PUBLIC REVENUE LEAKAGE FROM REAL ESTATE NON-DISCLOSURE LAWS

by

Tanner Bollum

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ABSTRACT

Property tax is the single largest source of local own-source revenue. Due to lack of existing legal structure, county assessors are often left without access to market data. Prior to 2004, three states in the western portion of the United States had constitutions that lacked legislation regarding the disclosure of home sales. This is recognized in this research as non-disclosure laws (NDLs). New Mexico changed this legal structure in 2004 and mandated that county assessors receive all sales information in hopes that property assessments become more equitable. Using two-way fixed effects and a difference-in-differences design, I estimate the change in county level property tax revenue to be a 3.67 percent increase annually.

CHAPTER ONE

INTRODUCTION

Revenue from property taxes is the largest single component of own-source revenue for local governments (Bell 2012). Bell (2012) further notes that on average over 95 percent of the revenue generated from property tax stays within the budget of local government. Harris and Moore (2013) found that property tax accounts for up to 80 percent of local tax revenue. The real value of property tax revenue has steadily increased from 1970 to 2012 (Census of Government, 2012). The most important factor in estimating the property tax liability of a given homeowner is the market valuation of an individual's home. This poses a problem for some county assessors because in several states, home values are kept confidential to the individuals that are involved in the sale under what are known as non-disclosure laws (NDL). These laws specify the right to privacy that homeowners possess with respect to the outcomes of real estate market transactions. NDLs explicitly restrict who is allowed access to information regarding the sales price of homes. In some cases, county assessors are not included in the list of entities that are privy to the sale information and price discovery that are byproducts of home sales during open market transactions. Many implications arise from the fact that home price data are kept confidential in states with an NDL. Most notable is the difficulty in calculating property taxes. Because county assessors are charged with estimating the market value of homes for purposes of assessing property taxes, lack of market sales data can create challenges from a local fiscal revenue standpoint.

The overarching issue posed by NDLs is one of asymmetric information. Asymmetric information is described as a situation in which parties who engage in transactions have different amounts of information about the specifics of the arrangement. This paper adds to the expanding list of research that measures this type of market failure. Information economics gained attention in 2002 with economist Joseph Stiglitz. In the summary of his Nobel Prize speech, he wrote about the flaws with the neoclassical view of the "invisible hand" and efficient markets theory.[1] His research urged economists to continue to think about what was missing from economic models and the role government could play in reducing market failures, namely, asymmetric information. The research question is perhaps best stated as, "How does competition compare to regulation as a mechanism for encouraging sellers to provide valuable information to buyers?" (Milgrom,2008 p. 115) Stiglitz (2002) theorized that ensuring proper access to information is a key role of government as information shapes every choice humans, firms, and economies make.

This paper shows one small example of the issues Stiglitz talks about when government fails to alleviate problems with dispersion of information. Specifically, I seek to answer the question of what effect non-disclosure laws (a source of asymmetric information) have on property tax revenue. This study provides a detailed look at the political economy of non-disclosure home laws and the logic behind them. I explore applied and theoretical economic research to examine

[1] The invisible hand references Adam Smith's theory that the most efficient market is one in which no government intervention occurs. All markets clear and resources are allocated in a utility maximizing manner as if with an invisible hand (Smith, 1776).

the driving causes behind NDL legislation and describe how it affects public revenue outcomes. Using a county-level panel dataset spanning 1982-2012, I estimate how local property tax revenue responds to a relaxation of NDL using a difference-in-differences research design. Specifically, I use a change in New Mexico's 2004 state legislation as a natural experiment. I use Idaho and Utah as comparison groups, as these two states had a similar NDL policy as New Mexico prior to the legislative change. I collect data on assessor behavior as well as demographic controls. Using county and time fixed effects, I control for unobserved variation across time and space.

The literature surrounding property tax laws is rich and diverse. Researchers have focused their analysis on the regressively of property taxation and consumer disclosure mandates. Economic literature, however, is very limited on the topic of how disclosure laws affect property tax. Berrens and Mckee (2004) attempt to draw inferences on the 2004 New Mexico policy change as it relates to property tax revenue. However, their paper use data solely prior to the effective date of the policy. Their conclusions, therefore, cannot show the real effect from the policy change. In this paper, I seek to correct this in several ways. I use observations from several other states besides New Mexico and have data from before and after the policy change. Using my framework, I estimate the real tax revenues effects on each county in New Mexico and show how large and significant this change is.

As of this writing, this is the first paper to measure the policy effect of non-disclosure home price laws on property tax revenue. This study finds that the average county in New Mexico experienced a 20.2 percent increase over a five-year span in property tax revenue after the policy is put into place. This result is statistically significant and robust to many different model

specifications. Some caution is warranted in interpreting my results, however, as I also find evidence that property taxes in New Mexico were systematically lower compared to the two comparison states prior to the policy change.

The following chapter of the paper is dedicated to describing the background and history of the non-disclosure laws and the responses to them from affected county assessors. I then move to discussing contributing literature. The subsequent chapter describes my data sources and how I use them in my research. The methods chapter gives a detailed look at the variables used and how I control for variation across space and time. I include how the data were manipulated, as well as the empirical model used to obtain my results. This section is followed with a detailed description of the interpretation of my results with an explanation for serveral discrepancies. I end the thesis with a conclusions chapter where I detail what possible further research could be accomplished using this research as a starting point. I also spend time in this section describing what questions, issues, and concerns this paper brings up.

CHAPTER TWO

BACKGROUND

2.1 Western Non-Disclosure Laws

The justification for non-disclosure laws is perhaps best stated in the Montana Public Disclosure of Real Estate Report (2014). Montana justifies their non-disclosure law by saying "The legislature finds that the demands for individual privacy outweigh the merits of public disclosure." The disclosure of property transaction prices is ultimately a matter of private versus public access to information. States have generally weighed these two ideas in three broad ways.

For the purposes of this thesis, it is important to discuss the three main categories of market participants that are involved with the housing market. The three categories are consumers, market professionals, and assessors. These categories are created based on legal access to home sales data in states that are included in this study. The consumers will be defined as buyers and sellers of real estate. These market participants do not engage in the market every day and their income is not normally derived from the real estate market. Market professionals, on the other hand, engage in the market for a living and have a vested interest in the knowing the movement of the real estate market. These professionals include appraisers, brokers, and agents. The quality of work of these professionals is directly related to their knowledge and understanding of current market conditions. The final category is county assessors. These individuals assess the value of

property for the purpose of calculating the tax burden for the homeowner.[2] Laws surrounding disclosure of home sales price have a different effect on individuals in each of these categories.

In the western United States there exist three levels of property sales disclosure laws. States can mandate public disclosure, outlaw public disclosure, or can omit a disclosure law from their constitution entirely. States that mandate public disclosure include Washington, Oregon, and California. In these states the general public is able to view all home sale prices. This obviously includes assessors and market professionals. States that outlaw the disclosure of sales data include Montana and Wyoming. In these two states there exists a specific law that prohibits disclosing the sale price of a home if you are not the buyer or seller of the home. For the intended purposes of this paper, it is important to note that in both of these states, county assessors are mandated to receive sales data from every home buyer in the county (MCA 15-7-308). In these "partial non-disclosure" states, every home buyer is required to submit a receipt of transfer that is held in confidentiality by the clerk's office, where the assessor sits.[3] Before 2004, three states possessed no laws regarding the disclosure of home sale data to private individuals or government entities: Idaho, Utah, and New Mexico. In these states, until 2004, all home sales information could be voluntarily given up to anyone who asked. There was no requirement,

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[2] Assessor are not appraisers. Assessors are government employees who estimate home values for tax burden measurement. Appraisers, on the other hand, estimate home values for lending institutions or consumers. In this paper appraisers are within the market professional category and assessors are in a category of their own. They are so placed due to different treatment of the Multiple Listing Service and state laws regarding disclosure.

[3] See Appendix E for The Montana Code Annotated that describes the confidentiality of home sales.

however, to disclose information to anyone. After 2004, New Mexico became a "partial non-disclosure" state meaning that its assessors were able to access all the information from sales, similar to Montana and Wyoming. The general public was still not able to access the information. This change from "full non-disclosure" to "partial non-disclosure" is the focus of this study. See Table 1 for a summary of disclosure status in the west.

Table 1. Categories of Property Sales Disclosures Laws in the West as of 2012

Category	Mandate Disclosure	Mandate Non-Disclosure	Omit disclosure law
Description	States require the sales price of homes to be public knowledge	States outlaw disclosing home sales price but mandate assessors to hold all sales information	States do not include a law that specifies legality of home sales disclosure
States	Washington Oregon California Nevada Arizona Colorado	Montana Wyoming New Mexico	Idaho Utah

Note: Information was collected from assessors during phone interviews.

In this paper I use a policy change in New Mexico that took effect in 2004 that required all home sales data to be given to county assessors. For the full statute as it reads in the New Mexico Constitution, see appendix A. The new law gives comprehensive property market information to assessors who previously had little to no data. With this law in place all buyers of homes are required to submit:

A. All names of transferors and their mailing addresses

B. Legal description of all property

C. Information regarding all interest and monies that are included in the price

D. Value of personal property transferred in the sale

2.2 Ramifications of Non-Disclosure

Lack of legal structure surrounding property sales in full non-disclosure states has several ramifications. First, the existence and importance of local multiple listing services (MLS) is ensured. This organization is a collection of realtors, brokers, appraisers, and other market professionals. The MLS provides a subscription-based service that provides its members with data from recent sales. Because there is no public database of home sales or market conditions as there is in states like Washington, professionals rely on the services of the MLS who compiles data from hundreds of market professionals. To gain access to the MLS, entities incur two costs. The first cost is a monetary annual subscription. The second cost is the value of all sales data the professional will collect over the same year. It is typically required that all members post their data to the site for other members to access. The data clearly have value as they are required by real estate agents, appraisers and other professionals to perform their job. The MLS captures this value by requiring their members to post the data and therefore, creating a revenue stream built off its own customers' data.

The MLS uses the NDL to create value in their services due to asymmetric information. Although the MLS exists in disclosure states, the value provided from the service is significantly less. Through interviews with county assessors' offices in the full non-disclosure states, I find that in some areas, county assessors may be able to purchase access to the MLS. There are many reasons why county assessors might not gain access to the MLS. First, the local MLS may not

grant access to assessors in the county because the assessors cannot contribute sales data back to the MLS. A county may choose to not join the MLS due to the financial burden of the service. I find that in 2012, 23.6 percent of Idaho and Utah counties had access to the MLS. See the following table for a complete list of counties with MLS access. These counties are typically characterized by larger and more diverse populations with a wider distribution of income and property value levels.[4] It is important to note that the sales information collected by disclosure and partial non-disclosure states is vastly superior to the information collected by the MLS. The MLS does not necessarily collect all sales data and often the data do not capture all elements of the sale.[5]

[4] Given the interview with counties occurred in 2021, and New Mexico experienced such a large change in 2004, I was not able to ascertain any MLS information from New Mexico counties. Assessors' office employees were either elected after 2004 or could not remember if MLS access was granted to their respective county before 2004. In my models and summary statistics I assume that no counties in New Mexico had MLS access before 2004 and thus spent more time lobbying for legislation change.

[5] The MLS attempts to collect all sales in their given jurisdiction. Homes for sale by owner, however, are not captured by MLS. Home buyers can also request their agent not place their information on the MLS site (usually for an additional fee). The MLS also typically does not collect data on real property transferred with the sale nor do they acquire other elements of the sale such as an all-cash price. Often counties in non-disclosure states will pay to access these data but they are not a perfect substitute for mandatory disclosure laws.

Table 2. Counties with Access to MLS in 2012

Idaho		Utah	
Ada	Custer	Beaver	Millard
Adams	Freemont	Box Elder	Morgan
Bannock	Gooding	Cache	Salt Lake
Bear Lake	Jeffereson	Carbon	Sanpete
Bingham	Jerome	Dagget	Tooele
Blaine	Kootenai	Davis	Uintah
Boise	Madison	Duchesne	Utah
Bonner	Minidoko	Iron	Washington
Bonnerville	Nez Peirce	Jaub	Wayne
Canyon	Owyhee	Kane	Weber
Carribou	Teton		
Cassia	Twin falls		

Note: Information comes from phone interviews with county assessors.

The second ramification of non-disclosure laws affects county tax assessors. County assessors attempt to estimate the value of a home for the purpose of calculating property tax. The process is generally composed of collecting market data, building regression models to estimate house values with given traits, and then using these models to produce the assessed value of homes in the county. The county treasury department is then typically responsible for calculating the tax burden given the assessed values of all property in the county.

In “full non-disclosure” states, home buyers are under no obligation to tell the assessors what they paid for the home. Under these circumstances, assessors have several methods of collecting

data to build market analysis models.[6] First, for every home sold, county assessors send out questionnaires that ask for the sales price and characteristics of a home. Filling out the questionnaire is not mandatory, and therefore response rates are usually low. From interviews with county assessors, I found a 15-20 percent response rate is common and inaccuracies are prevalent. Because answering the questionnaire is not mandatory and homebuyers may worry that their response will increase their property taxes, they have an incentive to understate the price they paid for the home. Forgetting to mention the house was paid for in cash, omitting real property that was included in the sale and willful lying about the sales price are all issues the assessors must worry about. All of these issues result in errors on the side of undervaluation.

As discussed above, county assessors often rely on access to the MLS to receive some of the sales data. Most common in more populous counties, access to the MLS can prove too costly for governments of smaller counties to afford. There have also been several instances of MLS declining to provide services to county assessors, however, from interviews with county assessors, these seem to be becoming less frequent as instances of gaining access have increased in recent years.

The last method assessors use to collect data for modeling is to create relationships with local professionals to receive word of mouth sales information. This is the most prevalent and

[6] All information on assessors was collected in phone interviews with offices of county assessors during the months of December 2020 and January 2021.

effective method in rural counties with smaller populations and fewer home sales. In full non-disclosure states, there are no laws discussing who can reveal property sales data, so real estate agents are legally permitted to disclose pricing information. Even when all these methods are combined, data points are missed and faulty data are kept. The working hypothesis of this paper is that lack of disclosure laws combined with inferior data collection methods cause downward bias in property tax revenue.

2.3 Yield Control

It is important to mention the several statutes requiring property tax yield control in the state of New Mexico. As a summary, yield control in New Mexico is a very complex piece of legislation to understand but it can be broken down into two parts. The first part places limits on county assessors. Yield control as it applies to county assessors specifies a three percent cap on annual assessment increases on residential owners who:

A) Claim the house as a their primary residence
B) Have remained in ownership of the home since the previous tax assessment

Other homes will be assessed at the market value.[7] This information can be found in NMSA 7-36-21.2 in appendix D.

[7] Market value is typically defined as the sales price of existing homes or the construction cost of newly built homes. By using both the sales approach and cost approach, assessors feel their models are more robust to housing price bubbles.

The second portion of yield control places a limit on increases to county level property taxes revenues. Yield control, as it applies to this portion, states that property tax revenue cannot be increased due to reassessment or increases in market value. The counties acomplish this by adjusting the mill rate to offset adjustments in market value. The mill rate is defined as tax liability per thousand dollars of assessed taxable property. As property values change, the mill rate moves in the opposite direction to ensure the county level revenue remains constant. For example, theoretically if home prices rise by 10 percent, the mill rate will decrease by 10 percent. This, however, is not without its caveats. County revenue can increase based on a growth factor which is calculated from:

A) new construction
B) property additions
C) inflation
D) changes in the value of mineral properties

The growth factor is interacted with the previous year's tax revenue to calculate the current year's maximum allowable tax amount. It is of interest to note the growth factor cannot be set at a value of less than one, meaning the maximum allowable tax amount can never decrease. These regulations are written in NSMA 7-37-7.1 See appendix C for the full section.

Due to item D, mining operations are included in the growth factor. Mineral extraction is a large and growing industry in New Mexico. From 1997 to 2012, mineral value extracted from New Mexico grew at an average of $81 million per year. In 2012 mineral production value was estimated at $2.8 billion dollars (Geoinfo, 2016). Properties engaged in mineral extraction face several tax liabilities. These liabilities serve as deductions to the property tax on the business (NSMA 7-36-23). Due to these deductions, tax revenue should increase in smaller magnitude than the growth factor.

Because the growth factor includes property additions as well as changes in the value of mineral properties and because the growth factor can never be less than one (allowable revenue can never be less than the previous year), yield control legislation should only be binding for individuals who remain in their homes through the treatment period of this thesis.

2.4 Qualitative Hypothesis

The theory of this paper is that property assessments in full non-disclosure states will be biased downward for three reasons. First, if the assessors use self-reported questionnaires to determine property values, the home owner, who is responsible for paying the tax on the home, has an incentive to understate the value of the home. Second, assessors have no incentive to increase property tax revenue and understand that an increase in taxes leads to homeowners contesting the value of their property. Justifying property assessments costs both time and local resources so in the presence of uncertainty, assessors will choose to estimate on the conservative side. On a similar note, because assessors are either elected, or appointed by an elected official, it is in the assessor's best interest to maintain a positive public image and understate market values (Ross, 2011). Finally, when the assessed values are reported to homeowners, high assessments will be disputed while low assessments will generally remain unchallenged.

For these three reasons I expect property tax revenue to be characterized by leakage in areas that have more uncertainty in property values. Leakage in this paper will be defined as a shortfall in potential revenue. When building predictive models (such as assessors' home value estimation models), the fewer data points used, the larger the confidence intervals. If assessors systematically choose values on the smaller side of their estimation models, all else equal, models that produce wider confidence intervals will cause downward bias and tax leakage to be

greater. This theory is backed by Berrens and McKee (2004). In their paper they explain their belief is that “If errors in property tax assessments exist due to sales price nondisclosure, we do not expect them to be simply random. That is we would expect them to be biased downward (where homeowners are less likely to complain). As such, they may constitute a significant source of public tax revenue leakage.” (Berrens and McKee, 2004, p. 511)

CHAPTER THREE

LITURATURE REVIEW

The existing literature on the topic of non-disclosure laws is slim. The lack of access to data creates barriers to researchers attempting to understand more about the effects of non-disclosure policies. This literature review includes all papers on the topic of NDL as they relate to home sales price. Beyond the disclosure of the final transaction price, some other areas of home sales have policies that require certain disclosure. I also include a review of a sample of the literature examining the effects of these other types of real estate disclosure rules. Finally, I include a collection of papers that examines public finance leakage and vertical property tax inequalities.

3.1 Home Price Non-Disclosure Laws and Assessor Behavior

Berrens and McKee (2004) examines the same policy variation that I utilize in this study. This paper uses data from Albuquerque to calculate effective tax rates for square mile blocks within the city. The tax rate as it applies to this paper is defined as the ratio of tax liability to market valuation of the home. The analysis is conducted by regressing the tax rate on the home prices within that square mile. Berrens and McKee (2004) find that several areas had a negative coefficient with the regressor “home price”. This implies that vertical inequities existed, and property taxes went under collected in the richer neighborhoods. There are many issues with this paper that are brought up by the researchers. They state, “We are aware that the empirical evidence we present here (e.g., the Albuquerque, NM case) may raise more questions than it

answers. For example, there may be a reciprocal causality between sales prices and the effective tax rate" (Berrens and McKee, 2004, p. 518). Another potential issue with this paper is the lack of geographical variation in NDL adoption. The researchers do not include any data from areas without NDL which raises the question of whether these results are caused by, or even correlated with, NDL.

Morey (2010) focuses on Texas's NDL and suggests that errors in assessment will lead to tax revenue leakage and inequity. The claim being that this procedure goes against the Texas Constitution in that property taxes are required to be assessed at 100 percent of market value. If market value is unknown to assessors, it stands to reason that many properties will not be assessed at market value but rather at an estimate of market value. The author also claims that the MLS holds an unfair monopoly on the information that would be beneficial to the general public. While the paper makes these two claims by showing examples as anecdotal evidence, the paper lacks rigorous statistical analysis and modeling.

Glennon and Keifer (2018) claim that theory suggests that because homes are a heterogeneous good, and the market is filled with heterogeneous customers, the value of a home is actually a distribution of values. This study examines the challenges with estimating point values of individual home prices using home price indices, a common practice for both assessors and appraisers. Using these estimation strategies, bias can occur in valuation. The researchers only use observations from the four most populous counties in the United States and throw out any observations that do not have repeat sales. Repeat sales are imperative to measure the accuracy of the estimation model. Over the course of 2000 to 2015, the median error percentage

rose as high as 1.5 percent. Conclusions mention that by using forecast combination methods, measurement error can be reduced.

Ross (2011) studies the pressures placed on county assessors to understate the assessed values of homes relative to market value. Because assessors are either elected or appointed by an elected official, job security depends on satisfaction of the county voters. As Glennon and Keifer (2018) pointed out, the true value of a home is a distribution of values, and assessors may have an incentive to select a point estimate towards the bottom of the distribution. Panel data are used from 2001 to 2006 and the authors use the sales ratio as a dependent variable. The sales ratio is a figure used to measure the accuracy of assessments and calculated by dividing the assessed value by the sales value. Ratios near 1.0 reveal an accurate assessment. This paper concludes by saying that election pressures end up creating a downward bias in the assessment to sales ratio, although the magnitude and statistical significance of this bias varies between appointed and elected assessors.

3.2 Other Disclosure Laws

In addition to property price non-disclosure laws, laws specifying the disclosure of other information can affect real estate markets. This section examines papers that have researched mandatory disclosure laws and their effect on consumers and sheds light on what type of information disclosure changes consumer behavior and how NDL fits into the literature.

Bryant and Eves (2011) look at a law passed in Queensland, Australia that required the disclosure of environmental features in homes sold. The researchers used survey data to first measure compliance with the law. Using these data, the paper finds that compliance was very high in the first year. The analysis continues by then surveying consumers to find the change in

behavior from the disclosure of the information. After being presented with the information regarding environmental features in the home, consumers made few if any adjustments to purchasing behavior. The researchers maintain that in the following years, with close observation, Australia will see increased changes in behavior from the disclosure of environmentally sustainable practices.

Lee and Hogarth (2000) measure the amount of search time that consumers take when shopping for a home loan. Using the change following the Truth in Lending Act, the researchers measure consumers' behavior before engaging in a loan. [8] From data produced by University of Michigan's Survey of Consumers, the researchers utilize a log linear model using a categorical data modeling procedure. Conclusions are reached by stating the average consumer uses two sources to receive information on a mortgage product. The most common information sources are banks and lending service providers and the interest rate was the most important feature to the consumer. The paper argues that the costs of searching for mortgage and other financial products are causing the amount of information searching to be less than optimal.

Ben Sharar and Golan (2019) publish a study that measures the behavior of consumers following a court order to publish transaction data in Israel in 2010. In Israel all property

[8] The Truth in Lending Act specified specific elements for mortgage providers to disclose to their customers before issuing a loan. The purpose of this act was to reduce the number of predatory loans written to uneducated consumers.

transactions must be reported to the Tax Authority which, prior to 2010, held the information in confidentiality. In 2010 the courts ordered the Tax Authority to report all transactions on their website for public dispersion. Using a large sample of 222,163 property-level observations, the analysis models price dispersion in quality-adjusted property prices over the 2007-2013 period. After releasing price data, the housing market experienced a 12 percent decrease in price dispersion, which implies that the access to price information created a more consistent home market.

Palm (1989) measure the effect of a policy in California that required real estate agents to disclose a home's proximity to a fault line. The researcher collected survey data on home buyers near a fault line that included whether the real estate agents were complying with the law, changes in behavior of the consumer, whether complete knowledge was being transferred to the consumer, and whether this disclosure policy was effective at helping consumers. Results from the survey were mixed, but generally, consumers did not behave in significantly different ways when they were informed of a fault line near their prospective homes. Buyers could remember very few details about the information being disclosed and most said it did not impact their decision in a significant way. The author could not conclude whether the findings were due to lack of information of the dangers of earthquakes or from insurance policies settling the fears of consumers.

Troy and Romm (2004) exploit a new law introduced in California that mandated the disclosure of floodplain characteristics of homes. Their analysis utilizes hedonic pricing models to measure homes in floodplain areas before and after the law passes. The conclusions are drawn from measuring changes in non-floodplain areas as a control to estimate the difference-in-

differences models. Homes in floodplains sell for 4.2 percent less than non-floodplain areas after the law passes, whereas before the law, the authors found that there was no noticeable difference, with the largest effect coming from Hispanic home buyers.

Walsh and Mui (2014) measure changes in consumer behavior following a 2004 change in New Jerseys disclosure laws. The law specified that sellers of real estate must disclose the specific information of contaminated sites within the area. Hedonic model is used to measure the change in price due to the passage of the law and the authors find that homes near well-known contaminated sites were not affected while homes near less-known sites saw a noticeable drop in prices.

3.3 Property Tax Inequities and Leakage

In this subsection I compile a selection of articles that show where, how, and why tax revenue leakages occur. Several researchers also point to inequities and their effect on revenue leakage. This was first shown by Kochin and Parks (1982). This paper recognized the statistical anomaly of regressive property tax inequity. They argue that bias exists not due to estimate errors but rather an inefficiency of estimation. Authors in the following section continued this work by summarizing major issues with the manner in which property taxes are assessed and collected.

Berry (2021) shows from millions of observations that regressive property tax inequity exists across the United States. Using data from major cities including Chicago, New York, and New Orleans, this paper demonstrates that properties in the bottom decile, on average, pay twice the tax rate as properties in the top decile. The tax rate in this paper is defined as the ratio of tax

liability to home sales price. Berry (2021) feels confident that these issues can only be explained by limitations on data and inaccuracies of methods used in property assessment.

Spar and Sunderman (1998) discuss the favorable property tax rate used in assessing the tax liabilities on agricultural properties. The authors discuss reasons, background information, and implications of using income-based property taxation. Measurements are then taken on property tax leakage in rural communities though property taxes. After collecting data on over 700 ranch and farm sales in Teton County Wyoming, a hedonic model is built that measures the income generating attributes of the ranch or farm. This is compared to the assessed productive value for taxation. The paper finds that there are large inaccuracies in the valuation of agricultural properties leading to a large tax revenue leakage.

Allen (2003) measures vertical inequity in multifamily homes. Vertical inequity is described in this paper as unfairness in property taxes based on the fair market value of the home. Because property taxes are a large portion of local revenue, and a large portion of personal budgeting, this issue has serious effects on the community and consumers. This paper first details the many ways that researchers in the past have measured inequity in property tax calculations. These calculations include linear regressions, two stage regressions, ratio studies, and others. The analysis section then uses these methods on the same sample of residential units in Fort Lauderdale, Florida. Sale price and assessed price are used from 688 multifamily home sales. Vertical property tax inequity is tested using six models from published papers. There is significant evidence in five of the models that regressive inequity exists (favors more expensive properties). The author claims the owners of properties should carefully examine their property taxes to ensure they are paying an equitable amount.

Benson and Schwartz (1997), attempts to prove the existence of regressive property tax inequity in single family homes within Bellingham, Washington. The data consist of 1,118 home sales from 1990 to 1994. Washington law requires that all home sales be reported to the county assessor who is required to reassess every property once every four years. Because Washington mandates public home sales disclosure, the researchers were able to show conclusively that average sale prices rose dramatically over the term of their study. Assessments followed the rise of home values accordingly and assessment to sales price ratio maintained a steady 85-90 percent during this time. Three separate models are used to test for vertical inequity. The paper specifically notes the large underassessments in properties above $400,000. Conclusions attribute these underassessments to lack of knowledge of amenities inside the home, wealthy homeowners' ability to challenge the assessments, and low amount of transactions for high value homes. This underassessment, of course, causes tax revenue leakage.

Birch and Sunderman (2014) address several flaws with previous models for vertical tax inequity. The authors point out that many models have measurement bias that was only overcome by Clapp (1990) and his model using IV instruments. This model itself, however, had omitted variable bias without variables to control for districts or neighborhoods. Neighboring houses and school districts had large effects on the valuation of homes. Birch and Sunderman (2014) then write a new model that uses a summation term to measure horizontal inequity within neighborhoods and districts. This term can also be used to measure vertical inequity between neighbors of different income level and the authors maintain that this is important because "geographic changes in relative property values are not always accounted for in annual property reassessments"

3.4 Literature Review Summary

Even though the existing research on NDL is sparse, there are several important insights that can be gleaned from this review. First, it is important to note that several researchers have specified the need for further research on NDL. These authors have come up with similar hypothesis as this paper. The lack of information on property values will lead to downward biases in assessments and ultimately cause a tax revenue leakage. Second, research has shown that assessors understate their assessments due to political pressures. Basic statistics says that confidence interval size increases in models that have smaller sample sizes. All else equal when downward pressure is placed on estimation models with larger confidence intervals, errors become larger. Finally, the manner in which assessors build estimation models may in itself contain measurement errors (Berry, 2021).

CHAPTER FOUR

DATA

4.1 Data Sources

Data for this project come from the Census of Governments (CG) and Census of population (CP). From the county finance reports produced by CG, I collect county tax revenue. These revenues are inclusive of all county revenue sources including municipalities, school districts and other governments that levy taxes. These observations are aggregated to the county level, and measured every five years. I convert all revenue values into 2017 dollars using the GDP deflator.[9] I then divide each observation by county population from the CG. These data manipulation steps give a real property tax per capita rate which serves as the dependent variable for this study.

The variable of interest is the dummy variable to denote the non-disclosure law being turned on in New Mexico after 2004. I code a disclosure dummy variable to equal 1 in counties where the disclosure law is turned on (New Mexico counties for years 2007 and 2012) and 0 everywhere else. Also constructed by hand is the MLS control variable. This variable takes a

[9] Deflator Index data comes from https://fred.stlouisfed.org/. I set the base year at 2017 and adjust all dollar values.

value of 1 for counties that had MLS access for that year and a value of 0 everywhere else. For the purposes of this study the MLS is an absorbing state- once MLS access is attained the county maintains access for the duration of the data.[10]

MLS access data were collected through phone interviews with county assessment offices. Interviews were conducted Monday through Friday during work hours. The interview process occurred from December 2020 to January 2021. The questions that were asked were:

1) What methods does this county use to collect sales data for use in valuation estimation?

2) Does this county have access to the local Multiple Listing Service?

a. What year was access granted?

*If MLS was granted before the longest tenured employee:

b. When did the longest standing employee begin work?

3) What else should I know about non-disclosure laws and assessment in your county?

County assessment personnel were generally willing to respond to the survey and added several insightful points that helped to refine this research project. Many counties, however, were not able to give accurate answers either because they had MLS access for longer than the longest standing employee or good records were not kept as to the year access was granted. I code two

[10] Some counties did temporarily lose access to the MLS during 1982-2012. In every case the county was granted access again before the next county revenue data point. For this reason I treat MLS access as an absorbing state.

separate variables to bound this uncertainty. In the first variable, any observation with uncertainty as to MLS access was coded as though no access was granted. In the second variable, any uncertain observation was coded as if access was granted. For example, in county A, the assessor has had access to the MLS since his first day in the office in 2001. He is unsure of how early the county gained access to the MLS but he is sure of the access for 2001-2012. MLS1 would treat this county as having MLS access from 2001-2012 while MLS2 would code this county as having access from 1982 to 2012.

The project uses data for controls on family income, education, occupancy rates, race, housing density, rural population, gender, and age demographics.[11] See table 3 for a description of each variable.

[11] Some of these data observations were only measured every ten years. The other variables were taken in in five-year increments so approximation was needed. For this study, variables with measurements every 10 years were extrapolated to the following two observations of five-year increments variables, I.e. The 1980 observation was used for both 1982 and 1987 observations.

Table 3. Variables used in the Models and their Description

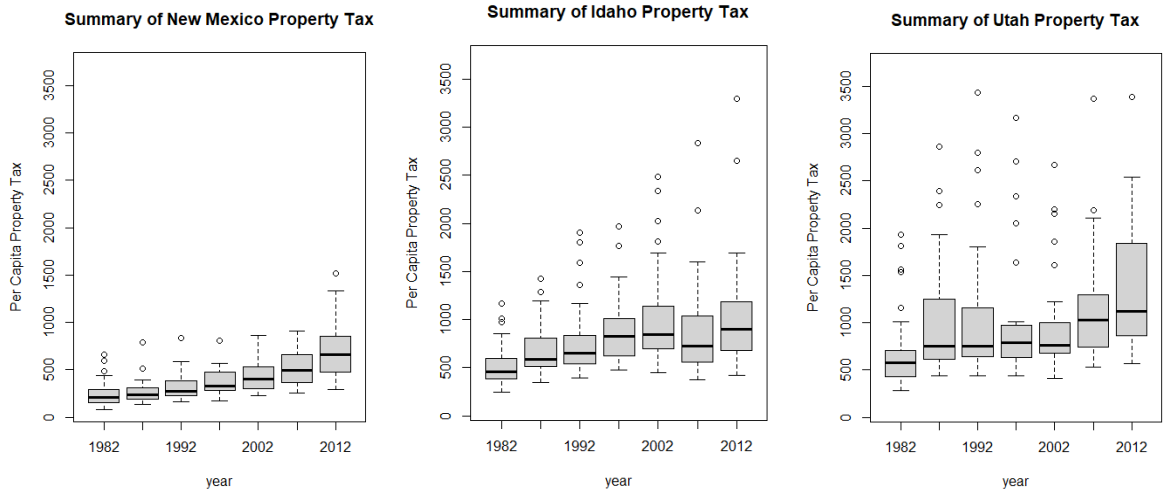
Variable	Description
Property Tax Per Capita	The log of property tax per capita in real terms
Disclosure	A dummy to denote whether the county has access to all sales data
Agricultural Land Percentage	The percentage of the county that is used for agricultural purposes
MLS Access 1	A dummy to denote if the county has access to the MLS in that year (all uncertain observations do not have access)
MLS Access 2	A dummy to denote if the county has access to the MLS in that year (all uncertain observations do have access)
Housing Density	The number of housing units in the county divided by the area in the county
Rural Population	The percent of the population who lives in rural portions of the county
Male Percent	The percent of residents who identify as male
Percent School Age	The percent of population under the age of 18
Family Income	Family income measured in thousands
College Educated	The percent of population who has a bachelor's degree or higher
Occupancy Percent	The percent of units that are occupied
White Percent	The percent of the population that identifies as white

Notes: Variables used in the models for controls come from the Census of Government and Census of Population

4.2 Summary Statistics

In this section I report several sets of summary statistics from this data set. The per capita property tax for each county over time is the dependent variable. See figure 1a-1c for a box plot of this variable. The figure shows several things. First, there is a slight upward trend in real property taxes in all states with Idaho seeing the smallest uptick. The variance in property tax is by far greatest in Utah followed by Idaho.

Figure 1a-c. County Level Per-Capital Property Tax by State



Note: County level per capital property tax is show in this figure. The ends of the box represent the upper and lower quartiles, median is shown by the dark horizontal lines, and the end of the upper and lower whiskers show plus or minus 1.5 times the interquartile rage respectively. Outliers are shown by dots outside the whiskers. Property tax per capita is in real terms.

The summary statistics are shown for every variable in the model in table 4. I report the mean and standard deviation for each state as well as a composite of Utah and Idaho. The composite column shows the comparison group for this study against the treatment state of New Mexico.

In this table several items are important to note. It is immediately noticeable that property tax per capita in New Mexico is quite a bit lower than in the other states in the study, however, as

long as the pre trends move in similar fashions these are still valid comparison groups. Note that disclosure never turns on in Idaho or Utah and therefore has mean of zero. New Mexico had the law turned on in every county for two years (2007 and 2012). New Mexico does have quite a bit more land devoted to agriculture than the other two states.[12] I show summary statistics for the first MLS variable (in which uncertain observations are not given MLS access). This variable shows no access for New Mexico, and only a handful of observations receiving access in the other two states. The housing density is highest in Utah (dominated by Salt Lake City) followed by New Mexico and Idaho, respectively. Rural population, male percent, school age, income, college education, and occupancy percent are all very similar between states. As expected, given its closer proximity to the Mexican border, New Mexico has a lower percentage of residents who are white relative to the other two states.

[12] One clear reason New Mexico has reduced property tax levels is its amount of land devoted to agriculture. Agricultural land typically receives preferential tax treatment, which would have the effect of reducing total property tax revenue in counties with a higher percentage of land in agricultural use (Anderson, 2012).

Table 4. Summary Statistics

	New Mexico	Idaho	Utah	Utah and Idaho
Property Tax Per Capita (2017 $)	394.28 (257.4)	799.88 (392.1)	969.29 (616.7)	867.18 (500.2)
Disclosure	0.22 (0.416)	0.00 (0)	0.00 (0)	0.00 (0)
Agricultural Percentage	0.60 (0.266)	0.36 (0.237)	0.25 (0.197)	0.32 (0.228)
MLS Access 1	0.00 (0)	0.08 (0.273)	0.11 (0.315)	0.09 (0.290)
Housing Density	11.15 (30.79)	8.60 (16.51)	20.22 (61.06)	13.21 (40.92)
Rural Population	0.07 (0.0647)	0.11 (0.0664)	0.09 (0.0706)	0.10 (0.0684)
Male Percent	0.50 (0.0123)	0.51 (0.0134)	0.50 (0.00986)	0.50 (0.0122)
Percent School Age	0.25 (0.0574)	0.26 (0.0477)	0.30 (0.0455)	0.27 (0.0503)
Family Income	42.48 (14.58)	47.17 (8.871)	51.24 (12.46)	48.79 (10.63)
College Educated	0.15 (0.0918)	0.14 (0.0679)	0.17 (0.0716)	0.15 (0.0702)
Occupancy Percent	0.79 (0.143)	0.82 (0.133)	0.79 (0.166)	0.81 (0.148)
White Percent	0.83 (0.164)	0.95 (0.0490)	0.95 (0.0950)	0.95 (0.0710)
N	288	396	261	657

Notes: Mean is reported for the four subsamples. Standard deviation is shown in parenthesis.

CHAPTER FIVE

METHODS

Using ordinary least squares (OLS), I estimate a set of linear, two-way fixed effects models to assess the impact of NDL on local public tax revenue. These models utilize a difference-in-differences design, and in models 1 through 4 the variable of interest is the "disclosure" dummy. This dummy takes a value of one for years 2004-2012 for county observations in New Mexico. For all other observations it takes the value of zero. I make use of the natural log transformation of the dependent variable, which allows me to interpret the marginal effects as percentage changes. This is important to compare changes over time between counties with large differences in property tax revenue.

The five main models are shown below.

1) $$\ln(Per\ Capita\ Property\ Tax)_{it} = \beta_1 Disclosure_{it} + \gamma_i + \alpha_t + \varepsilon_{it}$$

2) $$\ln(Per\ Capita\ Property\ Tax)_{it} = \beta_1 Disclosure_{it} + \boldsymbol{\beta}_2 \boldsymbol{X}_{it} + \gamma_i + \alpha_t + \varepsilon_{it}$$

3) $$\ln(Per\ Capita\ Property\ Tax)_{it} = \beta_1 Disclosure_{it} + \boldsymbol{\beta}_2 \boldsymbol{X}_{it} + \beta_3 MLS_{it}^1 + \gamma_i + \alpha_t + \varepsilon_{it}$$

4) $$\ln(Per\ Capita\ Property\ Tax)_{it} = \beta_1 Disclosure_{it} + \boldsymbol{\beta}_2 \boldsymbol{X}_{it} + \beta_3 MLS_{it}^2 + \gamma_i + \alpha_t + \varepsilon_{it}$$

5) $$\ln(Per\ Capita\ Property\ Tax)_{it} = \beta_3 MLS_{it}^1 + \boldsymbol{\beta}_2 \boldsymbol{X}_{it} + \beta_4 1(state = NM_i\ t \leq 2012)\alpha_t + \gamma_i + \alpha_t + \varepsilon_{it}$$

Subscripts i and t denote county and time specific observations respectively. β_1 is the parameter change estimate of the effect of the disclosure dummy. The first equation is a simple two-way fixed effects model that only includes the disclosure variable and the fixed effects.

Progressing from this, each model adds structure and complexity. In models 2- 5, I add the control variables. In these models, $\boldsymbol{X}_{it}$ is the vector of control covariates and $\boldsymbol{\beta}_2$ is the vector of coefficient estimates. Equations 3, 4, and 5 include a specific term for MLS access. As described above, the lack of information regarding MLS access is addressed by testing two alternative variables shown by MLS_{it}^1 and MLS_{it}^2. Examining the differences between models 3 and 4 will show the sensitivity of the results to the MLS uncertainty. County and year fixed effects are represented by γ_i and α_t respectively.

In model 5, I include year interactions specific to New Mexico. The year interactions prior to 2004 show the significance and magnitude of the difference between New Mexico and the comparison group of Utah and Idaho. This model specification allows me to examine whether Utah and Idaho form a valid comparison group for this study. If the pre-treatment year interactions are not statistically significant, it is suggestive of there being parallel trends, which is a requirement for valid inference with a difference-in-differences design. The 2007 and 2012 interactions have a similar interpretation as the disclosure dummy in models 1 through 4. The advantage of this model is the ability to view how marginal effect of the policy changes from 2007 to 2012.

To provide a more intuitive interpretation of the effect of the disclosure law change, I also calculate the marginal effects from the variable of interest. Due to the natural log transformation of the dependent variable, corrections are needed on the OLS estimates to get the true percent effect at the mean (Kennedy, 1981). The equation to transform the estimates into the marginal effects is shown by:

$$g^* = \exp\left(\beta_1 - \frac{1}{2}\hat{V}(\beta_1)\right) - 1$$

Where g^* is the marginal effect of the variable, β_1 is the coefficient estimate from the regression and $\hat{V}$ is the variance of β_1.

I have included an expected signs table created from economic intuition. See table 5 for descriptions of the expected signs of the variables used. These variables have been included in this model because they capture land use, demographics, and other elements that may be correlated with property tax over time and may affect my results.

To estimate standard errors, I utilize a spatial HAC procedure developed by Conley (1999). This code I utilized was written by Hsiang (2010). The program uses latitude and longitude coordinates to create clusters of counties within set distance bands. I use a spatial HAC model because property taxes in counties in close proximity with one another will likely be affected by the same set of unobserved factors. For example, a new amenity in county A will increase the property values in county A, but it is reasonable to expect the values in close neighboring counties will also increase. I build area clusters with 300 kilometers distance bands and temporal clusters that span the entire sample length. The use of the spatial HAC model is a substitute for state level clustering which was not possible due to the fact that the study only includes three states. Utilizing only three clusters may lead to overstating the precision of the estimates (Cameron and Miller, 2015).

To assess robustness, I also estimate the same five models as above while changing the sample length. Due to the fact that in this sample only 2007 and 2012 are post treatment observations, I estimate models with an increasingly shortened sample length to balance the post- and pre-treatment sample sizes. I first estimate all models with years 1982 to 2012. All five

models are then estimated with 1980s observations dropped. Using a shorter length will reduce the possibility of other issues that affect property taxes biasing the β_1 estimates.

Table 5. Table of Expected Signs

Variable	Expected sign	Explanation
Disclosure	+	Disclosure reduces measurement error and revenue leakages
Agricultural Land Percentage	(-)	Agricultural land is taxed favorably so more agricultural land reduces tax revenue
MLS Access 1 and 2	+	MLS should give assessors more data points to build models and increase precision
Housing Density	+	Should indicate cities or populated areas where tax payers are more concentrated
Rural Population	(-)	Denotes favorably taxed properties and a decrease in population density
Male Percent	+	Males are typically living alone or head of families
Percent School Age	Ambiguous	The higher the percent of school children the fewer tax payers there are in a county- but more school children means a heavier need for schools- a common area of funding for property tax
Family Income	+	High family income is a signal for more expensive properties, which lead to higher property tax
Percent College Educated	+	This is typically correlated with more expensive homes
Occupancy Percent	(-)	More vacant properties usually indicate second homes or vacation properties, typically taxed a higher level and more expensive homes
White Percent	(-)	Areas characterized by higher percentage of white individuals are generally thought to be rural and remote counties with lower-valued properties

Note: This table shows the expected signs on coefficient estimates from the main regression based on economic rationale.

I also estimate several models to check other aspects of regression specification. I remove all counties that gain access to the MLS and estimate the same models as above using sample lengths of both 1982-2012 and 1992-2012.[13] By removing counties with access to the MLS, I create a more valid comparison group relative to New Mexico. I use this dataset for the remaining robustness checks. I utilize a weighted OLS specification in which the weights are equal to the square root of the population. Again, this specification is estimated using sample lengths of 1982-2012 and 1992-2012. To test whether other tax revenue is increasing over the same time period, I estimate models in which the dependent variable is non-property tax revenue. This model shows whether the disclosure policy has any effect on revenue that is not derived from property tax. Finally, I estimate a model with interactions between the disclosure dummy and family income. This model shows how the effect of the policy varies with income. Previous research has hypothesized that regressive inequity exists due to assessors' lack of market information. This paper has the opportunity to test this theory using this model specification. If true, counties with higher family income (assuming family income is correlated with value of properties) should see larger effects. This would suggest New Mexico, prior to 2004, had regressive property tax inequity between counties.

[13] After removing all counties that gain MLS access, model specifications 3 and 4 are no longer relevant. For this reason, the robustness check models are only estimated using models 1, 2, and 5.

CHAPTER SIX

RESULTS

In table 6 the main results are shown from models 1 - 5. The regressions show statistically significant positive estimates on the disclosure variable. This implies that the policy change in New Mexico had a positive effect on the amount of property tax revenue collected. This result is robust to fixed effects, time trends, controls, and the MLS access variable.

The disclosure marginal effect for each model is reported in the bottom row of each table. In the first model I include two-way fixed effects but no other controls. The marginal effect from model 1 is 44 percent and significant at the one percent level. As I add in controls and MLS access variables, my marginal effect does continuously decrease but, even in the most modest estimates, the marginal effect is 24.3 percent change in property tax revenue over a five-year span. Models 2 and 3 produce effects estimated at 25.6 and 24.8 percent change, respectively. In these five models every marginal effect is significant at the 1 percent level.

The models intuitively make sense because the signs on most of the control variables match the expected signs in table 5. Both family income and bachelor's degree percentage produce a significant and positive effect in all models. White percentage, rural percentage and agricultural percentage, on the other hand, produce significantly negative coefficients. The only variables that do not produce the expected effect on property taxes are both MLS access variables. The MLS access is significant at the 5-10 percent level depending on what MLS variable is used. These coefficient estimates are negative, indicating that as counties gain access to the MLS, property taxes are decreased-a counterintuitive outcome. This implies that access to the MLS

does not have the same effect as the disclosure law. These results suggest that the data provided in the MLS database causes assessors to further downwardly bias their assessments. As previously discussed, the disclosure law requires all home sale information to be provided for the assessor. This includes price and payment type (cash sale, seller finance, or lender finance). The MLS, on the other hand, often misses these nuances and this leads to an overall downward bias in market conditions. All-cash sales are typically lower than their financed counterparts. If no adjustment is made, including these cash sales in county assessors' hedonic models can decrease the assumed value of properties in the district. The MLS also allows buyers to not be listed in the database for a fee. The customers who use this option are typically wealthier who are buying more expensive properties. Because the MLS omits these properties, county assessors who rely on the service may again decrease assessments. Based on the fact that the dataset does not control for MLS access in New Mexico prior to 2004, a fairer comparison may only include counties in Utah and Idaho that do not gain MLS access. However, despite these issues, the remaining coefficients have the expected effect.

Table 6. 1982-2012 Main Models

VARIABLES	(1) OLS with FE	(2) OLS with Controls	(3) Include MLS1	(4) Include MLS2	(5) Interactions
MLS Access			-0.060		-0.058
			(0.032)*		(0.030)*
Income (000)		0.008	0.008	0.008	0.008
		(0.002)***	(0.002)***	(0.002)***	(0.002)***
Bachelors Degrees		1.911	1.938	1.928	2.028
		(0.477)***	(0.482)***	(0.473)***	(0.489)***
Percent Occupied		-0.174	-0.182	-0.184	-0.196
		(0.180)	(0.182)	(0.178)	(0.177)
White Percent		-0.728	-0.741	-0.736	-0.823
		(0.253)***	(0.251)***	(0.251)***	(0.296)***
Housing Density		-0.002	-0.002	-0.002	-0.002
		(0.001)***	(0.001)***	(0.001)***	(0.001)***
Rural Percent		-1.289	-1.272	-1.244	-1.194
		(0.540)**	(0.535)**	(0.528)**	(0.530)**
Male Percent		0.849	0.780	0.800	0.588
		(1.222)	(1.222)	(1.229)	(1.170)
School Age Percent		0.325	0.321	0.338	0.124
		(0.648)	(0.646)	(0.648)	(0.668)
Percent Agriculture		-0.396	-0.401	-0.401	-0.417
		(0.130)***	(0.131)***	(0.130)***	(0.128)***
NM Linear Trend		0.725	0.731	0.730	0.755
		(0.084)***	(0.083)***	(0.084)***	(0.085)***
ID Linear Trend		0.701	0.709	0.708	0.752
		(0.089)***	(0.089)***	(0.089)***	(0.088)***
UT Linear Trend		0.689	0.697	0.693	0.741
		(0.089)***	(0.088)***	(0.088)***	(0.089)***
Disclosure	0.366	0.230	0.224	0.220	
	(0.051)***	(0.067)***	(0.066)***	(0.067)***	
MLS Access 2				-0.110	
				(0.047)**	
Disclosure Marginal Effects	0.445	0.256	0.248	0.243	
	(0.0734)***	(0.084)***	(0.083)***	(0.083)***	
Observations	728	728	728	728	728
R-squared	0.999	0.999	0.999	0.999	0.999

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

In order to use the difference-in-differences design, the parallel trends assumption must be met. Table 7 weakly suggests that parallel trends with the comparison group pose a potential issue. While the effects in 1987 and 1992 are cause for slight concern, the marginal effect in 1997 is slightly smaller in significance. That the effects decline in magnitude and significance in years closer to the policy change is encouraging, but the effects imply that New Mexico had systematically lower property taxes than the two control states prior to the policy change. Also in table 7, post treatment is shown in year interactions for 2007 and 2012. As opposed to models 1 through 4, this model shows the effects of disclosure specific to each year of observation. These results show that both years suggest significant increases to property tax revenue relative to the comparison group but most of the effect is coming from 2012. I estimate a 13.2 and 30.2 percent change for years 2007 and 2012 respectively.

Table 7. 1982-2012 Main Model Interactions

	1	2	3	4	5
Variables	1987	1992	1997	2007	2012
NM Year Interaction	-0.198	-0.139	-0.111	0.126	0.270
	(0.077)**	(0.061)**	(0.054)**	(0.068)*	(0.102)***
Marginal Effects	-0.182	-0.131	-0.106	0.132	0.302
	(0.632)***	(0.053)**	(0.048)**	(0.077)*	(0.133)**
Observations	728	728	728	728	728

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1
Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table 6. Marginal effects are calculated from the Kennedy (1981) equation.

In order to further test the robustness of the models, I estimate the models above using the 1992-2012 sample length. Table 8 shows all coefficient estimates from model 1 through 4 and control estimates from model 5. In table 9, all year interaction terms are shown from model 5 along with the marginal effects that are produced from these estimates.

In model 1, the disclosure coefficient produces a marginal effect of 37.4. This is significant at the one percent level. When controls are added with models 2 through 4, results become not significantly different from zero. This outcome is supported by results from table 9. In this table, the results appear to be suggestive of the parallel trends assumption being violated but no significant marginal effects are produced with the post-treatment interactions.

Table 8. 1992-2012 Main Models

VARIABLES	(1) OLS with FE	(2) OLS with Controls	(3) Include MLS1	(4) Include MLS2	(5) Interactions
MLS Access			-0.023		-0.018
			(0.036)		(0.036)
Family Income (000)		0.001	0.001	0.001	0.000
		(0.003)	(0.003)	(0.003)	(0.003)
Percent of Bachelors Degrees		2.525	2.541	2.527	2.669
		(0.596)***	(0.600)***	(0.592)***	(0.618)***
Percent of Homes Occupied		-0.482	-0.487	-0.485	-0.560
		(0.278)*	(0.281)*	(0.278)*	(0.306)*
White Population Percent		-0.203	-0.210	-0.202	-0.390
		(0.372)	(0.371)	(0.371)	(0.387)
Housing Density		-0.002	-0.002	-0.002	-0.002
		(0.001)***	(0.001)**	(0.001)***	(0.001)**
Rural Percent		-1.010	-1.004	-0.985	-0.967
		(0.658)	(0.654)	(0.651)	(0.638)
Male Percent		1.396	1.358	1.339	1.272
		(1.398)	(1.404)	(1.403)	(1.359)
School Age Percent		2.051	2.009	2.013	2.191
		(0.832)**	(0.838)**	(0.836)**	(0.862)**
Percent of land in Agriculture		-0.372	-0.373	-0.376	-0.377
		(0.123)***	(0.123)***	(0.124)***	(0.126)***
New Mexico Linear Trend		0.666	0.670	0.670	0.686
		(0.110)***	(0.110)***	(0.110)***	(0.108)***
Idaho Linear Trend		0.564	0.568	0.569	0.611
		(0.111)***	(0.111)***	(0.111)***	(0.107)***
Utah Linear Trend		0.609	0.613	0.611	0.659
		(0.110)***	(0.111)***	(0.110)***	(0.108)***
Disclosure	0.319	0.089	0.087	0.084	
	(0.047)***	(0.060)	(0.060)	(0.061)	
MLS Access 2				-0.053	
				(0.042)	
Disclosure Marginal Effects	0.374	0.092	0.089	0.085	
	(0.065)***	(0.066)	(0.066)	(0.067)	
Observations	520	520	520	520	520
R-squared	0.999	0.999	0.999	0.999	0.999

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

Table 9. 1992-2012 Main Interactions Models

	1	2	3
Variables	1997	2007	2012
New Mexico Year Interaction	-0.027	0.084	0.211
	(0.042)	(0.064)	(0.107)*
Marginal Effects	-0.027	0.085	0.228
	0.041*	0.069	0.131*
Observations	520	520	520

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table 8. Marginal effects are calculated from the Kennedy (1981) equation.

To attempt to build a more accurate comparison group, I remove all counties that gain access to the MLS. I then estimate three separate models using this dataset to examine if the results are robust to several different model specifications. Tables 10 and 11 show results produced from the same models above after removing the MLS observations. For the next specification, I use a weighted regression, with weights equal to the square root of population of the county. The third set of tables were built to check that the policy did not cause an effect on other tax revenue sources. This model uses the natural log of non-property tax revenue as a dependent variable. Theoretically, local government may decrease taxes from other sources if they receive an increase in revenues from property tax or local government may keep other tax revenue constant and increase spending. At any rate, we would not expect to see a statistically significant increase in non-property tax due to the disclosure. All three of these specifications are shown with sample lengths of 1982-2012. See appendix D-G for results from sample length 1992-2012.

Table 10. 1982-2012 Remove MLS

VARIABLES	(1) OLS with FE	(2) OLS with Controls	(3) Interactions
Family Income (000)		0.009	0.009
		(0.003)***	(0.003)***
Percent of Bachelors Degrees		1.607	1.662
		(0.550)***	(0.554)***
Percent of Homes Occupied		-0.017	-0.020
		(0.172)	(0.169)
White Population Percent		-0.734	-0.792
		(0.265)***	(0.316)**
Housing Density		-0.003	-0.003
		(0.001)**	(0.001)***
Rural Percent		-2.335	-2.237
		(0.523)***	(0.538)***
Male Percent		0.940	0.830
		(1.430)	(1.389)
School Age Percent		1.104	0.942
		(0.715)	(0.746)
Percent of land in Agriculture		-0.359	-0.368
		(0.157)**	(0.152)**
New Mexico Linear Trend		0.699	0.714
		(0.095)***	(0.098)***
Idaho Linear Trend		0.671	0.704
		(0.100)***	(0.102)***
Utah Linear Trend		0.659	0.693
		(0.101)***	(0.104)***
Disclosure	0.378	0.224	
	(0.050)***	(0.068)***	
Disclosure Marginal Effects	0.458	0.248	
	0.073***	0.085***	
Observations	539	539	539
R-squared	0.999	0.999	0.999

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

Table 11. 1982-2012 Remove MLS

Variables	(1) 1987	(2) 1992	(3) 1997	(4) 2007	(5) 2012
NM Year Interaction	-0.197	-0.137	-0.090	0.141	0.266
	(0.083)**	(0.062)**	(0.056)	(0.071)**	(0.103)**
Marginal Effects	-0.182	-0.129	-0.087	0.149	0.297
	(0.068)***	(0.054)**	(0.051)*	(0.082)*	(0.133)**
Observations	539	539	539	539	539

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table 10. Marginal effects are calculated from the Kennedy (1981) equation.

In tables 10 and 11, models 1, 2, and 5 are shown. These models are estimated with a dataset that does not include any counties that gain access to the MLS. The results produced are more consistent with the parallel trends assumption and are still showing large and significant results for the disclosure dummy as well as the post treatment year interaction terms. Policy effects range from 14.9 to 29.7 in the 2007 and 2012 interaction respectively. 45.8 percent change is produced from the model 1 disclosure marginal effects. While 2007 is only significant at the ten percent level, all other policy marginal effects have significance at the five to one percent level. In the last data point before the policy takes effect, New Mexico was not significantly different from the comparison group. This is shown in the 1997 interaction term. Prior to 1997, New Mexico's property tax trends fail to follow those of Idaho and Utah.

Table 12. 1982-2012 Remove MLS Weight by Population Models

VARIABLES	(1) OLS with FE	(2) OLS with Controls	(3) Interactions
Family Income (000)		0.001	0.001
		(0.004)	(0.004)
Percent of Bachelors Degrees		3.556	3.629
		(1.047)***	(1.135)***
Percent of Homes Occupied		-0.078	-0.097
		(0.212)	(0.231)
White Population Percent		-0.227	-0.283
		(0.260)	(0.327)
Housing Density		-0.005	-0.005
		(0.001)***	(0.001)***
Rural Percent		-2.904	-2.694
		(0.993)***	(0.978)***
Male Percent		2.622	3.578
		(3.316)	(3.251)
School Age Percent		2.105	1.574
		(0.995)**	(0.969)
Percent of land in Agriculture		0.086	0.005
		(0.117)	(0.113)
New Mexico Linear Trend		-2.082	-2.535
		(2.478)	(2.590)
Idaho Linear Trend		-0.080	-0.048
		(0.034)**	(0.033)
Utah Linear Trend		-0.067	-0.035
		(0.032)**	(0.032)
Disclosure	0.303	0.126	
	(0.055)***	(0.085)	
Disclosure Marginal Effects	0.352	0.13	
	0.075***	0.096	
Observations	539	539	539
R-squared	0.999	0.999	0.999

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

Table 13. 1982-2012 Remove MLS Weight by Population Models

	(1)	(2)	(3)	(4)	(5)
Variables	1987	1992	1997	2007	2012
NM Year Interaction	-0.334	-0.240	-0.132	0.044	0.167
	(0.079)***	(0.077)***	(0.068)*	(0.079)	(0.107)
Marginal Effects	-0.286	-0.216	-0.125	0.041	0.174
	(0.057)***	(0.060)***	(0.060)**	(0.082)	(0.126)
Observations	539	539	539	539	539

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table 12. Marginal effects are calculated from the Kennedy (1981) equation.

The models shown in tables 12 and 13 are estimated using the data set in which all MLS observations are dropped. The models use the same variables as previous tables, but every variable is weighted by the square root of the population. Similar to results from other tables, these models suggest that this robustness check violates the parallel trends assumption. Marginal effects reported from 1987 through 1997 show that New Mexico's property tax moved in a different manner than the comparison group in a statistically significant way. All coefficients are negative indicating that New Mexico's property taxes were systematically less than Utah and Idaho. This specification also fails to show significant results from the disclosure marginal effect in model 2 and the marginal effect from the 2007 interaction term. However, because the parallel trends assumption appears to be violated, conclusions from this specification must be viewed with skepticism. With that in mind the 2012 interaction and model 1 disclosure produce results with magnitudes estimated at 26.05 and 35.17, respectively.

Table 14. 1982-2012 Remove MLS Non-Property Tax Models

VARIABLES	(1) OLS with FE	(2) OLS with Controls	(3) Interactions
Family Income (000)		0.009	0.009
		(0.003)***	(0.003)***
Percent of Bachelors Degrees		1.686	1.711
		(0.519)***	(0.544)***
Percent of Homes Occupied		-0.245	-0.255
		(0.169)	(0.177)
White Population Percent		-0.809	-0.816
		(0.257)***	(0.309)***
Housing Density		-0.002	-0.002
		(0.001)***	(0.001)***
Rural Percent		-2.195	-2.194
		(0.468)***	(0.504)***
Male Percent		-0.299	-0.344
		(1.263)	(1.267)
School Age Percent		0.469	0.591
		(0.562)	(0.633)
Percent of land in Agriculture		-0.330	-0.332
		(0.145)**	(0.145)**
New Mexico Linear Trend		0.837	0.835
		(0.082)***	(0.086)***
Idaho Linear Trend		0.788	0.793
		(0.084)***	(0.089)***
Utah Linear Trend		0.795	0.800
		(0.084)***	(0.090)***
Disclosure	0.432	0.219	
	(0.047)***	(0.058)***	
Disclosure Marginal Effects	0.539	0.243	
	0.072***	0.072***	
Observations	539	539	539
R-squared	0.999	0.999	0.999

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

Table 15. 1982-2012 Remove MLS Non-Property Tax Models

	(1)	(2)	(3)	(4)	(5)
Variables	1987	1992	1997	2007	2012
NM Year Interaction	-0.049	0.012	0.005	0.212	0.266
	(0.068)	(0.049)	(0.049)	(0.062)***	(0.081)***
Marginal Effects	-0.05	0.011	0.004	0.233	0.300
	(0.064)	(0.050)	(0.050)	(0.076)***	(0.104)***
Observations	539	539	539	539	539

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1
Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table 14. Marginal effects are calculated from the Kennedy (1981) equation.

In tables 14 and 15 the non-property tax model specification is shown. The modeling shows very significant results for disclosure in both models 1 and 2. Model 5, shown by the interaction terms for years 2007 and 2012 in table 15, demonstrates a large and statistically significant positive marginal effect. These effects cannot be dismissed due to the strong indication of parallel trends shown with the 1982-1997 interaction terms in table 15. This non property tax term includes all tax revenues that are not derived from property tax. Dozens of revenue sources are included in this term and one or several of these may be causing this increase in revenue. One hypothesis is that mineral properties, whose values have steadily increased over 1997 and 2012 (Geoinfo, 2016), are causing these increases. The mining companies have several tax liabilities that is tied to the value of mineral removed from the state. The increasing values of minerals may have caused this non property tax revenue to increase. If this is the case, these results should not be concerning in anyway.

The final models test for the effect of family income on the policy. I estimate this model by interacting disclosure and family income and including this term in models 1 and 2. The marginal effects are estimated at the mean of family income. For the models 1 and 2 the average is taken from 2007 and 2012 New Mexico family income in thousands of dollars. The average used in these calculations is $51.32 (in thousands). In model 5, I include a 2007 and 2012 New Mexico specific interaction. These terms are also calculated at the mean, but the averages are specific to the corresponding year interaction term. For 2007, the average used is $49.73, while the average in 2012 is $52.91. To get the marginal effect of these terms at the mean, I use the Halvorsen and Palmquist (1980) equation.

Table 16. 1982-2012 Remove MLS Income Interaction Models

VARIABLES	(1) OLS with FE	(2) OLS with FE and Controls	(3) Interactions
2007 New Mexico Interaction			0.079
			(0.061)
2012 New Mexico Interaction			0.278
			(0.093)***
2007 New Mexico * Income			0.002
			(0.001)
2012 New Mexico * Income			0.000
			(0.001)
Disclosure	0.378	0.173	
	(0.050)***	(0.079)**	
Disclosure * Income	0.003	0.001	
	(0.001)**	(0.001)	
Disclosure Marginal Effects	45.943	25.248	
	(7.092)***	(8.658)***	
2007 New Mexico Marginal Effects			16.676
			(6.747)**
2012 New Mexico Marginal Effects			34.179
			(10.466)***
Observations	539	539	539
R-squared	0.999	0.999	0.999

Note: Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1 Standard errors calculated from the Hsiang (2010) method. Marginal effects are calculated at the average using the Halvorsen and Palmquist (1980), method. Averages of family income (000) used were 51.32, 49.73, and 52.91 for disclosure, 2007 New Mexico specific, and 2012 New Mexico specific respectively.

Results show that disclosure marginal effects from the interaction are significant at the one percent level for models 1, 2 and the 2012 interaction term. The 2007 term is significant at

the five percent level. The disclosure results range in magnitude from 25.25 percent to 45.94 percent in models 1 and 2. The 2007 and 2012 interactions produced marginal effects of 16.68 and 34.18 respectively. The disclosure * income terms show how the policy varies with income. Other researchers have hypothesized that regressive property tax inequity causes wealthy families to pay favorable property tax rates due to lack of information. If true, the disclosure policy should have larger effects in wealthier counties. If the disclosure * income terms are positive, increases in family income causes an increase in the effect of the policy. This is consistent with the hypothesis. In this model we find positive coefficients but they are not statistically significant.

CHAPTER SEVEN

CONCLUSION AND DISCUSSION

The disclosure law change in 2004 made real changes in the way county assessors conduct business in New Mexico. These individuals gained complete information in an area where previously data had been unavailable. Assessors are now able to build models that are all inclusive of recent property sales. As previous researchers have theorized, county assessors bias their estimates downward and estimation intervals grow with the lack of data input (Spar and Sunderman (1998) and (Ross, 2011). Using the policy change in New Mexico and these theories, this thesis has shown the effect NDL has on property taxes. For most model specifications and time samples, I find strong evidence that NDLs can put downward pressure on property tax revenue. These results are robust to time trends, fixed effects, and demographic controls. The exceptions to these results exist when controls are added to models that do not have sample lengths of more than 30 years. I also find ezvidence, however that Utah and Idaho may not be a perfectly valid comparison group for New Mexico, so my results should be viewed with this caveat in mind.

To put these results into perspective, the average county in New Mexico in 2002 collected $29.18 million in property tax revenue (Census of Government, 2012).[14] From table 6, the most conservative estimate is 20.2 percent change. This change is over a five-year span, so calculations are needed to find the annual percentage change. Using an annual compounding growth formula gives an estimated 3.75 percent change annually due to removing NDL.[15] Applying this growth to the average county in New Mexico in 2002 gives an estimated increase in revenue equal to $1.09 million. This number is impressive considering that the average county in the same year had direct spending of $82.06 million on education (Census of Government, 2012). Removing NDL is synonymous with producing 1.35 percent of the education budget in increased revenue. This magnitude has legitimate effects for counties that enact the change.

These results, however, are not robust to sample length variation. When the length of the sample is decreased results become insignificant. By receiving more post-treatment data researchers could test for any long-run dynamic effects of the policy change. Another issue is the significant positive coefficient estimate when regressing on non-property tax. This result implies that the law affecting the disclosure of property sales had an effect on the tax revenue that did not come from property tax. This is a counterintuitive and challenging issue. One possibility is that

[14] The year 2002 is the last data point before the policy change occurred in New Mexico.

[15] The formula used is $y = a(1 + r)^x$ where y is the ending value, a is the principle, r is the annual rate, and x is the number of times compounded. Using estimates provided from this research gives y = 1.19762a, x = 5. Solving the equation for x: $1.19762^{\frac{1}{5}} - 1 = .0375$

there was other legislation that passed in New Mexico between years 2002 and 2007. This theoretical legislation increasing another form of tax would then be shown in the same fashion as the "disclosure" variable of interest for this thesis. If this is the case, we would not expect any challenges to the validity of this paper's results. Another possibility, as previously discussed, could be increased value of mining operations. If mining operations increased in value, the tax levied against the business would subsequently increase as well. More research needs to be conducted to determine the reason non-property tax increased in New Mexico after 2002.

Some may argue that if all property assessments were adjusted up to the magnitude of 3.75 percent, county treasury offices would just decrease the effective tax rate down by the same margin in order to keep revenue constant. This is consistent with yield control legislation. However, shown by the summary statistics, New Mexico's yield control is not binding and should not pose a concern for this study.

It is important to note that these results do not say anything about changes to individual amounts of property tax. Previous research has theorized that property tax inequities exist due to lack of market information on properties (Benson, 1997) and (Berry, 2021). If this is true in areas that mandate disclosure, we would expect larger inequity to exist in non- disclosure states. Assessors gaining access to more market data could help correct the issue of property tax inequity. Following a change in NDL, houses in rich neighborhoods may see a large increase in property tax while poorer neighborhoods may not see a change in liability. This possibility is shown this in table 16 with income interactions. These terms show that higher incomes are associated with the policy having a larger effect.

This thesis has proven that more research is clearly warranted in the area of NDL. Further research could be conducted in several areas using this thesis and dataset as a starting point. As previously mentioned, research should be conducted in the area of non-property tax in New Mexico in years post 2004. Following this short experiment, studies should be focused on the next logical point of research: government spending. It stands to reason that if the government collects approximately a 3.75 percent increase in property tax revenue, there should exist a roughly 3.75 percent increase in spending. Using this thesis as a building block, future research could be done to show the effect on amenity quality after counties experience a change in NDL. Schools, roads, and other local services rely heavily on the revenue from property tax and theoretically should see an improvement. This research is of serious importance as Utah and Idaho continue to wrestle with the issues posed by NDL, homeowner privacy, and tax revenue leakage.

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APPENDICES

APPENDIX A

NEW MEXICO'S 2004 POLICY VARIATION

The follow is the entire 2004 New Mexico property disclosure law change as it reads in the New Mexico constitution.

A. After January 1, 2004, a transferor or the transferor's authorized agent or a transferee or the transferee's authorized agent presenting for recording with a county clerk a deed, real estate contract or memorandum of real estate contract transferring an interest in real property classified as residential property for property taxation purposes shall also file with the county assessor within thirty days of the date of filing with the county clerk an affidavit signed and completed in accordance with the provisions of Subsection B of this section.

B. The affidavit required for submission shall be in a form approved by the department and signed by the transferors or their authorized agents or the transferees or their authorized agents of any interest in residential real property transferred by deed or real estate contract. The affidavit shall contain only the following information to be used only for analytical and statistical purposes in the application of appraisal methods:

(1) the complete names of all transferors and transferees;

(2) the current mailing addresses of all transferors and transferees;

(3) the legal description of the real property interest transferred as it appears in the document of transfer;

(4) the full consideration, including money or any other thing of value, paid or exchanged for the transfer and the terms of the sale including any amount of seller incentives; and

(5) the value and a description of personal property that is included in the sale price.

C. Upon receipt of the affidavit required by Subsection A of this section, the county assessor shall place the date of receipt on the original affidavit and on a copy of the affidavit. The county assessor shall retain the original affidavit as a confidential record and as proof of compliance and shall return the copy marked with the date of receipt to the person presenting the affidavit. The assessor shall index the affidavits in a manner that permits cross-referencing to other records in the assessor's office pertaining to the specific property described in the affidavit. The affidavit and its contents are not part of the valuation record of the assessor.

D. The affidavit required by Subsection A of this section shall not be required for:

(1) a deed transferring nonresidential property;

(2) a deed that results from the payment in full or forfeiture by a transferee under a recorded real estate contract or recorded memorandum of real estate contract;

(3) a lease of or easement on real property, regardless of the length of term;

(4) a deed, patent or contract for sale or transfer of real property in which an agency or representative of the United States, New Mexico or any political subdivision of the state is the named grantor or grantee and authorized transferor or transferee;

(5) a quitclaim deed to quiet title or clear boundary disputes;

(6) a conveyance of real property executed pursuant to court order;

(7) a deed to an unpatented mining claim;

(8) an instrument solely to provide or release security for a debt or obligation;

(9) an instrument that confirms or corrects a deed previously recorded;

(10) an instrument between husband and wife or parent and child with only nominal actual consideration therefor;

(11) an instrument arising out of a sale for delinquent taxes or assessments;

(12) an instrument accomplishing a court-ordered partition;

(13) an instrument arising out of a merger or incorporation;

(14) an instrument by a subsidiary corporation to its parent corporation for no consideration, nominal consideration or in sole consideration of the cancellation or surrender of the subsidiary's stock;

(15) an instrument from a person to a trustee or from a trustee to a trust beneficiary with only nominal actual consideration therefor;

(16) an instrument to or from an intermediary for the purpose of creating a joint tenancy estate or some other form of ownership; or

(17) an instrument delivered to establish a gift or a distribution from an estate of a decedent or trust.

E. The affidavit required by Subsection A of this section shall not be construed to be a valuation record pursuant to Section 7-38-19 NMSA 1978 .

F. Prior to November 1, 2003, the department shall print and distribute to each county assessor

affidavit forms for distribution to the public upon request.

APPENDIX B

MONTANA'S PROPERTY TAX DISCLOSURE REQUIREMENT

Below is the entire Montana Code Annotated 15-7-308.

15-7-308. Disclosure of information restricted -- exceptions. (1) Except as provided in subsection (2), the certificate required by this part and the information contained in the certificate are not a public record and must be held confidential by the county clerk and recorder and the department. This is because the legislature finds that the demands of individual privacy outweigh the merits of public disclosure. The confidentiality provisions do not apply to compilations from the certificates, to summaries, analyses, and evaluations based upon the compilations, or to sales data used by the department to value residential property in a property taxpayer's market model area after the property taxpayer signs a written or electronic confidentiality agreement.

(2) The confidentiality provisions of this section do not apply to the information contained in the water right ownership update form or any other form prepared and filed with the department of natural resources and conservation pursuant to **85-2-424** for purposes of maintaining a system of centralized water right records as mandated by Article IX, section 3(4), of the Montana constitution. A person may access water right transfer information through the department of natural resources and conservation pursuant to the department's implementation of the requirements of **85-2-112**(3).

History: En. 84-7308 by Sec. 8, Ch. 528, L. 1975; R.C.M. 1947, 84-7308; amd. Sec. 45, Ch. 27, Sp. L. November 1993; amd. Sec. 2, Ch. 167, L. 1997; amd. Sec. 2, Ch. 70, L. 2005; amd. Sec. 1, Ch. 366, L. 2007; amd. Sec. 2, Ch. 336, L. 2015.

APPENDIX C

NEW MEXICO'S YIELD CONTROL LEGISLATION

2006 New Mexico Statutes - Section 7-37-7.1 — Additional limitations on property tax rates.

7-37-7.1. Additional limitations on property tax rates.

A. Except as provided in Subsections D and E of this section, in setting the general property tax rates for residential and nonresidential property authorized in Subsection B of Section 7-37-7 NMSA 1978, the other rates and impositions authorized in Paragraphs (2) and (3) of Subsection C of Section 7-37-7 NMSA 1978, except the portion of the rate authorized in Paragraph (1) of Subsection A of Section 4-48B-12 NMSA 1978 used to meet the requirements of Section 27-10-4 NMSA 1978, and benefit assessments authorized by law to be levied upon net taxable value of property, assessed value or a similar term, neither the department of finance and administration nor any other entity authorized to set or impose a rate or assessment shall set a rate or impose a tax or assessment that will produce revenue from either residential or nonresidential property in a particular governmental unit in excess of the sum of a dollar amount derived by multiplying the appropriate growth control factor by the revenue due from the imposition on residential or nonresidential property, as appropriate, for the prior property tax year in the governmental unit of the rate, imposition or assessment for the specified purpose plus, for the calculation for the rate authorized for county operating purposes by Subsection B of Section 7-37-7 NMSA 1978 with respect to residential property, any applicable tax rebate adjustment. The calculation described in this subsection shall be separately made for residential and nonresidential property. Except as provided in Subsections D and E of this section, no tax rate or benefit assessment that will produce revenue from either class of property in a particular governmental unit in excess of the dollar amount allowed by the calculation shall be set or imposed. The rates imposed pursuant to Sections 7-32-4 and 7-34-4 NMSA 1978 shall be the rates for nonresidential property that would have been imposed but for the limitations in this section. As used in this section, "growth control factor" is a percentage equal to the sum of "percent change I" plus V where:

(1) V = **(base year value + net new value),** base year value

expressed as a percentage, but if the percentage calculated is less than one hundred percent, then V shall be set and used as one hundred percent;

(2) "base year value" means the value for property taxation purposes of all residential or nonresidential property, as appropriate, subject to valuation under the Property Tax Code [Chapter 7, Articles 35 to 38 NMSA 1978] in the governmental unit for the specified purpose in the prior property tax year;

(3) "net new value" means the additional value of residential or nonresidential property, as appropriate, for property taxation purposes placed on the property tax schedule in the current year resulting from the elements in Subparagraphs (a) through (d) of this paragraph reduced by the value of residential or nonresidential property, as appropriate, removed from the property tax schedule in the current year and, if applicable, the reductions described in Subparagraph (e) of this paragraph:

(a) residential or nonresidential property, as appropriate, valued in the current year that was not valued at all in the prior year;

(b) improvements to existing residential or nonresidential property, as appropriate;

(c) additions to residential or nonresidential property, as appropriate, or values that were omitted from previous years' property tax schedules even if part or all of the property was included on the schedule, but no additions of values attributable to valuation maintenance programs or reappraisal programs shall be included;

(d) additions to nonresidential property due to increases in annual net production values of mineral property valued in accordance with Section 7-36-23 or 7-36-25 NMSA 1978 or due to increases in market value of mineral property valued in accordance with Section 7-36-24 NMSA 1978; and

(e) reductions to nonresidential property due to decreases in annual net production values of mineral property valued in accordance with Section 7-36-23 or 7-36-25 NMSA 1978 or due to decreases in market value of mineral property valued in accordance with Section 7-36-24 NMSA 1978; and

(4) "percent change I" means a percent not in excess of five percent that is derived by dividing the annual implicit price deflator index for state and local government purchases of goods and services, as published in the United States department of commerce monthly publication entitled "survey of current business" or any successor publication, for the calendar year next preceding the prior calendar year into the difference between the prior year's comparable annual index and that next preceding year's annual index if that difference is an increase, and if the difference is a decrease, the "percent change I" is zero. In the event that the annual implicit price deflator index for state and local government purchases of goods and services is no longer prepared or published by the United States department of commerce, the department shall adopt by regulation the use of any comparable index prepared by any agency of the United States.

B. If, as a result of the application of the limitation imposed under Subsection A of this section, a property tax rate for residential or nonresidential property, as appropriate, authorized in Subsection B of Section 7-37-7 NMSA 1978 is reduced below the maximum rate authorized in that subsection, no governmental unit or entity authorized

to impose a tax rate under Paragraph (2) of Subsection C of Section 7-37-7 NMSA 1978 shall impose any portion of the rate representing the difference between a maximum rate authorized under Subsection B of Section 7-37-7 NMSA 1978 and the reduced rate resulting from the application of the limitation imposed under Subsection A of this section.

C. If the net new values necessary to make the computation required under Subsection A of this section are not available for any governmental unit at the time the calculation must be made, the department of finance and administration shall use a zero amount for net new values when making the computation for the governmental unit.

D. Any part of the maximum tax rate authorized for each governmental unit for residential and nonresidential property by Subsection B of Section 7-37-7 NMSA 1978 that is not imposed for a governmental unit for any property tax year for reasons other than the limitation required under Subsection A of this section may be authorized by the department of finance and administration to be imposed for that governmental unit for residential and nonresidential property for the following tax year subject to the restriction of Subsection D of Section 7-38-33 NMSA 1978.

E. If the base year value necessary to make the computation required under Subsection A of this section is not available for any governmental unit at the time the calculation must be made, the department of finance and administration shall set a rate for residential and nonresidential property that will produce in that governmental unit a dollar amount that is not in excess of the property tax revenue due for all property for the prior property tax year for the specified purpose of that rate in that governmental unit.

F. For the purposes of this section:

(1) "nonresidential property" does not include any property upon which taxes are imposed pursuant to the Oil and Gas Ad Valorem Production Tax Act [7-32-1 NMSA 1978], the Oil and Gas Production Equipment Ad Valorem Tax Act [7-34-1 NMSA 1978] or the Copper Production Ad Valorem Tax Act [7-39-1 NMSA 1978]; and

(2) "tax rebate adjustment" means, for those counties that have an ordinance in effect providing the property tax rebate pursuant to the Income Tax Act [7-2-1 NMSA 1978] for the property tax year and that have not imposed for the property tax year either a property tax, the revenue from which is pledged for payment of the income tax revenue reduction resulting from the provision of the property tax rebate, or a property transfer tax, the estimated amount of the property tax rebate to be allowed with respect to the property tax year, and for any other governmental unit or purpose, zero; provided that any estimate of property tax rebate to be allowed is subject to review for appropriateness and approval by the department of finance and administration.

APPENDIX D

NEW MEXICO'S YIELD CONTROL ASSESSMENT CAP

7-36-21.2. Limitation on increases in valuation of residential property.

A. Residential property shall be valued at its current and correct value in accordance with the provisions of the Property Tax Code [7-35-1 NMSA 1978]; provided that for the 2001 and subsequent tax years, the value of a property in any tax year shall not exceed the higher of one hundred three percent of the value in the tax year prior to the tax year in which the property is being valued or one hundred six and one-tenth percent of the value in the tax year two years prior to the tax year in which the property is being valued. This limitation on increases in value does not apply to:

(1) a residential property in the first tax year that it is valued for property taxation purposes;

(2) any physical improvements made to the property during the year immediately prior to the tax year or omitted in a prior tax year; or

(3) valuation of a residential property in any tax year in which:

(a) a change of ownership of the property occurred in the year immediately prior to the tax year for which the value of the property for property taxation purposes is being determined; or

(b) the use or zoning of the property has changed in the year prior to the tax year.

B. If a change of ownership of residential property occurred in the year immediately prior to the tax year for which the value of the property for property taxation purposes is being determined, the value of the property shall be its current and correct value as determined pursuant to the general valuation provisions of the Property Tax Code [7-35-1 NMSA 1978].

C. To assure that the values of residential property for property taxation purposes are at current and correct values in all counties prior to application of the limitation in Subsection A of this section, the department shall determine for the 2000 tax year the sales ratio pursuant to Section 7-36-18 NMSA 1978 or, if a sales ratio cannot be determined pursuant to that section, conduct a sales-ratio analysis using both independent appraisals by the department and sales. If the sales ratio for a county for the 2000 tax year is less than eighty-five, as measured by the median ratio of value for property taxation purposes to sales price or independent appraisal by the department, the county shall not be subject to the limitations of Subsection A of this section and shall conduct a reassessment of residential property in the county so that by the 2003 tax year, the sales ratio is at least eighty-five. After such reassessment, the limitation on increases in valuation in this section shall apply in those counties in the earlier of the 2004 tax year or the first tax year following the tax year that the county has a sales ratio of eighty-five or higher, as measured by the median ratio of value for property taxation

purposes to sales value or independent appraisal by the department. Thereafter, the limitation on increases in valuation of residential property for property taxation purposes in this section shall apply to subsequent tax years in all counties.

D. The provisions of this section do not apply to residential property for any tax year in which the property is subject to the valuation limitation in Section 7-36-21.3 NMSA 1978.

E. As used in this section, "change of ownership" means a transfer to a transferee by a transferor of all or any part of the transferor's legal or equitable ownership interest in residential property except for a transfer:

(1) to a trustee for the beneficial use of the spouse of the transferor or the surviving spouse of a deceased transferor;

(2) to the spouse of the transferor that takes effect upon the death of the transferor;

(3) that creates, transfers or terminates, solely between spouses, any co-owner's interest;

(4) to a child of the transferor, who occupies the property as his principal residence at the time of transfer; provided that the first subsequent tax year in which that person does not qualify for the head of household exemption on that property, a change of ownership shall be deemed to have occurred;

(5) that confirms or corrects a previous transfer made by a document that was recorded in the real estate records of the county in which the real property is located;

(6) for the purpose of quieting the title to real property or resolving a disputed location of a real property boundary;

(7) to a revocable trust by the transferor with the transferor, the transferor's spouse or a child of the transferor as beneficiary; or

(8) from a revocable trust described in Paragraph (7) of this subsection back to the settlor or trustor or to the beneficiaries of the trust.

APPENDIX E

REGRESSION RESULTS FROM 1992-2012 DROP MLS

1992-2012 Drop MLS Counties

VARIABLES	(1) OLS with FE	(2) OLS with FE and Controls	(3) Interactions
Family Income (000)		0.003	0.003
		(0.004)	(0.004)
Percent of Bachelors Degrees		1.890	1.987
		(0.677)***	(0.692)***
Percent of Homes Occupied		-0.172	-0.217
		(0.241)	(0.259)
White Population Percent		-0.183	-0.291
		(0.392)	(0.420)
Housing Density		-0.004	-0.004
		(0.001)***	(0.001)***
Rural Percent		-2.584	-2.540
		(0.536)***	(0.545)***
Male Percent		1.978	1.896
		(1.507)	(1.496)
School Age Percent		2.778	2.895
		(0.819)***	(0.859)***
Percent of land in Agriculture		-0.327	-0.326
		(0.132)**	(0.131)**
New Mexico Linear Trend		0.597	0.607
		(0.119)***	(0.119)***
Idaho Linear Trend		0.498	0.525
		(0.123)***	(0.121)***
Utah Linear Trend		0.537	0.567
		(0.123)***	(0.122)***
Disclosure	0.336	0.089	
	(0.045)***	(0.061)	
Disclosure Marginal Effects	0.398	0.091	
	0.064***	0.066	
Observations	385	385	385
R-squared	0.999	0.999	0.999

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

1992-2012 Time Interactions

	(1)	(2)	(3)
Variables	1997	2007	2012
New Mexico Year Interaction	-0.013	0.088	0.168
	(0.043)	(0.065)	(0.105)
Marginal Effects	-0.014	0.09	0.176
	0.042	0.07	0.124
Observations	385	385	385

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table above. Marginal effects are calculated from the Kennedy (1981) equation.

APPENDIX F

REGRESSION RESULTS FROM 1992-2012 DROP MLS WEIGHT BY POPULATION

1992-2012 Drop MLS Counties Weight by Population

VARIABLES	(1) OLS with FE	(2) OLS with FE and Controls	(3) Interactions
Family Income (000)		0.002	0.002
		(0.005)	(0.006)
Percent of Bachelors Degrees		2.973	2.993
		(1.138)***	(1.250)**
Percent of Homes Occupied		0.033	0.027
		(0.209)	(0.239)
White Population Percent		0.121	0.115
		(0.374)	(0.410)
Housing Density		-0.006	-0.006
		(0.002)***	(0.002)***
Rural Percent		-3.405	-3.393
		(1.153)***	(1.151)***
Male Percent		4.603	4.596
		(3.481)	(3.593)
School Age Percent		3.775	3.793
		(1.238)***	(1.259)***
Percent of land in Agriculture		-0.054	-0.054
		(0.132)	(0.128)
New Mexico Linear Trend		-4.072	-4.068
		(3.789)	(3.851)
Idaho Linear Trend		-0.200	-0.199
		(0.046)***	(0.056)***
Utah Linear Trend		-0.120	-0.118
		(0.044)***	(0.055)**
Disclosure	0.266	-0.075	
	(0.055)***	(0.080)	
Disclosure Marginal Effects	0.302	-0.076	
	(0.072)***	(0.074)	
Observations	385	385	385
R-squared	0.999	1.000	1.000

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

1992-2012 Drop MLS Weight by Populations

Variables	(1) 1997	(2) 2007	(3) 2012
New Mexico Year Interaction	-0.003	-0.075	-0.069
	(0.052)	(0.082)	(0.130)
Marginal Effects	-0.004	-0.076	-0.074
	(0.052)	(0.075)	(0.120)
Observations	385	385	385

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table above. Marginal effects are calculated from the Kennedy (1981) equation.

APPENDIX G

REGRESSION RESULTS FROM 1992-2012 DROP MLS NON PROPERTY TAX

1992-2012 Drop MLS Non-Property Tax

VARIABLES	(1) OLS with FE	(2) OLS with FE and Controls	(3) Interactions
Family Income (000)		0.006	0.005
		(0.003)**	(0.003)*
Percent of Bachelors Degrees		1.584	1.700
		(0.561)***	(0.596)***
Percent of Homes Occupied		-0.357	-0.404
		(0.238)	(0.279)
White Population Percent		-0.520	-0.657
		(0.285)*	(0.317)**
Housing Density		-0.004	-0.004
		(0.001)***	(0.001)***
Rural Percent		-2.758	-2.715
		(0.492)***	(0.513)***
Male Percent		0.888	0.795
		(1.157)	(1.158)
School Age Percent		1.869	2.035
		(0.652)***	(0.668)***
Percent of land in Agriculture		-0.294	-0.292
		(0.117)**	(0.116)**
New Mexico Linear Trend		0.732	0.714
		(0.080)***	(0.079)***
Idaho Linear Trend		0.677	0.814
		(0.081)***	(0.089)***
Utah Linear Trend		0.725	0.864
		(0.081)***	(0.088)***
Disclosure	0.355	0.227	
	(0.035)***	(0.055)***	
Disclosure Marginal Effects	0.425	0.253	
	(0.049)***	(0.069)***	
Observations	385	385	385
R-squared	0.999	1.000	1.000

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1 Standard errors are calculated from the Hsiang (2010) method. County and year fixed effects are included in the model but not shown.

1992-2012 Drop MLS Non-Property tax

	(1)	(2)	(3)
Variables	1997	2007	2012
New Mexico Year			
Interaction	-0.127	0.371	0.595
	(0.065)*	(0.057)***	(0.066)***
Marginal Effects	-0.121	0.446	0.808
	(0.057)*	(0.083)***	(0.119)***
Observations	385	385	385

Note: Standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1
Standard errors are calculated from the Hsiang (2010) method. Interaction coefficients come from model 5 of table above. Marginal effects are calculated from the Kennedy (1981) equation.