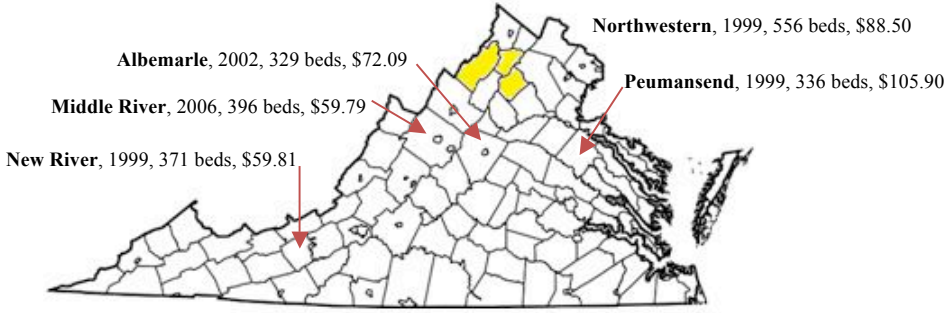
General Operating Efficiency

Two important determinants of operating cost for a jail are its age and its capacity. All else equal, a newer jail operates at a lower cost per inmate-day, as it benefits from new equipment in good working order. Larger jails benefit from economies of scale in most inmate services and overhead costs, and operate at a lower cost per inmate-day than smaller jails. Both of these variables are constrained, however. New jails have large up-front costs of construction

and financing. Large jails add significant transportation costs for visits and trials. So for each community there is an optimum size of jail, and a corresponding appropriate operating cost.

The final important determinant of operating cost is the local labor market. Rural jails tend to operate at a lower cost per inmate-day, as the local market supplies labor at a lower wage: this is one reason why many state and federal prisons are in rural areas. Below is a map of regional jails most closely comparable to the proposed RSW facility, with their date of completion, inmate capacity, and FY09 total cost per inmate-day.[6] The highlighted region is the service area for the 375-bed RSW jail.

Figure 2: Year of Completion, Capacity, and FY09 Inmate-Day Operating Cost of Peer Facilities



One rough way to estimate annual operating costs is to multiply the average cost per inmate-day among these five peer facilities, $77.22, by 375 inmates at capacity, by 365 days per year. By this rough method, the annual operating costs for a hypothetical RWS Regional Jail, at 100 percent capacity, in FY09 would have been $10,569,214.

Examining the Compensation Board reports yields some interesting trends. Looking only at the bottom line operating costs, consolidated regional jails operate consistently more efficiently than isolated county jails. In the locality spending graph, the expenditures for Rappahannock, Warren, and Shenandoah Counties, with their county jails, are compared to demographically similar counties which participate in regional jails: Clarke, Giles, and Rockbridge.[7] The peer counties enjoy lower costs and a lower rate of inflation for jail costs. In the unit cost graph, daily cost per inmate for the RWS county jails are compared to those for demographically similar regional jails: Albemarle, New River, Northwestern, and Peumansend. Regional jails appear to enjoy lower and less erratic operating costs.

6 Robyn de Socio. *FY 2009 Jail Cost Report.*

7 I chose these three counties because they have participated in a regional jail authority since at least FY 2001 and because they are similar to Rappahannock, Shenandoah, and Warren in some general demographic areas, according to 2008 Census data.

Figure 3: Locality Spending on Jails

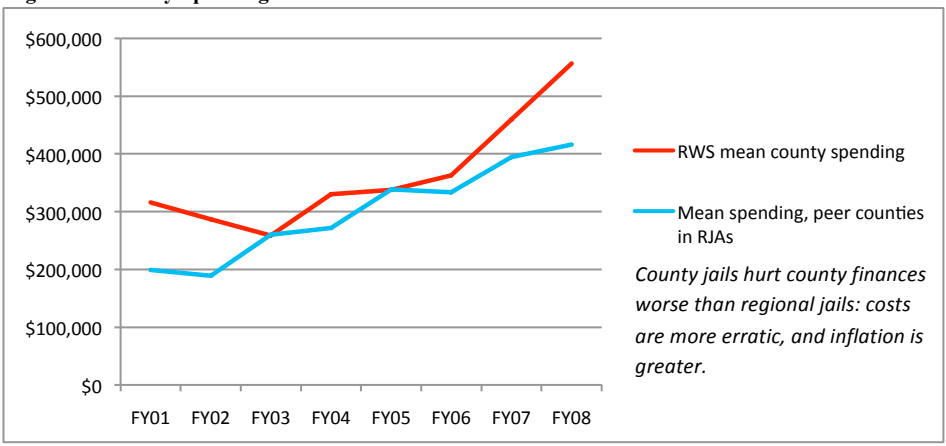
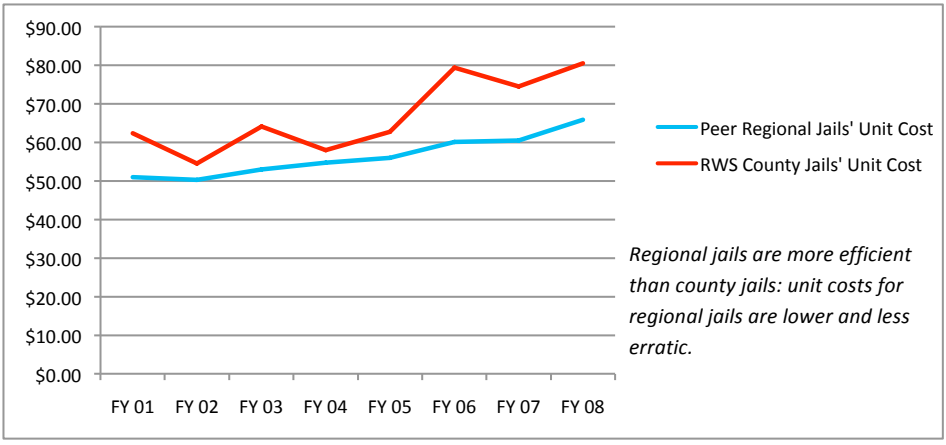


Figure 4: Cost/Inmate-Day, County vs. Regional Jails



Since 2000, the magnitude of county jail spending consistently exceeded that of regional jails. Additionally, the trend lines for the county jails are steeper: for unit cost, m_{RWS}=3.3 and $m_{Regionals}$=2.1. For locality spending, the inflation difference is small (m_{RWS}=34,172 and m_{peers}=33,742), but isolated counties do spend more. In 2009, the state Compensation Board found regional jails' unit operating costs to be 30 percent lower than those of county jails.[8] County spending on jails is also much more erratic when the county goes it alone.

This cursory analysis suggests that the three rural counties in question might stand to save money and improve effectiveness by regionally consolidating their jail activities.

Fixed and Variable Costs

This section suggests that the lower unit cost of a regional jail occurs through a combination of reduced fixed and variable costs, mostly relating to economies of scale. The next sec-

8 Robyn de Socio. *FY 2009 Jail Cost Report.*

tion explores the effectiveness of jail programs, which also improves in scaling up from the isolated county jail to the consolidated regional jail.

Appendix B shows the organizational chart for proposed RSW regional jail's nearest peer facility, the Northwestern regional jail in Winchester. Each box on the chart captures a different proportion of fixed and variable costs, and the variable costs for each box are more or less elastic with respect to volume. Accurately assigning costs to each box for the three county jails and standardizing by fractions of the overall load is an analytical task which the available budget data do not support. However, it is possible to consider each box in the abstract.

Security costs vary according to inmate load, theoretically on a kind of cubic function like the one shown in Figure 6. A larger facility requires less security spending per inmate due to improved technology and architecture; however, as a facility exceeds capacity and crowds, security costs may increase sharply.

Figure 6: Marginal Security Costs (Y) Against Inmate Population (X)

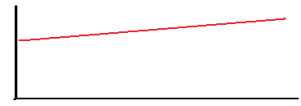
Support services encounter high fixed costs of equipment, and the economies of scale may be less significant here. Equipment scales up in distinct steps. Adding a second vehicle for transport, a second commercial refrigerator, a second booking clerk or psychologist is expensive, and efficiencies only occur at the high-load area of each step. Because a jail cannot easily choose its level of output (inmates booked, fed, or driven to court), it may have little control over the efficiency or inefficiency of step-fixed costs.

Figure 7: Support Services Costs against Inmate Population

Of the jail's organizational boxes, Community Corrections encounter particularly high fixed startup costs relative to variable costs. For example, setting up a Spanish-language anger management class and hiring and training the teacher is expensive, but the marginal cost of enrolling one more inmate is low. Likewise for work release: building the initial private-sector network, establishing policy, and training staff is expensive, but adding one more inmate to the work detail is not. Consolidated regional jails' pooled resources can surmount the barrier to entry and offer superior Community Corrections. Cases in point: Rappahannock County Jail has no local work release or house arrest capability, none of the three counties offer in-house pretrial services to assist with bail, and adjacent Page County funded no inmate training programs in FY 2008.[9]

Finally, general administrative cost patterns could resemble any of the above. Staff training cost curves look the same as inmate training cost curves; an advanced self-defense class for guards has the same cost behavior as the Spanish-language anger management class described above. Automation's fixed equipment costs behave like the step

Figure 8: Marginal Community Corrections Costs against Inmate Population



9 Robyn de Socio. *FY 2008 Jail Cost Report*.

function of the support services equipment. Upper management costs may have the same cubic behavior in response to load as security.

Effectiveness and Jail Programs

Considerable savings could be achieved if the mission of jails considered only housing and securing inmates at the lowest possible cost. There would be no flu shots, landscaping expenses, or GED classes. However, effectiveness for jails also considers the physical safety and health of staff and inmates, the overall ambience of the facility, and the rehabilitation of inmates.

Some additional cost for jail programming is not for inmates, but for staff. The Northwestern Regional Jail touts the implementation of physical agility training for guards to improve their health, safety, and morale. In an e-mail, Superintendent Conover stated that the marginal programs he would implement next, if funding became available, included 16 extra "hours of training per year for each staff member in areas such as: recognizing and managing the mentally ill; interpersonal communications; suicide prevention; self-defense; etc."[10]

Programs for inmates aim to reduce security risks, improve their productivity while in jail, and reduce recidivism through rehabilitation. Because jails hold inmates for less time than prisons do, the third goal is less important. Programs to reduce security risks for violent offenders also accomplish a degree of rehabilitation and include anger management and English courses for non-native speakers. More pure rehabilitative programs include GED classes and financial literacy training.

A number of programs put inmates to productive use. They work at low pay supporting the jail infrastructure, tending grounds, cleaning laundry, and mopping floors. In work release programs, low-risk inmates leave the facility under guard to work in the community, collecting trash or contracting with local firms or non-profits. To the extent that these jobs provide skills and strengthen character, they are also rehabilitative even as they generate income for the jail. The rehabilitative aspect should not be overstated, however, as the work tends to be low-skilled, and the jail's emphasis is on cost reduction.

Finally, pretrial services and electronic home monitoring are jail-administered services which keep offenders out of jail altogether. Bail counseling and house arrest require some staff costs but stress a jail's infrastructure much less.

Taken together, this array of programs makes a jail considerably more effective. Yet they have real costs, particularly on the front end, to establish them. Many Virginia jails, including the three county jails in this case, find their budgets too tight to offer programs beyond the bare minimum.

10 Bruce Conover. Email message to author. April 19, 2010.

Northwestern Regional Jail Budget Analysis

In order to be transparent and helpful to citizens and staff alike, a regional jail's budget should consider contemporary public finance standards. Presentation by line item and general ledger code does not reveal fixed versus variable costs or elasticity with respect to service loads. A flexible or program budget process would make the budget more accessible to those without strong accounting backgrounds.

In creating an estimated flexible program budget for the proposed RWS Regional Jail, I looked to its closest neighbor, the Northwestern Regional Jail (NRJ) in Winchester. I chose the NRJ facility partly out of convenience – it is the jail nearest my home, and I am a "constituent" – and partly because it reflects many of the same trends which apply to the costs at the RWS jail.

NRJ's Superintendent Bruce Conover, Chief of Administrative Services Captain Kathy Sasser, and Business Manager Jeanette Wedekind were very helpful in my research, copying a budget that was not available online. However, the annual budget documents provided left much to be desired. The core of the documents were statements of cost requests for the upcoming fiscal year, grouped by general ledger code. For example, there was $267,283 for Medical and Laboratory, and subheadings state $5,000 for flu shots, $100 for biohazard waste containers, $1,000 for AED machines, and $212,725 for general medical supplies. Within the codes, there is no consistent information about which functional units (see Appendix B's Organizational Chart) are using which items. Distinctions between specific lines are unclear. Information about unit costs does not exist frequently or consistently.

The task of organizing the budget by cost center according to the organization chart to identify the sources of variance is daunting and beyond the scope of many citizens and journalists. I attempt it in the next section, but NRJ's budget officer should present this information. Program budgeting shows costs according to their use in real life, which would be helpful information for staff and citizen alike.

Additionally, the budget should account for possible variation in load. In FY09, NRJ overran its projected $17.6 million expenses by more than $1 million, but the FY09 budget document presents no planning for variation in load beyond the maintenance of a 45-day Operating Reserve account. The budget document should present low, medium, and high load forecasts for the coming year, with data on how such variation would affect each budget line. For example, how much more would it cost to clear a record snowfall versus the FY10 budgeted amount of $6,000? Or, if inmate load is 10 percent higher than expected, which expenditures increase by more than 10 percent and which increase by less? Flexible budgeting provides important information for both staff and citizens. Flex projections could be as simple as two additional columns of data, added to the right side of the current ledger presentation, to show optimistic and pessimistic projections, or the projections could complement a cost-center presentation.

Jail managers could do more to assist the public, regional bureaucrats, and their own staff

if they added cost-center and flexible budget data to their annual reports.

Hypothetical RSW Regional Jail Flexible Budget

Table 3 shows a projected operating budget for the completed RSW Regional Jail in the first year of its operation, FY 2015. To create this budget, I used the following procedure:

1. For staffing levels, I used the NRJ budget and annual report, along with Compensation Board reports, to estimate 138 staff for a facility of RSW's size. At 100% capacity, a shift team of 24 officers secures 375 inmates, a ratio of 15.6:1. I arrived at a conservative estimate of annual salary and benefits of $79,229 by examining NRJ's budget, assuming 10% lower wage rates for a more rural area, and assuming that the facility will hire many employees who already have considerable government tenure.

2. For salaries and equipment, I analyzed the NRJ budgets line by line. Each ledger code aligned with one of seven program areas: Security, Food Service, Medical, Programs for Inmates, Transport, Administration, and Maintenance. Where a ledger code aligned with more than one program (for example, code 5408-02 Vehicle Fuels and Lubricants applies to both Transport's police cars and Maintenance's lawn mowers), I divided the cost roughly. I forecast each cost out to FY 2015 assuming 4% annual inflation.

3. Using the analysis of fixed and variable costs in the previous section, I labeled each ledger code's price elasticity with respect to demand as Low, Medium, or High. For example, Boiler Insurance is a fixed cost with no elasticity. Linens are a variable cost with low elasticity due to bulk purchasing. Kits for indigent inmates have medium elasticity because they are purchased in smaller quantities. Contracted medical services have high elasticity because of constrained local supply. I then assigned a percentage modifier for each ordinal label and applied it to the estimates from Step 2.

4. The standard service unit is the inmate-day. There are 365 days in a year. At 100% capacity, the jail holds 375 inmates. At 90% capacity, it holds 338. At 120% capacity, it holds 450. I simply divided the costs in Step 3 to arrive at a unit cost for each load level.

Table 3: Operating Expenditures According to Modified Compensation Board Categories						
	90% Use	Per Unit	100% Use	Per Unit	120% Use	Per Unit
Security Services	$6,703,621	$54.42	$7,063,245	$51.60	$8,822,595	$53.71
Salaries: 96 FTE at 100%	$6,587,324	$53.47	$6,934,025	$50.66	$8,667,531	$52.77
Supplies & Equipment	$116,298	$0.94	$129,219	$0.94	$155,063	$0.94
Food Services	$1,666,272	$13.53	$1,776,157	$12.98	$2,114,810	$12.88
Salaries: 10 FTE at 100%	$686,180	$5.57	$722,294	$5.28	$902,868	$5.50
Supplies & Equipment	$980,092	$7.96	$1,053,863	$7.70	$1,211,942	$7.38
Medical Services	$1,297,019	$10.53	$1,474,919	$10.78	$1,843,649	$11.22
Salaries: 4 FTE at 100%	$288,918	$2.35	$288,918	$2.11	$361,147	$2.20
Supplies & Equipment	$1,008,101	$8.18	$1,186,002	$8.66	$1,482,502	$9.03
Inmate Programs	$551,651	$4.48	$583,853	$4.27	$693,100	$4.22
Salaries: 6 FTE at 100%	$411,708	$3.34	$433,377	$3.17	$520,052	$3.17
Supplies & Equipment	$139,943	$1.14	$150,477	$1.10	$173,048	$1.05
Transportation	$166,788	$1.35	$169,269	$1.24	$210,346	$1.28
Salaries: 2 FTE at 100%	$144,459	$1.17	$144,459	$1.06	$180,574	$1.10
Supplies & Equipment	$22,329	$0.18	$24,810	$0.18	$29,772	$0.18
Administration	$1,044,490	$8.48	$1,116,404	$8.16	$1,260,233	$7.67
Salaries: 11 FTE at 100%	$754,798	$6.13	$794,524	$5.80	$873,976	$5.32
Supplies & Equipment	$289,692	$2.35	$321,880	$2.35	$386,256	$2.35
Maintenance & Utilities	$1,674,398	$13.59	$1,762,524	$12.88	$1,938,776	$11.80
Salaries: 9 FTE at 100%	$617,562	$5.01	$650,065	$4.75	$715,071	$4.35
Supplies & Equipment	$1,056,836	$8.58	$1,112,459	$8.13	$1,223,705	$7.45
Total Salaries: 138 FTE @ 100%	$9,490,947	$77.04	$11,195,561	$81.79	$12,221,219	$74.41
Total Supplies & Equipment	$3,613,292	$29.33	3,978,710	$29.07	$4,662,289	$28.39
Total Operating	$13,104,239	$106.38	$15,174,272	$110.86	$16,883,509	$102.79

One important observation in this budget is that the 375-inmate stated capacity is actually an inefficient output level. RSW can probably operate more efficiently at a slight overcrowd without significantly reducing effectiveness and safety.

Because this estimate borrows so heavily from the NRJ budgets, it carries the bias of the general management efficiency of that institution. I am assuming that the RSW jail in the Front Royal area will not be run much better or worse than NRJ in Winchester. This example budget, while rough, illustrates some important trends and provides a template for future work with better data and additional resources.

The most important observation on the expenditure side relates to personnel costs. Jail employees receive overtime pay as load exceeds capacity: maintenance workers stay longer to address greater equipment wear, and food service workers stay longer to prep and clean up. However, when load is under capacity, it is not easy to temporarily reduce the number of salaried staff. Labor costs per unit are actually lower at a 120% load.

However, programs that reduce personnel costs, particularly in the largest program, Security, are likely to be a good value. In the pretrial services program, for example, a small staff with office and travel expenses can keep dozens of inmates out of cells, reducing the need for overtime security as well as other inmate-related expenses in laundry, food, and healthcare. House arrest programs using electronic monitoring are also highly cost-effective. The fiscal benefits of the Community Corrections activities are not clear in the line-item budget presentation. This flexible program budget helps, but I was not able to accurately determine the marginal cost of each additional inmate at different load levels.

Table 4: Debt Service and Total Cost by Occupancy Load

	90% Use	**Per Unit**	**100% Use**	**Per Unit**	**120% Use**	**Per Unit**
Debt Service	$4,538,923	$36.85	$4,538,923	$33.16	$4,538,923	$27.63
Total Cost	$17,643,162	$143.22	$19,713,195	$144.02	$21,422,432	$130.43

Applying unit costs to the optimistic amortization of debt on page two of Appendix A yields the figures shown in Table 4. The first years after completion have the greatest debt service costs, because 5-, 10-, and 25-year bonds must all be repaid.

Table 5: FY 2015 Revenue Estimate for RSW Regional Jail

Source			100% Load	Change Action	120% Load
Own	**Work Release**	$20/day, 30 workers	$219,000	Increase to 50 workers	$365,000
	House Arrest	$20/day, 20 participants	$146,000	none	$146,000
	Local Transfer	69 inmates, $110.86 per inmate-day	$2,792,009	$102.79 * 139	$5,215,051
	Medical Co-Pay	.66 NRJ10, 10% inflation	$58,310	20% more	$69,971
	Phones	.66 NRJ10, 4% inflation	$140,523	20% more	$168,628
	Misc. Fees	.66 NRJ10, 4% inflation	$11,242	20% more	$13,490
Local	**Rappahannock**	7.2% of Local Cost	$717,160		$596,375
	Shenandoah	29.5% of Local Cost	$2,938,366		$2,443,480
	Warren	63.3% of Local Cost	$6,305,035		$5,243,128
State	**State Beds**	20 beds, $20 per inmate-day	146000	Increase to 25 beds	$182,500
	Comp. Board	42% of Total Salaries ($11.2m)	$4,702,136	$12.2 mil	$5,132,912
	Per Diem	$10 per inmate-day	$1,368,750		$1,642,500
Fed.	**Grants**	.66 of NRJ 10	$168,664	20% more	$202,397
		Total Non-local Revenue	$9,752,634		$13,138,449
		Total Local Revenue	$9,960,561		$8,282,983
		Total Revenue	**$19,713,195**		**$21,421,432**

Table 5 shows a revenue forecast for RSW Regional Jail in FY 2015. It draws heavily from the revenue statement at Northwestern Regional Jail. Enrollment in the Work Release and House Arrest programs is realistic. However, an administrative initiative to expand the programs could increase revenue. A critical factor is the third own-source revenue line, Transfer Beds. Currently, all of the jails around RSW except Northwestern are considerably overcrowded. Under state law, localities can send inmates to another jail if they pay the average daily cost at the receiving jail. Because of fixed costs, the average cost exceeds the marginal cost of the transferred inmate, and the receiving facility makes a profit on the transaction.

Combining the inmate population trends for the three counties in RSW's service yields only 286 inmates for FY15. The state likely reserves about twenty beds for its own use, at the low reimbursement rate of $20/day. The jail can receive sixty-nine inmates from other jails and be at 100% capacity. This transfer generates some $5.2 million in revenue. If RSW operates at 120% capacity, still on the low end of crowding compared to its local peers, it can accommodate five more state beds and seventy more transfers from other local jails. This expansion reduces Rappahannock County's obligatory transfer to the RSW Regional Jail Authority by about $120,000. Shenandoah County saves $500,000, and Warren County saves just over $1,000,000 compared to operation at 100% capacity.

The proportions of local cost – Warren County paying the most – rely on trending jail populations cited in the Compensation Board's reports from the last eight years. Warren County showed the most growth in its jail population. Because all three counties are fairly small, the proportions of county expenditures in this example are probably inaccurate; a proportion of R:S:W = 0.15 : 0.40 : 0.45 may be more accurate. The table below shows costs to local governments under those proportions. Either way, in my estimate, the Total Local Revenue line is more reliable than any county estimate.

Table 6: Local Contributions by Occupancy Load

County	**Proportion**	**FY 2015 Expenditure, 100% Use**	**120% Use**
Rappahannock	15%	$1,494,084	$1,242,447
Shenandoah	40%	$3,984,224	$3,313,193
Warren	45%	$4,482,253	$3,727,343
Total Local Expenditures		$9,960,561	$8,282,983

Alternatives to RSW Regional Jail

This narrative will briefly treat two alternatives to the proposed regional jail. The first is the status quo, maintaining the three county jails in their current state. The second is to renovate and expand the three county jails.

Support for the proposed regional jail is not universal in the tri-county area. Some citizens and law enforcement officers advocate simply maintaining the current system of three functioning county jails. The regional jail may prove to be a boondoggle, and the current system

has proven reasonably reliable and effective.

The status quo is the lowest cost option, at least in the short term. There is no debt to service, and the behavior of costs is well known. There is no technological learning curve and no tri-county partnership to negotiate. The three county jails are also near, or even adjacent to, the county courthouses, helping to speed trials. Having a community jail may also yield fairness benefits to inmates who can more easily receive visitors.

However, the three county jails also have significant problems. All are overcrowded to nearly double their stated capacity. Housing two inmates in a room for one poses hygiene and safety concerns. Obsolete architecture and technology may have contributed to suicides at Warren County Jail in June 2009 and February 2011, "It doesn't help, [Sheriff Daniel] McEathron said, that Warren County has an outdated jail."[11] The small scale of current facilities also precludes most inmate programs, including the rehabilitative, like GED courses, and the practical, like inmate workforce. These inefficiencies represent a potentially dangerous source of cost increases over time, and they also limit the effectiveness of the jail to the bare minimum of housing inmates. The Board of Corrections' report plainly states, "All three facilities are in need of some major renovations."[12]

Renovating and expanding the three jails is perhaps a more obvious solution than collaborating to build a new regional jail: simply fix the stated shortcomings by upgrading the facilities. All three received some rehabilitation work in 1991, and another, more extensive renovation twenty years later could address the stated problems.

Renovated county jails retain some benefits of the status quo. They remain in the principal towns of each county, close to the courthouses and convenient for business and visitation. Operating fully within the county sheriffs' departments, they are organizationally simple, with no need for a regional jail authority comprised of three counties' elected officials. Individually, the renovation projects could align more closely with the policies, plans, and finances of each county. Considering the current state of their budgets, a gradual renovation with smaller, piecemeal debt issues might cost counties less in the short run than a regional jail.

Yet triple renovations have several problems. Most importantly, the necessary additions may not be technically possible. The Shenandoah County jail dates to the 1830s: its brick shell may not accept another story, expanded basement, or wing. And with every neighboring jail seriously overcrowded, there is no cheap or simple solution of moving the jails' current inmates while the renovations are underway. With their downtown locations, additional wings may face steeper real estate costs. Finally, expanded local jails may still face barriers to implementing modern programs for inmates; for example, all three counties face growing Hispanic populations, but each alone may not reach the critical mass of Hispanic inmates

11 Ben Orcutt. "Warren County inmate dies days after attempted hanging." *Northern Virginia Daily.* March 5, 2011. Available at http://www.nvdaily.com/news/2011/03/warren-county-inmate-dies-days-after-attempted-hanging.php.
12 Virginia Department of Corrections. Annual Report of Board of Corrections: Approved Jail Projects.

necessary to justify language classes for inmates or staff, resulting in service inequities. Cooperation and regional partnerships are a possibility, but distance imposes transaction costs.

Cost-Benefit Analysis

I have no information on the alternative of renovating the existing jails. Further, the benefits of jail services defy quantification, so the plan below outlines a cost-benefit analysis which may be undertaken. A two-tiered methodology captures some of the complexity and uncertainty associated with major decisions like this one. The first level is a weighted score table to assess diverse qualitative benefits. The second level is a net present value analysis for the finances of each project. I provide fictional examples as academic illustrations. The fictitious values represent no deep research on the subjects, nor do they represent any conclusions or inclinations of mine. They simply illustrate the proposed methodology.

Level 1: Weighted Score Table

R. Gregory Michal writes, "A weighted score table is an effective way to evaluate alternatives when criteria differ in importance."[13]

While the bottom-line fiscal impact of the three jail proposals matters, the question of value is more complex and involves a number of factors. Weighted score tables present a list of criteria with a relative weight or modifier assigned to each. Each proposal receives a score for each criterion. Ideally, a valid quantitative measure will inform each score. The modifier then weights the score to yield a weighted score, and the proposal with the greatest total of weighted scores may be called the best value.

Bias enters weighted score tables easily. Assigning modifiers and scores contains some degree of subjectivity. At minimum, creating modifiers and assigning scores should be separate duties. Modifiers should reflect community preferences, possibly by using poll data or focus groups. If scores are not clearly linked to transparent data, then keeping democratic representation available for scoring is equally important.

A fictitious weighted score table for the three jail proposals follows in Appendix C. In the example given, the regional jail has the highest score and would be the best choice. However, the option to renovate and expand the local jails is not far behind, and a slight change to the scores or weights in even one category would return a different decision.

A final benefit to using weighted score tables may be community engagement. If planners and elected officials opt to include weighted score tables in decision making, and if they try to improve the tools' validity by involving local communities, then not only will the result be more accurate, but the process itself contributes to local democracy and buttresses the legitimacy of the decision

Weighted tables assist decision making when projects are dissimilar. However, when proposal are similar and the benefits can be quantified, net present value analysis provides a more reliable quantitative comparison of costs to benefits. This tool considers the monetary

13 R. Gregory Michal. *Decision Tools for Budgetary Analysis,* 15.

value of each proposal's costs and benefits over a number of years. It then applies a discount rate to assess the time value of money. Money's time value is the idea that a sum now is worth more than the same sum later, considering that the sum now could, if nothing else, be invested for interest. Net present value analysis considers that important difference.

Net present value analysis attempts a complete consideration of costs and benefits. Quoting Michal's discussion of the tool, the following are five important rules, with explanations and examples from the jail deliberations.[14]

1. "Forecast benefits and costs in today's dollars." Inflation creates an extra layer of distortion. Using real dollars for salary and supply costs enables a more meaningful comparison over time.

2. "Do not include sunk costs." Payments already made and which cannot be recouped by any proposal are sunk. The money already spent in studying the regional jail is sunk, as are last year's funds devoted to maintaining jails, which may soon be demolished.

3. "Include opportunity costs." The benefits foregone by choosing a certain proposal are opportunity costs. If the counties do not build the regional jail, one opportunity cost might be the income foregone by not demolishing to old local jails and selling the prime downtown property.

4. "Use expected value to estimate uncertain benefits and costs." When forecasting years into the future, costs and benefits become less certain, so a given cost or benefit should be multiplied by the probability of its occurring. For example, the regional jail projects a large revenue stream from other localities. But they may act simultaneously to build their own capacity, or state laws may change to sharply reduce the number of offenders, leaving the RSW Regional Jail under capacity and in the red. Projected benefits should assign a probability to this eventuality and reduce the magnitude of the benefits.

5. "Omit non-monetary costs and benefits." Intangibles do not belong in the net present value analysis. The regional jail project may be a political boon for local legislators, but that is not quantified. Nor is the risk to the lives of law enforcement officers or inmates, because human lives are not easily appraised.

Appendix D shows sample net present value tables for the three jail proposals. The first page uses a 3 percent discount rate, a fairly high opportunity cost for current funds, and the second page uses a 10 percent discount rate, a lower opportunity cost. The totals show both the net present value – the difference between net present benefit and cost – and the ratio of benefits to costs. The pair of figures is important in cases like this one, wherein the magnitude of projects varies.

14 R. Gregory Michal. *Decision Tools for Budgetary Analysis,* 15.

In the first example, the proposal to renovate and expand the existing jails has by far the best net present value. The regional jail actually incurs a net loss over 20 years. An important factor in the result is the high initial costs of construction for the regional jail and how it earns no return for four years, when the discounting is least impactful; conversely, the other two proposals continue to stable returns for most of the period.

In the second example, the lower opportunity cost for current funds diminishes the impact of the regional jail's low initial benefits and high construction costs. With a 10% discount rate it earns a solid net benefit greater than that of the status quo. However, the expansion/renovation proposal remains most efficient.

Concluding Concerns for Planners and Elected Officials

Four new regional jails exist near Rappahannock, Shenandoah, and Warren counties, in both rural and suburban areas. The localities that chartered those four regional jail authorities determined that cooperating to build a single consolidated facility would reduce local costs while improving effectiveness of service delivery. The calculations involved are complex, so planners and elected officials in the three rural counties concerned here should not rush to judgment, nor should they rely on the conclusions of their four regional peers. A rigorous cost-benefit analysis is necessary to determine whether a regional jail is in fact a better solution that renovating and expanding the local jails or doing nothing and maintaining the status quo.

In this case, such analysis was never published or presented to local citizens. On September 3, 2010, the RSW RJA announced the purchase of two parcels totaling 28 acres for $3.3 million.[15] On December 9, the authority awarded the architecture contract for $2.15 million.[16] The regional jail remains projected to open in 2014.

Limitations of my analysis extend to the trends in operating costs, the elasticity of different costs with respect to inmate load, and especially in quantifying the benefits of different proposals. I lacked enough data points over time and from different institutions to properly forecast trends in operating costs, so there is considerable uncertainty in each line of the estimated RSW operating budget for 2015. Because I probably failed to label many fixed costs as such and instead treated them as variable, the operating budget likely shows too high a total cost and too much change according to load. The operating cost at 100% capacity of $15,174,000 is a pessimistic figure.

However, this error may be partly offset by my use of the optimistic state reimbursement for construction. Local leaders should push the state agencies for prompt reimbursement of local expenses. If state reimbursement happens within the acceptable timeframe for paying contractors, local debt issue and borrowing costs fall by as much as 50 percent. Even establishing reliably when the state payments will arrive could prevent some unnecessary borrow-

15 Orcutt, Ben. "Purchase of jail land finalized." *Northern Virginia Daily.* September 4, 2010. Available at http://www.nvdaily.com/news/2010/09/purchase-of-jail-land-finalized.php.

16 Outlaw III, Linwood. "Authority approves new jail's architect." *Northern Virginia Daily.* December 10, 2010. Available at http://www.nvdaily.com/news/2010/12/authority-approves-new-jails-architect.php.

ing. This kind of coordination between levels of government breaks down often enough to warrant a recommendation: RSW Jail Authority staff should monitor state reimbursement activity and partner with state agency staff to avoid surprises in reimbursements.

I am not certain that a regional jail will reduce the expenditures of each county on jail services. A regional jail will provide more stable expenditures versus the more erratic year-to-year costs of a county jail. The counties may accept a higher, more stable cost curve versus one that is highly variable. Additionally, the regional jail does allow for a broader scope of programs for inmates. However, a new facility does not automatically provide diverse opportunities for inmates: a regional jail may certainly be a simple warehousing operation with no efforts to train or rehabilitate. The regional jail's larger inmate volume provides economies of scale for inmate programs; GED classes, work release partnerships with local firms, and the like may be practical with a 400-bed regional jail but not with an 80-bed county jail. Counties may be willing to pay more for the capability for such programs, even if they do not intend to use them in the first year of operation. Excess capacity and potentiality have real value.

Planners might also consider the worsening state of the Commonwealth's jails generally. Inmate populations are growing faster than capacity, and almost all of Virginia's jails are overcrowded. If constructed, the RSW Regional Jail could easily absorb 100 inmates from Northern Virginia. The system of compensation whereby sending localities pay the receiving jail at average (rather than marginal) cost expresses the benefits of reduced crowding. However, the state government could acknowledge the broader benefits of building regional jails with excess capacity. The RSW Regional Jail is unusual in the way that it helps wealthy Northern Virginia, some 80 miles away. As the three rural counties build it, some extra state assistance with capital costs might be justified.

The RSW Regional Jail has the potential to bring three rural counties into the current century of penal realities. Improving services to inmates could help prevent future crimes while providing interdependent support for the highly populated suburbs. The jail also has the potential to be an unhappy boondoggle for three counties that cannot afford such a large mistake. The operating costs of such a big project could sap their budgets, and the large debt issue could damage the credit they need for schools. But recent trends in corrections suggest that if you build it, they will come.

Appendix A: Amortization Tables

This amortization table shows a pessimistic reimbursement assumption.

5-year Bonds, 3.25% coupon

Principal Owed at Beginning of Year	Annual Payment	3.25% Interest	Repayment of Principal	Principal Owed at End of Year
$22,767,000	$4,838,143	$739,928	$4,098,216	$18,668,784
$18,668,784	$4,838,143	$606,735	$4,231,408	$14,437,377
$14,437,377	$4,838,143	$469,215	$4,368,928	$10,068,448
$10,068,448	$4,838,143	$327,225	$4,510,919	$5,557,530
$5,557,530	$4,838,143	$180,620	$4,657,523	$900,007
		$2,323,722		

10-year Bonds, 3.75% coupon

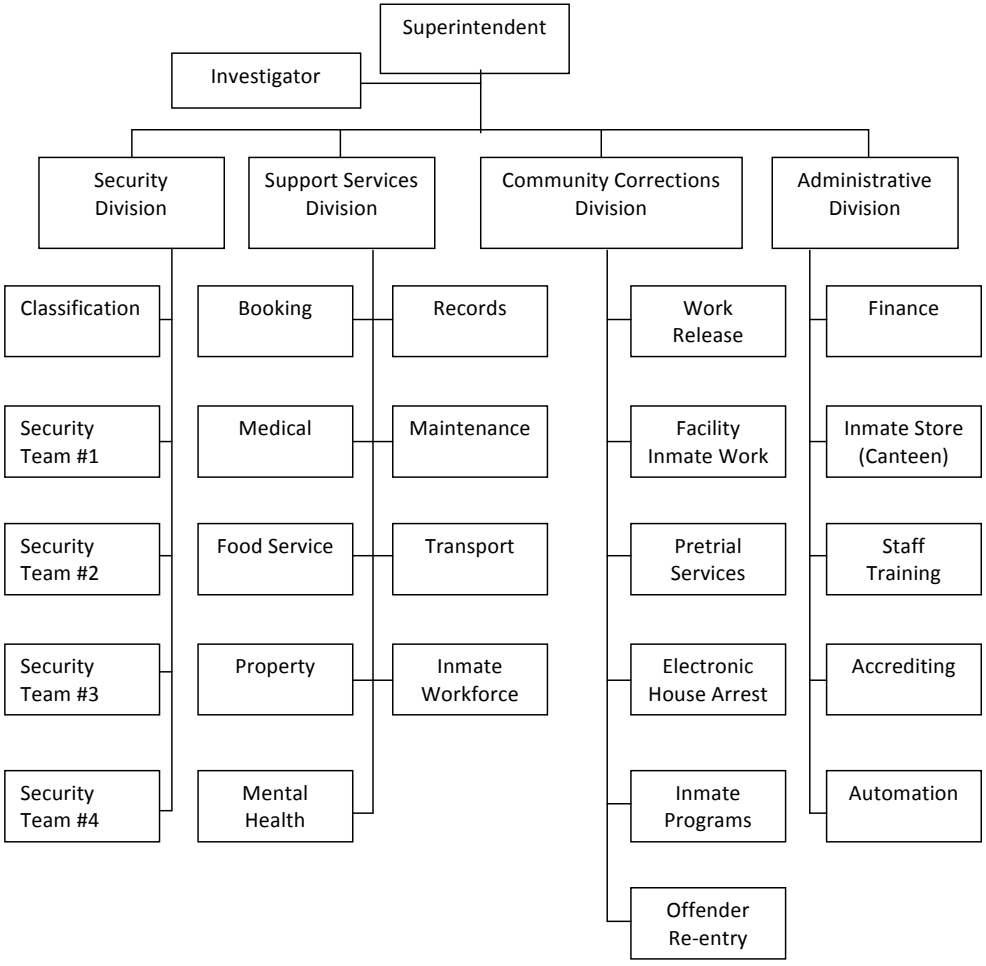
Principal Owed at Beginning of Year	Annual Payment	3.75% Interest	Repayment of Principal	Principal Owed at End of Year
$22,767,000	$2,678,750	$853,763	$1,824,987	$20,942,013
$20,942,013	$2,678,750	$785,325	$1,893,424	$19,048,589
$19,048,589	$2,678,750	$714,322	$1,964,427	$17,084,161
$17,084,161	$2,678,750	$640,656	$2,038,093	$15,046,068
$15,046,068	$2,678,750	$564,228	$2,114,522	$12,931,546
$12,931,546	$2,678,750	$484,933	$2,193,817	$10,737,729
$10,737,729	$2,678,750	$402,665	$2,276,085	$8,461,645
$8,461,645	$2,678,750	$317,312	$2,361,438	$6,100,207
$6,100,207	$2,678,750	$228,758	$2,449,992	$3,650,215
$3,650,215	$2,678,750	$136,883	$2,541,866	$1,108,349
		$5,128,844		

25-year Bonds, 5% coupon						
Principal Owed at Beginning of Year	Annual Payment	5% Interest	Repayment of Principal	Principal Owed at End of Year		
$22,767,000	$1,560,954	$1,138,350	$422,604	$22,344,396		
$22,344,396	$1,560,954	$1,117,220	$443,734	$21,900,662		
$21,900,662	$1,560,954	$1,095,033	$465,921	$21,434,741		
$21,434,741	$1,560,954	$1,071,737	$489,217	$20,945,524		
$20,945,524	$1,560,954	$1,047,276	$513,678	$20,431,846		
$20,431,846	$1,560,954	$1,021,592	$539,362	$19,892,484		
$19,892,484	$1,560,954	$994,624	$566,330	$19,326,154		
$19,326,154	$1,560,954	$966,308	$594,646	$18,731,508		
$18,731,508	$1,560,954	$936,575	$624,379	$18,107,129		
$18,107,129	$1,560,954	$905,356	$655,598	$17,451,532		
$17,451,532	$1,560,954	$872,577	$688,377	$16,763,154		
$16,763,154	$1,560,954	$838,158	$722,796	$16,040,358		
$16,040,358	$1,560,954	$802,018	$758,936	$15,281,422		
$15,281,422	$1,560,954	$764,071	$796,883	$14,484,539		
$14,484,539	$1,560,954	$724,227	$836,727	$13,647,811		
$13,647,811	$1,560,954	$682,391	$878,563	$12,769,248		
$12,769,248	$1,560,954	$638,462	$922,492	$11,846,756		
$11,846,756	$1,560,954	$592,338	$968,616	$10,878,140		
$10,878,140	$1,560,954	$543,907	$1,017,047	$9,861,093		
$9,861,093	$1,560,954	$493,055	$1,067,899	$8,793,194		
$8,793,194	$1,560,954	$439,660	$1,121,294	$7,671,899		
$7,671,899	$1,560,954	$383,595	$1,177,359	$6,494,540		
$6,494,540	$1,560,954	$324,727	$1,236,227	$5,258,313		
$5,258,313	$1,560,954	$262,916	$1,298,038	$3,960,275		
$3,960,275	$1,560,954	$198,014	$1,362,940	$2,597,334		
		$18,854,186				
Total Interest Cost:	$26,306,752					
Total Cost of Funding and Interest:	$92,306,752					

Amortization Tables with Optimistic Reimbursement Assumption				
5-year Bonds, 3.25% coupon				
Principal Owed at Beginning of Year	Annual Payment	3.25% Interest	Repayment of Principal	Principal Owed at End of Year
$11,383,000	$2,419,072	$369,948	$2,049,124	$9,333,876
$9,333,876	$2,419,072	$303,351	$2,115,721	$7,218,155
$7,218,155	$2,419,072	$234,590	$2,184,481	$5,033,674
$5,033,674	$2,419,072	$163,594	$2,255,477	$2,778,197
$2,778,197	$2,419,072	$90,291	$2,328,780	$449,417
		$1,161,774		
10-year Bonds, 3.75% coupon				
Principal Owed at Beginning of Year	Annual Payment	3.75% Interest	Repayment of Principal	Principal Owed at End of Year
$11,383,000	$1,339,375	$426,863	$912,512	$10,470,488
$10,470,488	$1,339,375	$392,643	$946,731	$9,523,756
$9,523,756	$1,339,375	$357,141	$982,234	$8,541,522
$8,541,522	$1,339,375	$320,307	$1,019,068	$7,522,455
$7,522,455	$1,339,375	$282,092	$1,057,283	$6,465,172
$6,465,172	$1,339,375	$242,444	$1,096,931	$5,368,241
$5,368,241	$1,339,375	$201,309	$1,138,066	$4,230,175
$4,230,175	$1,339,375	$158,632	$1,180,743	$3,049,432
$3,049,432	$1,339,375	$114,354	$1,225,021	$1,824,411
$1,824,411	$1,339,375	$68,415	$1,270,959	$553,452
		$2,564,199		

25-year Bonds, 5% coupon				
Principal Owed at Beginning of Year	Annual Payment	5% Interest	Repayment of Principal	Principal Owed at End of Year
$11,383,000	$780,477	$569,150	$211,327	$11,171,673
$11,171,673	$780,477	$558,584	$221,893	$10,949,780
$10,949,780	$780,477	$547,489	$232,988	$10,716,792
$10,716,792	$780,477	$535,840	$244,637	$10,472,154
$10,472,154	$780,477	$523,608	$256,869	$10,215,285
$10,215,285	$780,477	$510,764	$269,713	$9,945,572
$9,945,572	$780,477	$497,279	$283,198	$9,662,374
$9,662,374	$780,477	$483,119	$297,358	$9,365,015
$9,365,015	$780,477	$468,251	$312,226	$9,052,789
$9,052,789	$780,477	$452,639	$327,838	$8,724,951
$8,724,951	$780,477	$436,248	$344,229	$8,380,722
$8,380,722	$780,477	$419,036	$361,441	$8,019,281
$8,019,281	$780,477	$400,964	$379,513	$7,639,768
$7,639,768	$780,477	$381,988	$398,489	$7,241,279
$7,241,279	$780,477	$362,064	$418,413	$6,822,866
$6,822,866	$780,477	$341,143	$439,334	$6,383,533
$6,383,533	$780,477	$319,177	$461,300	$5,922,232
$5,922,232	$780,477	$296,112	$484,365	$5,437,867
$5,437,867	$780,477	$271,893	$508,584	$4,929,283
$4,929,283	$780,477	$246,464	$534,013	$4,395,270
$4,395,270	$780,477	$219,764	$560,714	$3,834,557
$3,834,557	$780,477	$191,728	$588,749	$3,245,807
$3,245,807	$780,477	$162,290	$618,187	$2,627,621
$2,627,621	$780,477	$131,381	$649,096	$1,978,525
$1,978,525	$780,477	$98,926	$681,551	$1,296,974
		$9,425,900		
Total Interest Cost:	$13,151,873			
Total Cost of Funding & Interest:	$46,151,873			

Appendix B: Organization Chart for Northwestern Regional Jail



Appendix C: Sample Weighted Score Table for Jail Proposals							
		Maintain Existing County Jails		Expand Existing County Jails		Construct New Regional Jail	
Criteria	**Weight (1-10)**	**Score (1-10)**	**Weighted Score**	**Score**	**Weighted Score**	**Score**	**Weighted Score**
Requires Debt Issue	6	10	60	5	30	1	6
Initial Costs	8	10	80	6	48	2	16
Future Costs	7	3	21	5	35	6	42
Convenient Downtown	3	10	30	10	30	1	3
Displaces Current Inmates	6	8	48	3	18	10	60
Reduces Escape Risk	7	2	14	7	49	9	63
Anticipates Local Population Growth	9	2	18	7	63	8	72
Ameliorates Statewide Jail Crowding	4	3	12	6	24	10	40
Facilitates New Programs for Inmates	3	2	6	4	12	6	18
Improves Inmate Living Conditions	3	2	6	7	21	7	21
		Total	**295**	**Total**	**330**	**Total**	**341**

Appendix D: Net Present Value Analysis

Cost and Benefits are in millions of dollars and refer to the three localities only.

This table uses a 3% discount rate. The next table uses a 10% discount rate.

	Maintain County Jails				**Expand County Jails**				**Construct Regional Jail**			
Fiscal Year	Costs	Benefits	NPC	NPB	Costs	Benefits	NPC	NPB	Costs	Benefits	NPC	NPB
2011	1.8	3.3	1.8	3.3	1.8	3.3	1.8	3.3	1.0	0.0	1.0	0.0
2012	2.7	3.3	2.6	3.2	6.0	3.3	5.8	3.2	11.0	0.0	10.7	0.0
2013	2.4	3.3	2.3	3.1	6.0	3.3	5.7	3.1	11.0	0.0	10.4	0.0
2014	2.5	3.3	2.3	3.0	6.0	3.3	5.5	3.0	11.0	0.0	10.1	0.0
2015	2.6	3.3	2.3	2.9	3.0	6.0	2.7	5.3	8.3	10.0	7.4	8.9
2016	2.7	3.3	2.3	2.8	3.0	5.9	2.6	5.1	8.3	9.9	7.2	8.5
2017	2.8	3.3	2.3	2.8	3.0	5.9	2.5	4.9	8.3	9.8	7.0	8.2
2018	2.9	3.3	2.4	2.7	3.1	5.8	2.5	4.7	8.4	9.7	6.8	7.9
2019	3.0	3.3	2.4	2.6	3.1	5.8	2.4	4.6	6.4	9.6	5.1	7.6
2020	3.1	3.3	2.4	2.5	3.1	5.7	2.4	4.4	6.4	9.5	4.9	7.3
2021	3.2	3.3	2.4	2.5	3.2	5.7	2.4	4.2	6.4	9.4	4.8	7.0
2022	3.3	3.3	2.4	2.4	3.2	5.6	2.3	4.0	6.5	9.3	4.7	6.7
2023	3.4	3.3	2.4	2.3	3.2	5.6	2.2	3.9	6.5	9.2	4.6	6.5
2024	3.5	3.3	2.4	2.2	3.3	5.5	2.2	3.7	6.5	9.1	4.4	6.2
2025	3.6	3.3	2.4	2.2	3.3	5.5	2.2	3.6	5.0	9.0	3.3	6.0
2026	3.7	3.3	2.4	2.1	3.3	5.4	2.1	3.5	5.1	8.9	3.3	5.7
2027	3.8	3.3	2.4	2.1	3.4	5.4	2.1	3.4	6.4	9.9	4.0	6.2
2028	3.9	3.3	2.4	2.0	3.4	5.3	2.1	3.2	6.4	9.8	3.9	5.9
2029	4.0	3.3	2.3	1.9	3.4	5.3	2.0	3.1	6.4	9.7	3.8	5.7
2030	4.1	3.3	2.3	1.9	3.5	5.2	2.0	3.0	6.5	9.6	3.7	5.5
	63.0	66.0	46.8	50.6	71.3	102.8	55.5	77.4	141.8	152.4	110.7	109.7
		Net Present Benefit		**3.8**	**Net Present Benefit**			**21.8**	**Net Present Benefit**			**-1.1**
			NPB Ratio	1.08		**BEST**	NPB Ratio	**1.39**			NPB Ratio	0.99

This table uses a 10% discount rate. The previous table uses a 3% discount rate.													
Cost and Benefits are in Millions of Dollars and Refer to the Three Localities Only													
	Maintain County Jails					**Expand County Jails**					**Construct Regional Jail**		
Fiscal Year	Costs	Benefits	NPC	NPB		Costs	Benefits	NPC	NPB		Costs	Benefits	NPC	NPB
2011	1.8	3.3	1.8	3.3		1.8	3.3	1.8	3.3		1.0	0.0	1.0	0.0
2012	2.7	3.3	2.5	3.0		6.0	3.3	5.5	3.0		11.0	0.0	10.0	0.0
2013	2.4	3.3	2.2	3.0		6.0	3.3	5.5	3.0		11.0	0.0	10.0	0.0
2014	2.5	3.3	2.3	3.0		6.0	3.3	5.5	3.0		11.0	0.0	10.0	0.0
2015	2.6	3.3	2.4	3.0		3.0	6.0	2.7	5.5		8.3	10.0	7.5	9.1
2016	2.7	3.3	2.5	3.0		3.0	5.9	2.7	5.4		8.3	9.9	7.5	9.0
2017	2.8	3.3	2.5	3.0		3.0	5.9	2.7	5.4		8.3	9.8	7.5	8.9
2018	2.9	3.3	2.6	3.0		3.1	5.8	2.8	5.3		8.4	9.7	7.6	8.8
2019	3.0	3.3	2.7	3.0		3.1	5.8	2.8	5.3		6.4	9.6	5.8	8.7
2020	3.1	3.3	2.8	3.0		3.1	5.7	2.8	5.2		6.4	9.5	5.8	8.6
2021	3.2	3.3	2.9	3.0		3.2	5.7	2.9	5.2		6.4	9.4	5.8	8.5
2022	3.3	3.3	3.0	3.0		3.2	5.6	2.9	5.1		6.5	9.3	5.9	8.5
2023	3.4	3.3	3.1	3.0		3.2	5.6	2.9	5.1		6.5	9.2	5.9	8.4
2024	3.5	3.3	3.2	3.0		3.3	5.5	3.0	5.0		6.5	9.1	5.9	8.3
2025	3.6	3.3	3.3	3.0		3.3	5.5	3.0	5.0		5.0	9.0	4.5	8.2
2026	3.7	3.3	3.4	3.0		3.3	5.4	3.0	4.9		5.1	8.9	4.6	8.1
2027	3.8	3.3	3.5	3.0		3.4	5.4	3.1	4.9		6.4	9.9	5.8	9.0
2028	3.9	3.3	3.5	3.0		3.4	5.3	3.1	4.8		6.4	9.8	5.8	8.9
2029	4.0	3.3	3.6	3.0		3.4	5.3	3.1	4.8		6.4	9.7	5.8	8.8
2030	4.1	3.3	3.7	3.0		3.5	5.2	3.2	4.7		6.5	9.6	5.9	8.7
	63.0	66.0	57.4	60.3		71.3	102.8	65.0	93.8		141.8	152.4	129.0	138.5
		Net Present Benefit		**2.9**		**Net Present Benefit**			**28.8**		**Net Present Benefit**			**9.5**
			NPB Ratio	1.05		**BEST**	NPB Ratio		**1.44**			NPB Ratio		1.07

References

Corrections, Virginia Department of. Annual Report of Board of Corrections: Approved Jail Projects. 2010. Available online at http://leg2.state.va.us/dls/h&sdocs.nsf/fc86c2b17a1cf388852570f9006f1299/abec568e800eada78525743b006e20ee/$FILE/RD63.pdf

Conover, Bruce. Email message to author. April 19, 2010.

de Socio, Robyn. *FY 2006 Jail Cost Report*. Report from the Compensation Board to the Virginia General Assembly. November 1, 2007. Available at http://www.scb.state.va.us/docs/fy06jailcostreport.pdf

---. *FY 2007 Jail Cost Report*. Report from the Compensation Board to the Virginia General Assembly. November 1, 2008. Available at http://www.scb.state.va.us/docs/fy07jailcostreport.pdf

---. *FY 2008 Jail Cost Report*. Report from the Compensation Board to the Virginia General Assembly. November 1, 2009. Available at http://www.scb.state.va.us/docs/fy08jailcostreport.pdf

---. *FY 2009 Jail Cost Report*. Report from the Compensation Board to the Virginia General Assembly. November 1, 2010. Available at http://www.scb.state.va.us/docs/fy09jailcostreport.pdf

Finkler, Allen. *Financial Management for Public, Health, and Not-for-Profit Organizations*. Pearson Education Inc. Upper Saddle River, NJ. 2010.

McEathron, Daniel. "Memo Re. FY 2011 Gang Task Force Funding." March 3, 2010. Available at http://wolf.house.gov/uploads/CONGRESSMANWOLFLTR2011GangTaskForceFunds%20(2).pdf.

Michal, R. Gregory. *Decision Tools for Budgetary Analysis.* Government Finance Officers Association. Chicago. 2001.

Orcutt, Ben. "Purchase of jail land finalized." *Northern Virginia Daily.* Strasburg, VA. September 4, 2010. Available at http://www.nvdaily.com/news/2010/09/purchase-of-jail-land-finalized.php.

---. "Warren County inmate dies days after attempted hanging." *Northern Virginia Daily.* Strasburg, VA. March 5, 2011. Available at http://www.nvdaily.com/news/2011/03/warren-county-inmate-dies-days-after-attempted-hanging.php.

Outlaw III, Linwood. "Authority approves new jail's architect." *Northern Virginia Daily.* Strasburg, VA. December 10, 2010. Available at http://www.nvdaily.com/news/2010/12/authority-approves-new-jails-architect.php.

Planning and Budget, Department of. *Governor's 2010 Reconvened Session Executive Amendments (House Bill 30).*Available at http://dpb.virginia.gov/forms/20100414-1%5CHB30ReconvenedAmendmentsFinal4-14.pdf.

Voth, Sally. "McDonnell Seeking to Salvage Funds for Jail." *Northern Virginia Daily.* Strasburg, VA. April 15, 2010. Available at http://www.nvdaily.com/news/2010/04/mcdonnell-seeking-to-salvage-funds-for-jail.php

The Flat Tax: An Analysis of America's Most Controversial Tax Reform Idea

Lane B. Teller

Abstract

Since its inception nearly a century ago, the federal income tax has experienced various waves of reform, each time government hoping to finally optimize its use. Dreams of a simplified, flat rate structure have intrigued lawmakers for years, and with the same set of issue champions again lobbying for its use, calls for reform enter the policy debate. This paper examines the merits of a proposed flat tax, starting with a brief history of the federal income tax in the U.S., then moving to a review of the basic premise for a flat rate structure and the Hall-Rabushka framework, and concluding with a critical analysis across the competing objectives of equity, efficiency, yield, cost, and feasibility. As a concept, the flat tax is impressive. As practical policy, however, it leaves much to be desired. Its proposed simplicity must be met with great scrutiny, as it remains to be seen whether such an untried system can function exactly as theorized.

INTRODUCTION

The federal tax system exhibits a level of complexity so great that a call for reform yields more bipartisan support than almost any other issue facing policymakers today. Regulatory uncertainty and stubbornly high unemployment have overpowered record levels of government spending, leaving Americans with an expanding budget deficit and mounting debt in the midst of prolonged economic stagnation.[1,2] Given public concerns over increasing costs and levels of spending, income tax reform as a relief mechanism for both taxpayers and government should be rising to the top of the policy priority list. Instead, proposals for reform have floundered in Congress, and voter salience is less now than when similar proposals were introduced during better economic conditions of the past. This counterintuitive environment exists because, for many, the argument for tax reform has dwindled down to a debate between keeping the current structure or moving to an alternative flat rate system.

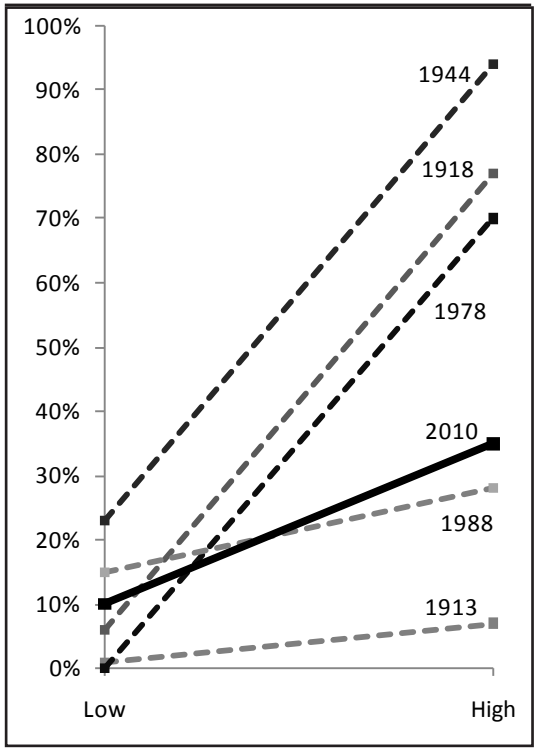
The great flat rate renaissance of the 1980s enjoys revival every few years, with the same loyal following of fiscal conservatives leading the charge today. However, the "trial run" afforded by the Tax Reform Act of 1986 did little other than to reinforce America's love affair with exceptions to the rule, and hope for a real flat income tax looks equally naive as it did when the concept came to prominence thirty years ago. This paper is an analysis of a proposed flat federal income tax, specifically, and not a national sales tax. First I examine a brief history of the federal income tax in the U.S., including varying progressivity over time and the relative flatness already embedded in today's structure. Second will be a review of the basic merits for a flat rate structure and the Hall-Rabushka framework, upon which most proposals today are modeled. Finally, I will conclude with a critical analysis of the flat tax across the competing objectives of equity, efficiency, yield, cost, and feasibility.

A BRIEF HISTORY

In the United States, the individual income tax is levied predominately at the national level and is by far the largest taxpayer liability. Like the federal government itself, it stayed relatively dormant until the 20th Century, after which point a progressive movement and two world wars ushered in the administrative state of American government. Since the ratification of the 16th Amendment to the Constitution, which gave Congress the power to collect taxes on income earned irrespective of apportionment across the states, debate has existed over the merits of how best to levy the income tax.

1 "Minutes of the Federal Open Market Committee Meeting." *Federal Reserve.* November 2, 2010. Accessed November 25, 2010, http://federalreserve.gov/monetarypolicy/files/fomcminutes20101103.pdf.
2 "Presentation to the Forecasters Club." *Congressional Budget Office.* October 27, 2010, accessed November 20, 2010, http://cbo.gov/ftpdocs/119xx/doc11948/10-27-2010-ForecastersClub.pdf.

Figure 1: PIT Rate Curves



Source: Historical data provided by the Tax Foundation

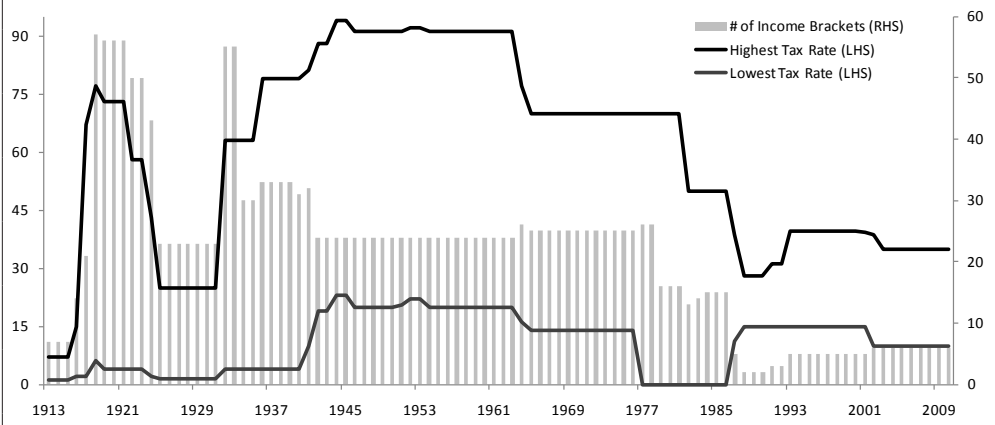
Tax Rate Curves and Brackets

Historically, it is the ability to pay - regardless of the individual's benefit received from government - spending that drives income tax policy. This principle states that the tax levied should be in proportion to the ability of each individual to pay the tax, meaning the largest nominal burden should fall on the largest earners of income.[3] Accepted by economists across the political spectrum, this is the foundation for both American income tax and the flat rate structure. When implemented against the backdrop of severe class inequality and the responding New Deal Era under President Roosevelt, however, the federal income tax structure adjusted for greater progressivity in order to ensure the wealthiest Americans carried the largest nominal *and* real tax burden. This degree of progressivity can be seen through the steepness of the tax rate curve, generically defined here as the slope between the lowest and highest tax rate brackets. Figure 1 depicts the "rate curve" of the federal personal income tax at six points in time: 1913, when the tax was first implemented; 1918, during World War I; 1944, during World War II; 1978, just ahead of the reform movement; 1988, after the implementation of the Tax Reform Act of 1986 (TRA); and today. Figure 1 illustrates how the federal income tax has been trending towards a flat rate structure for a long time. Today's

3 Ronald C. Fisher, *State and Local Public Finance* [Mason, Ohio: Thomson Higher Education, 2007].

curve is significantly more "flat" as a result of tax reform during the 1980s and the temporary tax cuts passed in 2001 and 2003. For example, in 1944, the difference between the highest bracket and the lowest bracket was 71 percent (23.0% - 94.0%). This represents a significant policy effort during the Second World War to increase the burden on the highest income earners for funding government. Conversely, in 1988, the difference between the highest and lowest brackets was just thirteen percent (15.0% - 28.0%) after TRA drastically simplified the structure and consolidated the income tax into two brackets.

Figure 2: Historical Federal Individual Income Tax Rates (1913-2009)



Source: Historical data provided by the Tax Foundation (www.taxfoundation.org)

A second way to study the evolution of the federal income tax is through an analysis of the number of brackets utilized to assess income earners. Figure 2 shows the variation in the number of tax brackets (and the corresponding high and low rates) over time. The number of brackets ranges from as many as 57 during WWI to as few as two after TRA.[4,5] Currently, under the temporary cuts of 2001 and 2003, there are six different brackets, ranging from a low of ten percent to a high of 35 percent.[6]

Going Flat

The rapid growth of the federal budget during the first half of the 20th Century led Congress to increase income tax rates several times, with the number of brackets and the introduction of exemptions seen as the primary tool for delivering fairness in the tax. Since the

4 Holley Ulbrich, "Flat Tax is Class Warfare." *U.S. News*, April 12, 2010, accessed November 24, 2010, http://politics.usnews.com/opinion/articles/2010/04/12/flat-tax-is-class-warfare.html.

5 "History of the U.S. Tax System." *U.S. Department of the Treasury.* August 2003. Accessed November 29, 2010, http://www.treas.gov/education/fact-sheets/taxes/ustax.shtml.

6 The income tax rates established under the *The Economic Growth and Tax Relief Reconciliation Act of 2001* and the *Jobs and Growth Tax Relief Reconciliation Act of 2003* (the "Bush Tax Cuts") were set to expire on December 31st, 2010, but were extended for another two years through the *Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010*.

1980s, however, there has been a considerable shift in favor of a simplified, more flat structure. When President Reagan came into office, the country was experiencing high unemployment and hyperinflation. A growing conservative ideology in favor of smaller government gave birth to calls for serious alteration to the American tax system, which many saw as an excellent way to unleash free market principles and improve the overall economy.

In December of 1981, economists Robert Hall and Alvin Rabushka wrote an op-ed in the *Wall Street Journal* proposing a replacement of the federal income tax with a "low, simple, flat tax."[7] It was here that Hall and Rabushka first coined the now-famous idea of a "postcard" tax return. (Meant to serve as little more than an illustration for the simplicity of their proposal, the postcard concept has since been billed as a viable return format with a flat tax.) Support for the Hall-Rabushka flat tax quickly gained momentum, and in 1984, the Department of the Treasury issued a report to the President entitled *Tax Reform for Fairness, Simplicity, and Economic Growth*.[8,9] In the report, the Treasury laid out the merits of various options and recommended a modified version of the flat tax:

> *In order to simplify and reform the existing income tax, but avoid the massive redistribution of tax liabilities of a pure flat tax…(Treasury) proposes a modified flat tax on income be enacted…By combining a more comprehensive definition of income than under current law with modestly graduated low rates, modified flat tax proposals are able to achieve gains in simplicity, economic neutrality, equal tax treatment of families with equal incomes, and economic growth, without sacrificing distributional equity.*[10]

The Treasury's report served as a major catalyst for TRA, which collapsed the income tax from 15 brackets into two and narrowed the range in rates from 50 percent (0.0% - 50.0%) to 13 percent (15.0% - 28.0%). In addition to this flattening, TRA aimed at eliminating shelters embedded in the tax code and unwinding the growing influence of special interests in tax policy.[11]

Despite its legacy as the most significant reform effort to the federal tax system, TRA enjoyed only a short honeymoon, and Congress was soon under pressure to tweak the structure in favor of more exemptions to the base. In this respect, the legislation served mainly as a "defragmenting" of the tax system, providing a clean foundation for rebuilding the same policies. As of 2006, there had been more than 15,000 changes to the law, returning many of the loopholes eliminated in 1986.[12] By 1993, the income tax expanded from two brackets to five,

7 Robert E. Hall and Alvin Rabushka, *The Flat Tax.*[Stanford, California: Hoover Institution, 2007], 2.
8 Donald T. Regan, *Tax Reform for Fairness, Simplicity, and Economic Growth*. Office of the Secretary of Treasury, Washington, DC: United States Department of the Treasury, (1984).
9 A copy of this report is available on Treasury's website under archives of the Office of Tax Policy, http://www.treasury.gov/offices/tax-policy/library/tax-reform/.
10 Regan, 47.
11 Andrew Chamberlain, "Twenty Years Later: The Tax Reform Act of 1986." *Tax Foundation,* October 23, 2006. Accessed November 26, 2010, http://www.taxfoundation.org/blog/show/1951.html.
12 Jeffrey Birnbaum, "Taxing Lessons, 20 Years in the Making." *The Washinton Post.* October 23, 2006. Accessed November 26, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2006/10/20/AR2006102001255.html.

with the range steepening to 24.6 percent (15.0% - 39.6%).

Flat Tax and the Budget

The increase in taxes during the early 1990s, combined with a prolonged economic expansion, produced a budget surplus of $281 billion in 2000, and cumulative projected surpluses of $5.6 trillion over the next ten years.[13] Despite the excellent opportunity to pay down public debt afforded by a surplus, tax rates (and revenues) dropped dramatically under President George W. Bush as part of a broader conservative return to support of the flat tax proposals first made under President Reagan.

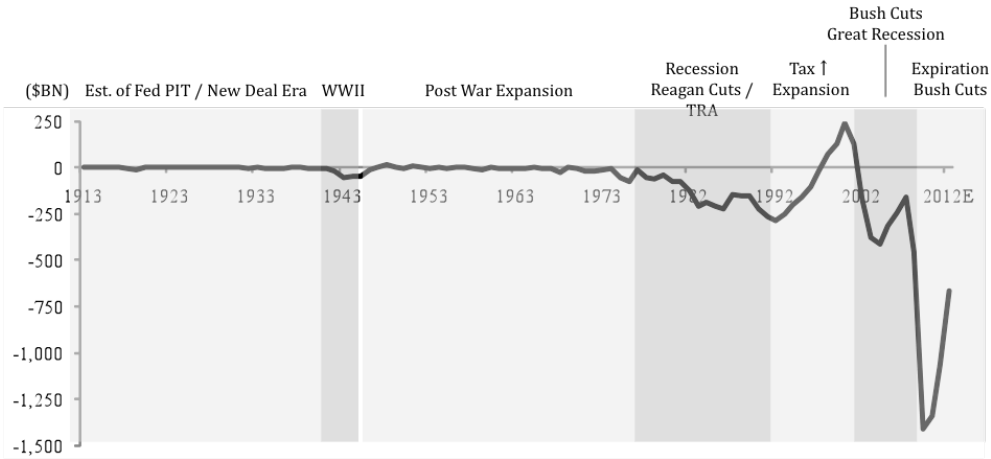
The Bush tax cuts of 2001 and 2003, combined with a significant increase in defense spending and a severe recession in 2008, quickly erased projections of a long-term surplus. In 2004, the federal budget ran a $412 billion deficit and by 2009, that deficit ballooned to $1.4 trillion on the heels of a deep recession and significant spending to prop up the financial sector and stimulate the economy.[14] Figure 3 tracks the balance of the federal budget since enactment of the personal income tax, with forecasted deficit levels included for 2010-2012.[15] The most severe deficits accompany efforts in the 1980s and in this past decade to flatten the tax curve. This is because the federal budget often expands in size but rarely contracts, and those same time periods were stricken with downturns in the economy and shrinking tax revenue, putting the budget under greater pressure. Conversely, the temporary surplus from 1998-2001 came after tax increases in the early 1990s that steepened the tax curve and increased progressivity ahead of a major economic expansion, growing tax revenue significantly by the end of the decade.

13 "History of the U.S. Tax System."

14 The Troubled Asset Relief Program, as part of the Emergency Economic Stabilization Act of 2008, and the American Recovery and Reinvestment Act of 2009 combined to authorize over $1.5 trillion in government spending.

15 Projected budget Deficits and Surpluses are updated periodically for the Congressional Budget Office's baseline forecasts and can be accessed at www.cbo.gov.

Figure 3: Historical Federal Budget Balance – Surplus/Deficits (1913-2012)



Source: Historical data from the Office of Management and Budget, 2010-2012 estimates from the Congressional Budget Office

The point here is not to suggest a flat tax leads to a budget deficit, but it should be obvious that a flat tax will not create a budget surplus either, at least not without considering other factors like the natural business cycle and government spending. This is an important observation because improving the federal budget is an underlying objective of flat tax proponents, an objective that does not appear to be met simply by changing the tax structure.

THE CASE FOR A FLAT TAX

The numerous tax brackets that characterized policy through the 1970s basically ensured a step up in relative liability for even just a few thousand dollars of additional income. Over time, this complexity, combined with the growing number of deductions, led to a reevaluation by policymakers in order to simplify the administrative process of collection and to relieve some the burden on higher income earners, which many perceived to be a major hindrance to growth. The flat tax is a direct outcome of this reevaluation. In conjunction with the broader *New Federalism* and *New Public Management* movement that swept through public administration and politics during the 1980s, the flat tax was offered up as an alternative free of the bureaucracy and inefficiency that had long plagued government programs. Like many other initiatives to form government policy in the shape of private sector best practices, the flat tax stems from one principal objective to simplify the process. With that idea in mind, there are five advantages most often cited in support of a flat rate income tax, discussed below.

Compliance. The current tax structure infamously endures significant compliance costs for both government and taxpayers. For individuals and businesses, the estimated cost of tax preparation and the use of lawyers, accountants, and other resources, is six billion hours and

over $250 billion annually.[16] For government, the cost of collection (operating) is approximately $11 billion, or fifty cents for every $100 collected.[17] However, this pales in comparison to the revenue lost from the tax gap (uncollected liabilities), which runs at approximately $300 billion annually, or 10-15% of total revenue collected.[18] The flat tax aims to eliminate many of these administrative costs by drastically reducing the number of deductions and exceptions and in turn providing greater transparency for the liability of each taxpayer.

Single taxation. A primary goal of the flat tax is to ensure that income is only taxed once. Under the current system, it is argued, certain streams are taxed more than once. Estate and capital gains, for example, are presumed to be forms of double taxation.[19] For estate taxes, the wealth created over time is taxed initially when it is earned and then again when it is passed on to an heir. Capital gains (profits from securities purchased) are taxed initially as corporate earnings and then again as income earned on investment for individuals. The Flat tax eliminates any need for estate or capital gains taxation because it is modeled under the idea of taxing only consumption (income minus investment) and only at the origin of the income earned – by an individual or a business, but not both.[20]

Fairness. Proponents of the flat tax argue the current system exhibits a level of progressivity that overburdens higher income earners. Not only does this (theoretically) stifle growth by mitigating the incentive to earn more in wages; it is not fair either. By establishing one rate bracket, the flat tax ensures that each individual payer incurs a liability proportional to his or her income earned.[21,22] In this regard, the flat tax still adheres to the ability to pay principle because the highest income earners will carry the highest absolute (dollar amount) tax burden.

Global Competitiveness. The United States has one of the highest corporate income tax rates in the world, and free market economists argue it serves as a hindrance to domestic growth by deterring investment to less-taxed markets. A flat rate, which is likely to be half of current personal and corporate rates, is seen as a tool for increasing the global competitiveness of the U.S. marketplace and as a catalyst for growth through increased investment. Adding to this argument is the increasing use of the flat tax by developing countries, particularly the eastern bloc of former Soviet Union and Yugoslavian member states. Since 1994, 21 nations have enacted a flat rate tax structure, including eight former members of the Soviet

16 Scott Moody, Wendy P. Warcholik, and Scott A. Hodge, "The Risng Cost of Complying with the Federal Income Tax", *Tax Foundation* [Washington, DC: Tax Foundation, 2005].
17 "Statistics of Income Division." *Internal Revenue Service.* November 27, 2010. Accessed November 27, 2010, http://www.irs.gov/taxstats/compliancestats/article/0,,id=132165,00.html.
18 "Update on Reducing the Federal Tax Gap and Improving Voluntary Compliance." U.S. Department of the Treasury. July 2009. Accessed November 28, 2010, http://www.irs.gov/pub/newsroom/tax_gap_report_-final_version.pdf.
19 Daniel J. Mitchell, "Eliminate Tax Brackets and Complicated Forms with a Flat Tax," *US News*, April 12, 2010. Accessed November 24, 2010, http://politics.usnews.com/opinion/articles/2010/04/12/eliminate-tax-brackets-and-complicated-forms-with-a-flat-tax.html.
20 Hall and Rabushka.
21 Daniel J. Mitchell, "A Brief Guide to the Flat Tax," *Backgrounder, 1866*(July 2005).
22 Steve Forbes, *Flat Tax Revolution: Using a Postcard to Abolish the IRS* [Washington, DC: Regnery Publishing, 2005].

Union, five of Yugoslavia, and seven that are now members of the European Union.[23,24,25,26]

Special interests. Arguably the most bipartisan argument for the flat tax is the opportunity it provides for stripping the tax code of loopholes that potentially favor special interests. By erasing the use of deductions, credits, and exemptions, the flat tax can mitigate the influence of interest groups and lobbyists largely blamed for the growing complexity of the tax code.[27] This would also fall in line with goals for lower compliance costs and fairness.

THE FLAT TAX PLAN

Like many policy areas, tax reform oscillates in and out of priority for policy analysts and lawmakers. The flat tax, in particular, has enjoyed various waves of reprisal over the last thirty years, gaining steam ahead of TRA in the early 1980s, then again behind former House Majority Leader Dick Armey (R-TX) and billionaire businessman Steve Forbes during the 1990s. Lately, advocacy for a flat tax is usually drowned out by louder calls for additional tax breaks to support struggling individuals and small businesses. However, today's tax code remains as complex as ever before, and as Congress addresses the expiring tax cuts of 2001 and 2003 and the White House moves forward with proposals to shrink the deficit and bring down government spending, the flat tax is sure to come back into play, particularly with free market economists and fiscal conservatives who have supported it all along. Robert Hall and Alvin Rabushka, both fellows at the Hoover Institution, a conservative think tank at Stanford University, have produced the most detailed roadmap for implementing a flat tax in the United States. Their plan forms the outline for almost every proposal lobbied for or introduced in Congress within the last twenty years. An overview of their plan serves well in framing the flat tax debate.

The Hall-Rabushka Framework

First proposed in 1981, the authors still spend countless hours advocating (and defending) the merits of the flat rate structure, and have produced a handy 200 page guidebook, simply titled *The Flat Tax*. The basic premise of their plan is to simplify the system, so much so that an entire tax liability is recorded on a form the size of a postcard. Specifically, Hall and Rabushka propose splitting the income universe into only two categories, individuals and businesses, taxing both at 19 percent, and structuring the code to ensure each dollar of income is taxed just once and as close as possible to its source. Their argument is simple: whenever different forms of income are taxed at different rates, the public figures out how to take advantage of the differential and takes deductions to the highest available rate while reporting income at the lowest rate.[28]

23 Daniel J. Mitchell, "The Global Flat Tax Revolution." *Cato Policy Report 29*(4).
24 European Commission, *Monitoring Tax Revenues and Tax Reforms in EU Member States.* Directorate General Economic and Financial Affairs, Brussels, BE: European Commission, 2010.
25 European Commission, *Tax Revenues in the European Union: Recent trends and challenges ahead.* Directorate General Economic and Financial Affairs, European Commission, Brussels, BE: European Commission, 2007.
26 The Current European Union member states with flat tax: Estonia, Slovakia, Czech Republic, Bulgaria, Latvia, Lithuania, and Romania.
27 Daniel J. Mitchell, "A Brief Guide to the Flat Tax."
28 Hall and Rabushka, 80.

Individual Income Tax. Understanding the Hall-Rabushka plan requires a return to the argument for progressivity in the tax system. A pure flat tax, where every citizen pays an equally proportioned amount of his or her earned income, is generally considered to be regressive because the liability on lower income earners represents a much larger percentage of consumption spending than the liability on higher income earners who have more disposable income. For this reason, the Hall-Rabushka plan, like most proposals, is actually a modified flat tax with basic exemptions included to relieve the burden on the lowest income earners and provide some progressivity to the tax overall. In their model, each individual wage earner is taxed at the flat rate of 19 percent on all sources of income (i.e. wages, salaries, and retirement benefits), but only after deduction for a personal allowance (e.g. $25,500 for a family of four in 1995). This allowance threshold is designed to minimize (or eliminate) the initial burden on wage earners to the point that only the highest earners actually pay the full 19 percent. Unlike the current structure, which utilizes a higher statutory rate and provides progressivity through numerous deductions and credits, the Hall-Rabushka plan aims at providing some basic progressivity but then yielding greater overall benefit through simplification. This simplicity comes from the plan's integration with the other subset of the tax system: business.

Business Income Tax. As part of the overarching goal to ensure all income is taxed but taxed only once, the Hall-Rabushka plan is supposed to be "airtight" because of the identical rate for individual or business income, eliminating potential gaming between the two, and because every form of income must be classified in one of two buckets. The underlying logic offered by Hall and Rabushka is that the public can only do one of two things with income, spend it or invest it, and taxing consumption (measured as income less investment) is the best way to capture that income without hindering growth.

Specifically, the business tax is designed to tax all income earned by a firm (less wages paid, because those will be taxed on the individual) and investment in plant and equipment.[29] According to Hall and Rabushka, "The business tax is a giant, comprehensive withholding tax on all types of income other than wages, salaries, and pensions. It is carefully designed to tax every bit of income outside of wages but to tax it only once."[30] This characteristic is understood best through the consideration for return on investment. Under a flat tax, there is no deduction for interest paid out, meaning that investment will effectively be taxed through the operating income of the firm. As a result, taxing interest earned through return on investment is unnecessary because it would be double taxation. Therefore, a central component to the Hall-Rabushka proposal is the elimination of tax on capital gains.

A second radical element to the business tax proposal is the elimination of the deduction for depreciation of plant, property, and equipment. Instead, Hall and Rabushka recommend firms completely expense investment spending in the year incurred. This, they argue, would be much simpler than the accounting mechanism of depreciating assets over time. While this would produce a negative liability for start-ups that are investing heavily and earning little,

29 *Ibid.*, 83.
30 *Ibid.*, 92.

Hall and Rabushka believe this can be easily managed by allowing firms to carry that negative liability forward as a credit to future taxation.[31]

Hall and Rabushka also tackle the issue of fringe benefits, which are a major form of compensation but for the most part ignored under the current system. The problem with fringe benefits is that there is no logical reason for their popularity other than serving as write-offs for employers and being tax-free for employees. This arbitrariness, Hall and Rabushka argue, creates inefficiencies in the economy because employers serve as an unnecessary intermediary in the purchasing of consumer services like health insurance, transportation, club memberships, etc. If fringe benefits were valued (taxed) identical to wages earned, employees would opt for the cash in hand, rather than the benefit, enabling them with more control over services used.[32]

The examples identified above are supported by numerous other tweaks in the spirit of a flat rate system, each of which is designed to minimize the financial and administrative burden on American taxpayers. Whether or not they are as effective in practice as in theory remains to be seen. Nevertheless, the Hall-Rabushka plan is treated like gospel among free market economists and fiscal conservatives.

31 *Ibid.*, 97.
32 *Ibid.*, 96.

Figure 4: Notable Flat Tax-Related Proposed Legislation

- **Freedom and Fairness Restoration Act**
  Rep. Armey (R-TX); Sen. Shelby (R-AL)
  Introduced four times between 1994 and 2001
- **Flat Fair Tax**
  Sen. Helms (R-NC) in 1995, Sen. Specter (R-PA) 1997-09
  Introduced seven times between 1995 and 2009
- **Freedom Flat Tax**
  Rep. Burgess (R-TX)
  Introduced four times between 2003 and 2009
- **Tax Simplification Act**
  Rep. Smith (R-MI)
  Introduced three times between 2003 and 2007
- **Optional One Page Flat Tax Act**
  Sen. Alexander (R-TN)
  Introduced in 2007 and in 2009
- **Fair Tax Act**
  Rep. Linder (R-GA)
  Introduced in January 2009, Referred to Ways & Means
- **Simplified, Manageable, and Responsible Act**
  Sen. Shelby (R-AL)
  Introduced in April 2009, referred to Finance
- **Tax Code Termination Act**
  Sen. Isakson (R-GA)
  Introduced in February 2010, referred to Finance
- **Bipartisan Tax Fairness and Simplification Act**
  Sen. Wyden (D-OR) and Sen. Greg (R-NH)
  Introduced in February 2010, referred to Finance

Source: Thomas.gov

FLAT TAX POLICY

Since the full implementation of TRA in 1988, there have been more than fifty bills introduced in the House and Senate proposing some iteration of a flat tax. Virtually none have made it out of Committee. Listed in Figure 4 are some of the more notable pieces of legislation and the flat tax champions sponsoring each bill. Armey's famous *Freedom and Fairness Restoration Act* stirred up a lot of debate but in the end was little more than a political tool used to push the Republican agenda during the 1990s. Now retired from Congress, Armey still promotes his flat tax plan through the libertarian think tank Freedom Works.[33] Sen. Arlen Specter (D-PA) introduced the *Flat Fair Tax Act* during eight Congresses in a row, dating back to 1995. In 2003, he successfully added an amendment to the proposed tax cuts that led to a hearing with the Joint Economic Committee regarding the merits of a flat tax.[34] Less than a month after introducing the bill again in 2009, he switched political parties after

33 "Dick Armey on the Flat Tax." Freedom Works. November 27, 2010. Accessed November 27, 2010, http://www.freedomworks.org/issues/flat-tax.

34 "Senator Specter Introduces 'Flat Tax Act of 2009'." Senator Arlen Specter. March 30, 2009. Accessed November 28, 2010, http://specter.senate.gov/public/index.cfm?FuseAction=NewsRoom.NewsReleases&ContentRecord_id=5988e4d0-eb43-e40d-b3b4-cabcefddae23.

44 years as a Republican. He went on to lose the Democratic primary in 2010. In addition to Sen. Specter's proposed bill, there were five others offered during the 111th Congress, each of which died in committee. Certainly, one can expect new versions of these bills to be introduced in the 112th Congress.

ANALYSIS

Having laid out a brief historical summary of federal income taxes in the U.S., reviewed the arguments for a flat rate system and the nuts and bolts of the Hall-Rabushka proposal, it is important now to discuss the major concerns of the flat tax in an effort to assess its viability as real reform. An excellent way to conduct this analysis is by judging the flat tax against the five primary criteria of good tax policy: equity, efficiency, revenue yield, administrative cost, and political feasibility.[35]

Equity

A common buzzword attached to the flat tax is the "fair tax" because the equal proportionality associated with a single rate is assumed to be fairer than a progressive tax that penalizes wealth creation by overburdening higher income earners. This rationale alone makes little sense. As discussed previously, a pure flat tax will be regressive because of the relative burden placed on lower income earners with less disposable income. The proposals modeled after Hall-Rabushka are not pure flat tax systems; rather, they are modified versions to include progressivity by offering allowances that mitigate the burden on the low levels of income. This is a positive aspect of the flat tax and probably the strongest argument in defense of its equity consideration.

However, relative to the current tax system, there is no denying that the flat tax serves as a major break for higher income earners. Most observers studying the flat tax agree it likely will create a windfall for the wealthiest taxpayers, with the relative burden shifted to middle and lower income taxpayers.[36,37] This is for two main reasons. First, while there are numerous loopholes exploited by wealthier taxpayers, a significant number of current deductions, exemptions, and credits are targeted at lower income earners. The elimination of tax breaks is likely to impact lower income earners more severely than any other class. Second, the wealthy will benefit the most from a change in the statutory rate. For example, a flat rate of 20 percent creates a savings of 15 percent for individuals currently taxed at the highest 35 percent bracket, and doubles the current 10 percent rate charged to the lowest bracket. Large allowances will go a long way towards mitigating any increase in the liabilities of lower income earners, but the actual savings is likely to be experienced only by higher income brackets.

A second equity consideration is the degree to which the flat tax will increase fairness by eliminating loopholes created by special interests, particularly business interests. This is an

35 Daniel R. Mullins, "Local Fiscal Resources: The Basics of a Meaningful Resource Structure," in *Managing Muncipal Change*, by C. F. Bosner [Bloomington, IN: School of Public and Environmental Affairs, 1994].
36 Holley Ulbrich, "Why We Don't Need a Flat Tax." *Strom Thurman Institute of Government and Public Affairs,* 1998. Accessed November 24, 2010, http://www.strom.clemson.edu/opinion/ulbrich/flatax2.html.
37 Amy Dunbar and Thomas Pogue, "Estimating Flat Tax Incidence and Yield: A Sensitivity Analysis." *National Tax Journal 51*(2): 303-321.

admirable improvement over the current tax system, particularly if it can eliminate exemptions that provide no real value other than to create inefficiencies from unnecessary gaming of the code. However, relevant to the argument that a flat rate system will silence corporate lobbyists is the reality that numerous provisions designed to benefit lower class Americans will be eliminated as well. This will have a significant impact on equity, including disruptive effects that will come with the elimination of deductions for pension benefits, employer-provided healthcare, mortgage interest, property taxes, and charitable contributions.[38]

These concerns are important to appreciate when weighing the flat tax because its benefits are not free; there will be a trade off paid for by certain subsets of the population. Overall, the equity effect of a flat tax is likely to be poor. The personal allowances included in most proposals will provide some valuable progressivity, but the short-term shock from eliminating equity-induced provisions of the current system could have a severe impact on the lower class.

Efficiency

Will a flat rate structure make the U.S. tax system better off? The answer to this question is the bottom-line for many Americans. Unfortunately, that answer is just as disputed as the equity argument. In the spirit of simplification, the "airtight" moniker for the Hall-Rabushka flat tax implies significant efficiencies will be realized from a tax that is transparent, utilizes one rate, and ensures all income is taxed just once. Each of these traits, if fully realized, will certainly increase efficiency in the system. However, the flat income tax is a relatively untested structure, particularly on a scale as large as that of the United States.

If any holes are found in this "airtight" system, the flat tax will be quickly downgraded to just an alternative, and not an improvement, to the current system. With that said, there are some red flags raising concerns over the functionality of the flat tax in the long run. For example, a major selling point for the business tax is the abolition of amortization of capital expenditures (investment) in favor of immediate write-offs, as with other general business expenses. This is meant to simplify the controversial process of depreciating assets over time, which can have a major impact on the accounting for paper profit and loss. As mentioned previously, when capital investment is completely expensed upfront, firms are more likely to report negative earnings. When this happens, the Hall-Rabushka plan recommends carrying the negative tax liability forward as credit on future income taxes. This sounds reasonable. It also sounds like the same kind of accounting principles that make deprecation so problematic (both formats carry forward effect of investment purchases into future years). This is just one example of why it is important to respect the complexity of the current tax system. Certainly, there are numerous provisions to the tax code that are frivolous, but there are a significant amount that serve a clear purpose too. In other words, throwing out the rule book most likely will lead to new rules, not the absence of rules.

There is a long list of other side effects to the flat tax which are likely to make the new

38 Holley Ulbrich, "Flat Tax is Class Warfare" *U.S. News*, April 12, 2010. Accessed November 24, 2010, http://politics.usnews.com/opinion/articles/2010/04/12/flat-tax-is-class-warfare.html.

system just as complicated in the long run. These include the distinction between business and individual income for sole proprietorships, tangible versus intangible inputs to business, fringe benefits versus general expenses, and the accounting for income not classified as wages or capital gains (e.g. alimony payments, loan forgiveness, and prize winnings).[39] Overall, the efficiency of a flat tax remains suspect. As with the Tax Reform Act of 1986, any plan capable of making it through Congress is likely to serve more as a rebuilding process to the current tax code than as real reform to the system.

Revenue Yield

Generally speaking, most flat tax proposals are offered as revenue neutral to the current budget. In fact, the exact rate recommended (e.g. 19%) typically comes from a calculation of what will be necessary to meet current revenue projections. Furthermore, supply side economists argue that lower taxes will promote investment, create growth, and stimulate the economy, which will, in turn, increase tax revenues. Dale Jorgensen, a political economics professor at Harvard University, estimates that real reform through a flat tax could lead to wealth creation of almost $5 trillion, a pot of money large enough to yield significant additional tax revenue.[40,41]

To the degree that this estimate is accurate, a flat tax may serve quite well in creating additional yield for the government. However, Jorgensen's estimate, and many others like it, stems primarily from the theory that workers unbounded from the constraints of different tax brackets will discover new motivation to earn more. This was a big part of the rationale behind consolidation of the bracket-heavy structures that characterized federal income taxes prior to 1980. As Figure 3 suggests, supply side economics did little to reign in the federal budget or to create wealth for the middle and lower class (implied by the growing federal budget). If a flat tax is implemented without regard for government spending, then even a significant increase in revenue yield may do little to improve the net impact to the federal budget. (This is particularly likely if previous breaks are merely transitioned into government programs.)

Typically, lowering the income tax rate while simultaneously widening the base can be a good method for generating revenue. However, the flat tax lowers the rate for higher income earners and widens the base to include more lower income earners. From a revenue standpoint, this is likely to be counterproductive because the loss from a lower rate could be significantly more than the gain from a wider base. In this manner, a flat tax is likely to score poorly at generating revenue yield. Not only will the immediate impact be a loss in revenue because it will take time for supply side stimulus to impact the economy, the likelihood for greater government spending means budget deficits will increase as well.

Administrative Cost

Simplification is the backbone of the flat tax. From a purely administrative standpoint, a clearer understanding of tax liabilities will go a long way toward shrinking the tax gap and

39 Alan L. Feld, "Living with the Flat Tax," *National Tax Journal 48*(4).
40 Dale Jorgenson, "Efficient Taxation of Income," *Harvard Magazine*, (March-April 2003): 31-33.
41 Daniel J. Mitchell, "A Brief Guide to the Flat Tax."

the workload of the Internal Revenue Service. If a postcard return is in fact possible, then it is hard to argue with the administrative advantages to a flat tax. However, even the "postcard" examples offered by Hall and Rabushka, Armey, Specter, and Forbes require a lot more than just a mailing address. In relatively fine print, these postcards include line item deductions for personal allowances and adjustments for prior period tax carryovers. Is this drastically simpler than the current form? Of course. However, these draft proposals, no matter how refined, have yet to run the gauntlet of federal bureaucrats and special interests. Overall, it is fair to say a flat tax will provide some much-needed simplicity to the tax system; but it is not fair to say that simplicity will be sustainable, or even implementable.

Political/Legal Feasibility

As suggested by the number of flat tax bills gone nowhere in Congress, the political feasibility of dramatic income tax reform is quite low. For better or for worse, democracy in the United States is rooted in the right to organize, protest, and influence policy. This right is protected by the Constitution and exercised by the tens of thousands of lobbyists pushing special interests on legislators. Many of those interests are with the best of intentions; others are not. Unfortunately, discriminating between the two is impossible. Flat tax legislation, in particular, will have to survive the scrutiny of interest groups protecting favorable tax provisions, a test that no proposal has passed so far.

CONCLUSION

There are three certainties identified in this analysis: one, the federal income tax is increasingly complicated; two, the tax rate has flattened over time; and three, real reform is virtually impossible. The flat tax, as an idea, is impressive. As practical policy, it is a different story. The simplicity it offers is admirable, but the equity, efficiency, and yield considerations remain suspect. Each policy objective deserves great scrutiny and it would be dangerous to assume such an untried system can function exactly as theorized.

No doubt, aspects of the flat rate concept will continue to creep into the U.S. system, and to this end, it may eventually be presented in its full glory. For the time being, however, the flat tax serves best as a check on the direction of the current system. Like the Tax Reform Act of 1986, any tangible legislation is likely to serve as a maintenance tool for cleaning up the current code rather than a charter for a new way forward.

REFERENCES

Alm, James. "What is an "Optimal" Tax System?" *National Tax Journal, 49*(1): 117-131.

Birnbaum, Jeffrey. "Taxing Lessons, 20 Years in the Making." *The Washinton Post.* October 23, 2006. Accessed November 26, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2006/10/20/AR2006102001255.html.

Chamberlain, Andrew. "Twenty Years Later: The Tax Reform Act of 1986." Tax Foundation. October 23, 2006. Accessed November 26, 2010, http://www.taxfoundation.org/blog/show/1951.html.

"Dick Armey on the Flat tax." Freedom Works. November 27, 2010. Accessed November 27, 2010, http://www.freedomworks.org/issues/flat-tax.

Dunbar, Amy, and Thomas Pogue. "Estimating Flat Tax Incidence and Yield: A Sensitivity Analysis." *National Tax Journal* 51(2): 303-321.

European Commission. *Monitoring Tax Revenues and Tax Reforms in EU Member States.* Directorate General Economic and Financial Affairs. Brussels, BE: European Commission, 2010.

---. *Tax Revenues in the European Union: Recent Trends and Challenges Ahead.* Directorate General Economic and Financial Affairs. Brussels, BE: European Commission, 2007.

Feld, Alan L. "Living with the Flat Tax." *National Tax Journal 48*(4).

Fisher, Ronald C. *State and Local Public Finance.* Mason, Ohio: Thomson Higher Education, 2007.

Forbes, Steve. *Flat Tax Revolution: Using a Postcard to Abolish the IRS.* Washington, DC: Regnery Publishing, 2005.

Graetz, Michael J. *The Decline (and Fall?) of the Income Tax.* New York: WW Norton & Company, 1997.

Hall, Robert E., and Alvin Rabushka. *The Flat Tax.* Stanford, California: Hoover Institution, 2007.

"History of the U.S. Tax System." U.S. Department of the Treasury. August 2003. Accessed November 29, 2010, http://www.treas.gov/education/fact-sheets/taxes/ustax.shtml.

Jorgenson, Dale. "Efficient Taxation of Income." *Harvard Magazine,* March-April 2003: 31-33.

Kaplow, Louis. "How Tax Complexity and Enforcement Affect the Equity and Efficiency of the Income Tax." *National Tax Journal 49*(1): 135-147.

Keen, Michael, Yitae Kim, and Ricardo Varsano. "The "Flat Tax(es): Principles and Experience." *International Tax and Public Finance 15*(6): 712-751.

"Minutes of the Federal Open Market Committee Meeting." Federal Reserve. November 2, 2010. Accessed November 27, 2010, http://federalreserve.gov/monetarypolicy/files/fomcminutes20101103.pdf.

Mitchell, Daniel J. "Eliminate Tax Brackets and Complicated Forms with a Flat Tax." April 12, 2010. http://politics.usnews.com/opinion/articles/2010/04/12/eliminate-tax-brackets-and-complicated-forms-with-a-flat-tax.html.

---. "A Brief Guide to the Flat Tax." *Backgrounder (The Heritage Foundation),1866* (July 2005).

---. "The Global Flat Tax Revolution." *Cato Policy Report (Cato Institute) 29*(4).

Moody, Scott, Wendy P. Warcholik, and Scott A. Hodge. *The Risng Cost of Complying with the Federal Income Tax.* Washington, DC: Tax Foundation, 2005.

Moore, Stephen. "Bush's Stealth Flat Tax." *The Weekly Standard*, September 13, 2004.

Mullins, Daniel R. "Local Fiscal Resources: The Basics of a Meaningful Resource Structure." In *Managing Muncipal Change*, by C. F. Bosner. Bloomington, IN: School of Public and Environmental Affairs, 1994.

"Presentation to the Forecasters Club." Congressional Budget Office. October 27, 2010. Accessed November 20, 2010, http://cbo.gov/ftpdocs/119xx/doc11948/10-27-2010-ForecastersClub.pdf.

Regan, Donald T. *Tax Reform for Fairness, Simplicity, and Economic Growth.* Office of the Secretary, Washington, DC: United States Department of the Treasury, 1984.

"Senator Specter Introduces 'Flat Tax Act of 2009'." Senator Arlen Specter. March 30, 2009. Accessed November 28, 2010, http://specter.senate.gov/public/index.cfm?FuseAction=NewsRoom.NewsReleases&ContentRecord_id=5988e4d0-eb43-e40d-b3b4-cabcefddae23.

Slemrod, Joel. "The Role of Misconceptions in Support for Regressive Tax Reform." *National Tax Journal 59*(1): 57-74.

"Statistics of Income Division." Internal Revenue Service. November 27, 2010. Accessed November 27, 2010, http://www.irs.gov/taxstats/compliancestats/article/0,,id=132165,00.html.

Ulbrich, Holley. "Flat Tax is Class Warfare." U.S. News. April 12, 2010. Accessed November 24, 2010, http://politics.usnews.com/opinion/articles/2010/04/12/flat-tax-is-class-warfare.html.

---.. "Income Tax Day: Flat and Simple, or Fair and Complicated?" Strom Thurmond Institute of Government and Public Affairs. 2010. Accessed November 26, 2010, http://www.strom.clemson.edu/opinion/ulbrich/Income_Tax_Day.pdf.

---.. "Why We Don't Need a Flat Tax." Strom Thurman Institute of Government and Public Affairs. 1998. Accessed November 24, 2010, http://www.strom.clemson.edu/opinion/ulbrich/flatax2.html.

"Update on Reducing the Federal Tax Gap and Improving Voluntary Compliance." U.S. Department of the Treasury. July 2009. Accessed November 28, 2010, http://www.irs.gov/pub/newsroom/tax_gap_report_-final_version.pdf.

Vance, Laurence M. "Flat Tax is Not Flat." October 21, 2008. Accessed November 23, 2010, http://www.thenewamerican.com/economy/commentary-mainmenu-43/442

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