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The Legal Salience of Taxation

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THE LEGAL SALIENCE OF TAXATION

Andrew T. Hayashi *

The enforcement of tax laws affects the distribution of tax burdens. Many tax enforcement regimes incorporate taxpayer-initiated administrative procedures for adjusting tax liabilities. For these procedures, individual decisions to seek administrative relief are the first causal link in the chain of actions leading to tax adjustments, decisions that can be driven by factors that are arbitrary from the perspective of the tax law and vary across individuals, effectively resulting in heterogeneous enforcement. This effect can undermine the fairness and efficiency of the tax system, but has been largely ignored. Using a novel dataset, I study the property tax appeals process and find that the salience of the property tax has a large effect on the probability of appealing. Although tax scholars have studied market and political responses to tax salience, I report the first evidence of how salience affects individuals' use of the legal system and introduce the concept of "legal salience." I find that legal salience heterogeneity, unwittingly induced by government policy and private actors, effectively shifts the property tax burden in New York City toward certain mortgagors, who are more likely to be racial minorities, foreign-born, and working families with children. I argue that because enforcement effects can cause the actual assignment of tax liabilities to differ from the assignment stipulated under the law, tax laws should be evaluated in light of the pattern of enforcement that can reasonably be expected to arise rather than under an assumption of perfect enforcement.

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INTRODUCTION

Governments can usually tax only what they can observe or measure, things like income, property value, and the sale of goods or services. This is an unfortunate limitation of the world we live in because prominent theories of optimal taxation recommend taxing (mostly) unobservable individual characteristics such as “ability to pay.”¹ Attempts to tax these characteristics indirectly involve taxing measurable quantities such as income, which only imperfectly echoes ability to pay and is subject to taxpayer manipulation because income is a function of effort, as well as latent talent.² However, recent legal scholarship has proposed ways that tax policy can take into account unobservable, but normatively relevant, taxpayer characteristics. Presenting taxpayers with choices from menus of alternatives can cause them to reveal information about themselves through those choices. That information can be used to improve tax compliance targeting strategies,³ or to tailor tax law itself.⁴ What has gone largely

¹ See, e.g., Noel B. Cunningham & Deborah H. Schenk, *The Case for a Capital Gains Preference*, 48 TAX L. REV. 319, 364 (1992) (“Most commentators believe that the [tax] base should reflect relative ability to pay.”) Some argue that conditioning local tax liability on income has limited redistributive benefits and negative efficiency effects arising from the taxpayers’ ability to relocate, and that local governments should rely on benefits taxes and leave ability-to-pay taxes to higher levels of government. See WALLACE E. OATES, *FISCAL FEDERALISM* (Harcourt Brace Jovanovich Inc. 1972); GEORGE BREAK, *FINANCING GOVERNMENT IN A FEDERAL SYSTEM* (The Brookings Institution 1980); Daniel L. Rubinfeld, *Tax Assignment and Revenue Sharing in the United States*, in TAX ASSIGNMENT IN FEDERAL COUNTRIES (Charles E. McLure, Jr. ed., 1983). But see Timothy J. Goodspeed, *A re-examination of the use of ability to pay taxes by local governments*, 38 J. PUB. ECON. 319 (1989) (arguing that welfare losses from migration are small and redistribution is possible).

² The possibility of manipulation creates equity/efficiency tradeoffs in income taxation that are well-studied. See, e.g., Joseph Stiglitz, *Pareto Efficient and Optimal Taxation and the New Welfare Economics*, in HANDBOOK OF PUBLIC ECONOMICS 91 (Alan J. Auerbach & Martin Feldstein, eds., 1987); David A. Weisbach, *Toward a New Approach to Disability Law*, 2009 U. CHI. LEGAL F. 47, 74 (2009) (discussing problem of high ability individuals mimicking low ability individuals through manipulation of work effort).

³ See Alex Raskolnikov, *Revealing Choice: Using Taxpayer Choice to Target Tax Enforcement*, 109 COLUM. L. REV. 689 (2009).

⁴ See Lee Anne Fennell, *Willpower Taxes*, 99 GEO. L.J. 1371 (2011). The related idea that contractual default terms can be set so that parties opting out reveal information about themselves was articulated by Ian Ayres and Robert Gertner. Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 97 (1989). Bradley Karkkainen has made similar arguments in administrative law. Bradley C. Karkkainen, *Adaptive Ecosystem Management and Regulatory Penalty Defaults: Toward a Bounded Pragmatism*, 87 MINN. L. REV. 943, 970–75 (2002) (describing value of penalty defaults in regulatory context). This literature exploits results from economics, where this approach to overcoming informational asymmetries goes under the name of “screening.” The economics literature has long recognized that the self-selection of individuals into certain social programs, on the basis of unobservable characteristics, can “tag” them in an informative way that can be used to make redistributive policies more efficient. See George A. Akerlof, *The Economics of “Tagging”*

unnoticed is that systems of tax enforcement already account for unobservable taxpayer characteristics, unwittingly, by providing for administrative procedures that are unequally utilized by different kinds of taxpayers for idiosyncratic reasons. One such reason is tax salience.

The salience of a tax generally refers to the effect of its visibility or prominence on the decision making of taxpayers.⁵ This emphasis on a tax's visibility or prominence distinguishes salience from other psychological reasons, such as complexity, why a tax may have a greater or lesser effect than one might expect based on its magnitude. The visibility or prominence of a tax can be manipulated by altering the way that the tax is presented. For example an excise tax that is reflected in the list price of an automobile may be more visible at the time of purchase than a personal property tax, of equal size, that is imposed at some later date. Tax salience can also be affected by the way that the tax is collected. Milton Friedman famously regretted his role in introducing income tax withholding, believing that it reduced the salience of the income tax, which in turn reduced individuals' resistance to the tax and facilitated the growth of government.⁶

Thus defined, the concept of tax salience is inextricably linked to taxpayers' decisions. The effect of tax visibility or prominence on economic decisions (such as how much to buy, invest or work) has been referred to as its "market salience" and the effect on individuals' political decisions (such as whether to oppose the tax through voting, lobbying, etc.) is called its "political salience."⁷ Recent scholarship, discussed in Section I.A, explores these two kinds of tax salience. In this Article, I identify the effect of tax salience on the decision

as Applied to the Optimal Income Tax, Welfare Programs, and Manpower Planning, 86 AM. ECON. REV. 8 (1978). David Weisbach has noted that the optimal tax literature views optimal taxation as fundamentally a screening problem. *See* Weisbach, *supra* note 2, at 74; Stiglitz, *supra* note 2; Jeff Strnad, *The Progressive Puzzle: The Key Role of Personal Attributes*, John M. Olin Program in Law and Economics Working Paper No. 293, 2004).

⁵ Deborah H. Schenk, *Exploiting the Salience Bias in Designing Taxes*, 28 YALE J. ON REG. 253, 262 (2011) ("With respect to taxation, salience is used to describe the degree to which a tax or a tax provision is visible or prominent to the public.") I adopt this definition, because of its specificity about the reason why the decision weight of the tax may vary. For a broader definition, *see* David Gamage & Darien Shanske, *Three Essays on Tax Salience: Market Salience and Political Salience*, 65 TAX L. REV. 19, 23 (2011) ("As we use the term, 'tax salience' refers to the extent to which taxpayers account for the costs imposed by taxation when the taxpayers make decisions or judgments.") This latter definition roughly describes what Xavier Gabaix and David Laibson refer to as a "shrouded attribute." Xavier Gabaix & David Laibson, *Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets*, 121 Q.J. ECON. 505, 512 (2006) ("shrouded attributes are not taken into consideration by some potential customers.")

⁶ MILTON FRIEDMAN & ROSE FRIEDMAN, *TWO LUCKY PEOPLE* 123 (University of Chicago Press, 1998).

⁷ Gamage & Shanske, *supra* note 5. Sometimes "market salience" is referred to as "economic salience." I choose the first convention because I construe the term "economic" to include non-market behavior.

to use the legal system. I thereby introduce a new, third category to the taxonomy of tax salience effects, which I term “legal salience,” and I provide empirical evidence that the salience of a tax can have a significant effect on the use of administrative procedures.

Specifically, I examine the effect of property tax salience on the use of the assessment appeals process in New York City using a novel dataset created for the purpose of this analysis. Constructing this dataset, which involved merging data from five different sources and the collection of nearly two million individual property tax bills, permitted me to analyze the behavior of individual taxpayers over time and thereby control for many of the factors that would otherwise confound attempts to identify the effects of tax salience. These tax bills provide information about how the presentation and collection of the property tax varies across property owners. Some owners receive a bill and remit their property tax payments directly to the city, while others make contributions to an escrow account as part of their monthly mortgage payments, out of which taxes are paid on the property owner’s behalf. Those using escrow do not receive a bill from the city and their tax payments are folded into a monthly payment to their mortgage servicer that includes mortgage principal, interest, and insurance components. These differences make the tax less visible or prominent for property owners using escrow and make those owners less likely to appeal their taxes. After reporting evidence of the existence of legal salience and the characteristics of property owners who use escrow, I place legal salience in a broader context as one of several sources of taxpayer heterogeneity (*i.e.*, differences among taxpayers) that affect tax enforcement and, in turn, the distribution of the tax burden, but are untethered to any normative theory of taxation. I argue that tax laws should be evaluated in light of the pattern of enforcement that can reasonably be expected to arise rather than under an assumption of perfect enforcement.

This Article makes two contributions to the tax literature. First, scholarship on the effects of tax salience has focused almost exclusively on market responses and political responses to tax salience.⁸ I identify the use of administrative remedies as a third way in which individuals might respond to tax salience and provide empirical evidence that they do respond in this way. I find large and statistically significant positive effects of tax salience on the likelihood of using the property assessment appeals process. By comparison, increasing the

⁸ Some scholarship doesn’t fit snugly into these two categories. *E.g.*, Yair Listokin & Jacob Goldin, *Tax Expenditure Salience*, (unpublished manuscript, July 2, 2012) (reporting evidence on salience of charitable deduction and home mortgage interest deduction); Brian Galle, *Federal Fairness to State Taxpayers: Irrationality, Unfunded Mandates, and the “SALT” Deduction*, 106 MICH. L. REV. 805, 824-830 (2008) (noting that tax salience may affect relocation decisions); Sebastien Bradley, *Property Tax Salience and Payment Delinquency* (unpublished manuscript, May 2012) (reporting evidence that reduced property tax salience increases likelihood of late payments, underpayments and interest penalties).

salience of the property tax has the same effect on the likelihood that a property owner will appeal as increasing the benefits from a successful appeal by \$7,000.⁹ I also embed my empirical analysis of tax salience within a simple economic model of the decision to seek administrative relief. Including a theoretical framework enhances the credibility of my findings and illustrates how organizing empirical analysis around a model of the individual's decision process makes it easier to interpret the results and inform policy recommendations.¹⁰ I hope that the framework will be useful to scholars interested in examining the effect of legal salience on the use of administrative remedies in other contexts.

Second, legal salience varies across taxpayers. The central problem, and opportunity, posed by legal salience heterogeneity is the effect it has on the distribution of the tax burden, shifting tax liability from taxpayers for whom the tax is more salient ("high-salience taxpayers") to those for whom the tax is less salient ("low-salience taxpayers") because high-salience taxpayers are more likely to seek relief from the burden of the tax.¹¹ Because its importance has not generally been appreciated, this effect is unintended and may be at cross purposes with the goals of the tax system. Armed with an accurate understanding of what motivates people to seek administrative remedies, processes for seeking relief can be designed to further, rather than undermine, those goals. Most scholarship has given the issue of tax salience heterogeneity short shrift, largely because of empirical limitations in identifying why tax salience varies and the characteristics of high- and low-salience taxpayers. In this Article, I identify both. I find that mortgage escrow, historically required of certain borrowers by mortgage lenders and recently mandated by federal regulations for individuals receiving "higher-priced" loans, has the unintended effect of reducing tax salience for those borrowers.¹² Because low-salience taxpayers are more likely to remain over-assessed, I find that, as a practical matter, New York City's assessment appeals process likely results in heavier property tax burdens for homeowners who use mortgage escrow. These homeowners tend to be racial minorities, foreign-born,

⁹ For the computation of this number, see the discussion of coefficient magnitudes on page 37.

¹⁰ By specifying a model before looking at the data, I both motivate and discipline the empirical analysis. The model motivates the analysis by suggesting which variables are relevant to the decision and facilitating the interpretation of the empirical results. Specifying which variables are relevant in the decision to seek administrative relief also constrains the empirical analysis in a desirable way. Without specifying a theoretical foundation for the selection of variables and the way that they affect the appeals decision, the temptation can be great for researchers to experiment with many combinations of variables in order to find statistically significant effects, potentially leading to spurious findings.

¹¹ The "shift" occurs through anticipatory rate increases under New York's property tax, and through more indirect measures under other regimes. See discussion *infra* II.A.3, note 112 and accompanying text.

¹² See *supra* text accompanying notes 35-37.

and working families.¹³ Although I cannot make a general claim about the distributional effects of legal salience heterogeneity, because its causes and the relationship between those causes and taxpayer characteristics vary across contexts, my results show that legal salience heterogeneity is a potential problem that should be considered in rule or administrative changes that affect legal salience.

The case of New York's property tax also illustrates concerns common to any enforcement regime that relies on individual reporting. Taxpayers will tend to report over-assessments only when the tax savings from doing so will outweigh the costs to them of using the appeals process. This means that the use of the appeals process is likely to vary across people because of variables that are arbitrary from the perspective of the law but that affect the perceived costs and benefits of appealing. These include differences in taxpayers' awareness of the appeals system, their abilities to argue their cases before the appeals tribunal or hire expert counsel, and the costs of pursuing an appeal. I report evidence that using mortgage escrow makes a property owner less likely to appeal and therefore more likely bear a heavier tax burden than they would be if they did not use escrow. It is hard to imagine a more arbitrary determinant of property tax liability than the use of mortgage escrow.

The question of how salience affects the use of administrative remedies in tax law provides an entry point into a broader research agenda. Specifically, one can apply the lessons from this paper to understand how idiosyncratic differences between individuals affect their use of administrative processes and, consequently, the *de facto* allocation of social benefits and burdens. In the modern administrative state, there are innumerable opportunities for citizens to affect their

¹³ A system in which the use of potentially tax-reducing administrative procedures is motivated by factors unrelated to the underlying merits of the case can introduce horizontal and vertical inequities. For evidence of variation in property tax burdens across income groups and property values, see G. Stacy Sirmans, Dean Gatzlaff & David Macpherson, *Horizontal and Vertical Inequity in Real Property Taxation*, 16 J. REAL EST. LIT. 167 (2008) (summarizing literature finding horizontal inequity arises from unequal knowledge of market participants, unequal negotiating skills of buyers and sellers, and actions by officials to limit property tax increases); Marcus Allen & William Dare, *Identifying Determinants of Horizontal Property Tax Inequity: Evidence from Florida*, 24 J. REAL EST. RESEARCH 153 (2002); Kenneth Baar, *Property Tax Assessment Discrimination Against Low Income Neighborhoods*, 13 URB. LAW. 333 (1981) (describing widespread assessment discrimination); Keith Ihlanfeldt, *Property Tax Incidence on Owner-Occupied Housing: Evidence from the Annual Housing Survey*, 35 NAT'L TAX J. 89 (1982); Daniel McMillen & Rachel Weber, *Thin Markets and Property Tax Inequities: A Multinomial Logit Approach*, 61 NAT'L TAX J. 653 (2008) (reporting evidence that sales frequency affects uniformity of assessment ratios). In the case of the property tax, horizontal inequities are differential rates of taxation for properties identical in all relevant dimensions and vertical inequities are "inappropriate" patterns of tax differentiation among dissimilar properties. For general definitions of these terms, see Louis Kaplow, *Horizontal Equity: Measures in Search of a Principle*, 42 NAT'L TAX J. 139, 140 (1989); Richard A. Musgrave, *Horizontal Equity, Once More*. 43 NAT'L TAX J. 113, 113 (1990).

shares of these allocations through savvy use of such procedures. These opportunities are not forced upon citizens; they must be pursued, and individuals are differentially situated in their abilities to obtain them. In the federal income tax context, taxpayers may appeal determinations of tax deficiencies or proposed adjustments to a tax return, seek relief from joint and several liability between married taxpayers, challenge the imposition of tax liens, amend a prior year's return, or settle an outstanding tax liability for less than its face amount. For households, claiming any of a variety of refundable tax credits, such as the earned income tax credit, child tax credit, American Opportunity Credit or the 2007 economic stimulus payment all require filing a federal income tax return, which many households do not do. Similar issues arise for business organizations and in the state and local tax contexts. This is just the (tax) tip of the regulatory iceberg, and I suggest a select few topics of potential research interest in Part III.

The remainder of this Article is structured as follows. Part I introduces the concept of legal salience and discusses the causes and consequences of legal salience heterogeneity. Part II presents an empirical study of legal salience that examines its effect on property tax appeals in New York City. I begin the study by describing the institutional context in which appeals are made. I then present a theoretical framework of the decision to seek administrative relief, the data collection process, and the results of the empirical analysis. Part III provides an illustrative analysis of how legal salience heterogeneity affects tax enforcement and the distribution of the tax burden, which helps identify relevant considerations for evaluating the effects of legal salience in other contexts. I identify some of these contexts before concluding.

I. LEGAL SALIENCE AND TAXPAYER HETEROGENEITY

When the government burdens an activity by subjecting it to a tax or regulation, there are at least three ways that people with a preference for that activity can respond: by doing less of it, by lobbying elected officials to change the law (or replacing those officials with others more sympathetic to their plight), or by using whatever legal means are available to reduce the weight of that burden. The burgeoning literature on tax salience has explored how the first two kinds of decisions are sensitive to the visibility or prominence of a tax, *i.e.*, the market salience and the political salience of the tax. In Section I.A, I summarize this literature and introduce “legal salience” as a third category of tax salience responses. Of course, the salience of taxes and regulations are not the same for all people. Although this has been acknowledged, most scholarship on tax salience has implicitly assumed that taxes either are salient or they are not, without attending to the potential implications of tax salience heterogeneity across taxpayers. In Section I.B, I describe some of the causes and consequences of tax salience heterogeneity. This discussion frames the empirical study of property tax

appeals in Part II, in which I identify the specific cause and consequences of salience effects in that context.

A. *Three Categories of Tax Salience Effects*

The notion that taxpayers respond differently to taxes depending on how salient those taxes are to them has generated a growing area of research in economics and law. Because less salient taxes induce smaller behavioral responses than more salient taxes, the salience of a tax can have economic incidence and welfare consequences.¹⁴ In the political arena, tax salience could plausibly influence the choice of tax instruments and tax rates by elected officials. Empirical research in economics has identified some of these effects. Legal scholarship has observed these findings, demarcated the concept of tax salience into the categories of market salience and political salience, and explores some of their normative implications.¹⁵

1. Market Salience

The market salience of a tax refers to the effect of its visibility or prominence on market decisions, such as whether to buy a particular good, invest in a particular asset, or accept a particular job. Researchers have taken one of two approaches to identifying the effect of salience. The first is to directly manipulate features of the tax that are presumed to affect its visibility or prominence. For example, one might increase the salience of a sales tax that is imposed at checkout by labeling items with the tax-inclusive price or by dividing the tax-inclusive price into its components parts and highlighting the tax component by underlining it or presenting it in bold. This approach assumes that the manipulation of the presentation of the tax affects its salience alone, but not any other characteristics that people think are relevant to the decision. Under the second approach, salience effects are inferred when a tax has a different effect on behavior than some other, economically equivalent, component of the price. For example, if consumers' demand for an item responds less to an increase in its price that is attributable to a change in the sales tax than to an economically equivalent increase in its pre-tax price, then one might infer that the sales tax was less salient. This interpretation has certain problems, however, because there are other explanations for why

¹⁴ See, e.g., Raj Chetty, *The Simple Economics of Salience and Taxation*, (Nat'l Bureau of Econ. Research, Working Paper No. 15246, 2009) (finding that incidence of a tax depends on its statutory incidence and that tax can create deadweight loss even if it induces no change in demand); Jacob Goldin, *Optimal Tax Salience*, (unpublished manuscript, February 2012) (exploring optimal mix of high and low salience taxes.)

¹⁵ Schenk, *supra* note 5; Gamage & Shanske, *supra* note 5.

“partitioning” a price into a tax and non-component could affect the demand for a good, such as a general aversion to price complexity or distaste for taxes.¹⁶

Although there remains work to be done in distinguishing salience effects from other effects of price presentation and identifying the contextual factors that affect the salience of a tax, there is already a growing body of empirical research documenting what appear to be significant tax salience effects. In a widely cited study, Raj Chetty, Kory Kroft and Adam Looney report evidence that consumers are less likely to purchase certain items when prices inclusive of sales tax are posted alongside those items than when only the pre-tax price is visible, even if consumers know the amount of sales tax that will be imposed at checkout.¹⁷ They also find that consumer demand is more responsive to increases in the rate of an excise tax, which is reflected in the posted purchase price, than an increase in the rate of a sales tax, which is imposed at the register upon checkout.¹⁸

In another oft-cited paper, Amy Finkelstein reports evidence that highway tolls are less salient and have less of an effect on the use of the highway when they are paid by automatic electronic billing (EZ-Pass collection) than when paid in cash.¹⁹ Evidence of market salience effects has also been reported for automobile purchasing decisions, which do not always properly account for the effects of personal property taxes or tax credits,²⁰ and labor supply decisions, which are affected by whether the worker is subject to a wage tax or an economically equivalent consumption tax.²¹ Personal property taxes, tax credits, and consumption taxes are imposed subsequent to the time of the purchase or labor supply decision and are, for this reason, arguably less salient when those decisions are made and therefore less likely to be fully incorporated into the cost/benefit calculus than tax imposed at the same time as the decision.

¹⁶ See Andrew Hayashi, Brent K. Nakamura & David Gamage, *Experimental Evidence of Tax Salience and the Labor-Leisure Decision: Anchoring, Tax Aversion, or Complexity*, PUB. FIN. REV. (forthcoming).

¹⁷ Raj Chetty, Adam Looney & Kory Kroft, *Salience and Taxation: Theory and Evidence*, 99 AM. ECON. REV. 1145 (2009).

¹⁸ *Id.*

¹⁹ Amy Finkelstein, *EZ-Tax: Tax Salience and Tax Rates*, 124 Q.J. ECON. 969 (2009).

²⁰ Richard L. Ott & David Andrus, *The Effect of Personal Property Taxes on Consumer Vehicle-Purchasing Decisions: A Partitioned Price/Mental Accounting Theory Analysis*, 28 PUB. FIN. REV. 134 (2000); Kelly Sims Gallagher & Erich Muehlegger, *Giving Green to Get Green? Incentives and Consumer Adoption of Hybrid Vehicle Technology*, 61 J. ENVTL. ECON. & MGMT. 1 (2011).

²¹ Tomer Blumkin, Bradley Ruffle & Yosef Ganun, *Are Income and Consumption Taxes Ever Really Equivalent? Evidence from a Real-Effort Experiment with Real Goods*, (Center for Economic Studies, Working Paper No. 2194, 2008) (finding a significantly greater effect of an income tax on labor supply than an economically equivalent consumption tax).

2. Political Salience

The political salience of a tax refers to the effect of its visibility or prominence on political decisions. The interaction between political salience in the minds of voters and in the minds of politicians, the degree to which the latter depends on the former, and the way in which the two generate observable political outcomes is extremely complicated and largely the basis of conjecture. However, there is some suggestive evidence, and good intuition, that tax policy reflects salience effects.²²

Amy Finkelstein reports evidence that politicians set higher highway toll rates when those tolls are collected electronically (and, presumably, with less salience) than when collected by cash payment. Finkelstein also reports that tolls are less likely to increase during election years when tolls are collected by cash than when they are collected electronically, suggesting that the political costs of raising tolls may be reduced when those tolls are less salient. Marika Cabral and Caroline Hoxby studied whether the salience of the property tax affects two political outcomes: the existence of state-level statutory limitations on property taxes and overall property tax rates. Controlling for a number of demographic and financial variables, they estimate that greater utilization of mortgage escrow, which appears to reduce the salience of the property tax, is associated with higher property tax rates and fewer state-level limits on property taxes. These effects presumably result from reduced political opposition to the property tax.²³

Recent legal scholarship has evaluated the propriety of using tax salience as an instrument for helping tax policy become more equitable, efficient, and effective at raising revenue. Deborah Schenk argues that there are circumstances in which it is appropriate for the government to exploit the fact that certain taxes have low political salience.²⁴ For example, politically non-salient taxes may generate less resistance from voters during periods of general anti-tax sentiment, making salience a potentially valuable policy instrument during times in which it is difficult to raise revenue and the government is facing the prospect of a fiscal crisis. David Gamage and Darien Shanske also argue that categorical objections to reducing political salience are misguided, finding that democratic values do not necessitate more politically salient taxes.²⁵

²² Aradhna Krishna and Joel Slemrod argue that, in many settings, the tax system is designed to minimize the perceived tax burden, but that in some situations the system serves to maximize the perceived burden on high-income families. See Aradhna Krishna & Joel Slemrod, *Behavioral Public Finance: Tax Design as Price Presentation*, 10 INT'L TAX & PUB. FIN. 189 (2003).

²³ Marika Cabral & Caroline Hoxby, *The Hated Property Tax: Salience, Tax Rates, and Tax Revolts*, (unpublished manuscript, 2010).

²⁴ Schenk, *supra* note 5.

²⁵ Gamage & Shanske, *supra* note 5.

3. Legal Salience

In many contexts we observe taxpayers reacting to a tax economically, by changing the consumption or investment decisions that are taxed, or politically, by supporting elected officials whose fiscal policies reflect the taxpayers' preferences. There is a third context in which taxpayers can take actions that affect their tax liability. Many tax regimes, such as federal and state income taxes and local property taxes, are enforced by administrative agencies that have processes for challenging, appealing, or otherwise adjusting taxpayer liabilities after they have been initially assigned. Such processes are often initiated by the taxpayers themselves, in which case the pattern of use will reflect the idiosyncratic cost/benefit calculus of those taxpayers, incorporating their own beliefs, preferences and circumstances. For a variety of psychological and economic reasons, some people are more likely to utilize legal processes and institutions than others. Such differences can create the potential for disparate effects for even a facially nondiscriminatory procedure.

As I show in Part II, the visibility or prominence of a tax affects the likelihood that taxpayers will seek administrative remedies to reduce its burden. This is the legal salience of the tax. There is no necessary connection between the legal salience, market salience, and political salience of a tax. In particular, a tax that is salient for the purpose of market decisions may not be salient for political or legal decisions. This is because taking a political or legal action to mitigate the effect of a tax requires more information than taking a market action. Consider the case of an excise tax, which is equal to a fixed amount per unit of the good or service sold. An excise tax is generally incorporated into the price of the good or service presented to the consumer and, consequently, has high market salience. All that the consumer needs to know in order to respond optimally to the tax via her purchasing decisions is reflected in the price of the good. It doesn't matter what portion of the price is attributable to the tax, what portion is attributable to the seller's costs, or what portion is attributable to the seller's profit. Put differently, a consumer's market choices will generally respond in the same manner to a fully salient tax increase and an economically equivalent price increase that benefits the seller. This will not be true of the taxpayer's political or legal decisions, because a tax will not prompt a taxpayer to seek political or legal remedies unless it is identified as a tax.

This distinction is especially pertinent in the context in which I study legal salience. I identify the effect of property tax salience on the willingness of taxpayers to appeal their assessments using a causal identification strategy based on evidence reported by Marika Cabral and Caroline Hoxby,²⁶ who provide

²⁶ Cabral & Hoxby, *supra* note 23. The first to speculate about the effect of mortgage escrow on tax salience was Peter Ordeshook. See Peter C. Ordeshook, *Property Tax Consciousness*, 34 PUB. CHOICE 285 (1979). Ordeshook surveyed 320 taxpayers and found no statistically significant

survey results suggesting that the manner by which the property tax is paid affects its salience. Property taxes are less salient for owners whose property taxes are included in the monthly mortgage payments made to their mortgage servicer. Property taxes are more salient for owners that pay the tax directly to the taxing authority.²⁷ This finding has some intuitive appeal. Mortgagors typically make monthly payments to their mortgage servicers that include escrow contributions for mortgage and homeowners' insurance, principal and interest, and property taxes. By lumping all of these costs together into a single payment that is made to the mortgage servicer rather than the final recipients, and by disaggregating what would generally be quarterly, semi-annual or annual property tax payments into smaller, monthly payments, the purpose of the payment is obscured and the shock of a large property bill is avoided.²⁸ Because it consolidates property taxes with principal, interest, and insurance obligations, escrow obscures the components of the monthly payment and therefore the legal and political decisions that could be made to reduce property tax liability, thereby reducing legal salience. My analysis examines the relationship between the use of mortgage escrow, as a cause of tax (non)salience, and the probability of filing an appeal, appropriately controlling for other factors affecting the appeals decision.

There have been only two empirical studies of the role of assessment appeals. These studies show that tax appeals are correlated with neighborhood characteristics such as home values, the proportion of homeowners, and the share of African American and Hispanic residents.²⁹ Neither of these studies, however, examines the effect of property tax salience on assessment appeals. Although any arbitrary factor driving the decision to use administrative procedures merits scrutiny for its distributional consequences, the visibility or prominence of a tax, its salience, is a good place to start from a policy perspective because it is more easily manipulated by regulators than, for example, the opportunity cost of taxpayers' time or other individual-specific factors that affect the appeals

relationship between the taxpayers' error in recalling their property tax liability and whether they pay taxes out of escrow, after controlling for income and education. However, the data limitations and comparatively rudimentary empirical analysis caution against drawing strong conclusions from this study.

²⁷ Homeowners with tax escrow report their taxes with greater error than those without, although this error is unbiased. Cabral & Hoxby, *supra* note 23, at 29-30.

²⁸ Although forthcoming regulations may require servicers to provide statements indicating to borrowers the portion of their monthly payments that is allocated to each of these costs, this has not been standard practice. See discussion *infra* p. 33.

²⁹ Rachel N. Weber & Daniel P. McMillen, *Ask and Ye Shall Receive? Predicting the Successful Appeal of Property Tax Assessments*, 38 PUB. FIN. REV. 74 (2010); William M. Doerner & Keith R. Ihlanfeldt, *An Empirical Critique of the Property Tax Appeals Process*, (unpublished manuscript, January 2012). Weber and McMillen also report evidence that a reduced likelihood of appeal is associated with higher frequencies of local sales or a recent sale of the property itself, suggesting that a richer informational environment could reduce the frequency of appeals, by increasing assessor accuracy and property owners' knowledge of the local housing market.

decision. If the mechanism for manipulating legal salience is known by the tax authority, then there is the opportunity to use that mechanism to ensure that distributional objectives are not undermined by the inequitable use of administrative procedures. If that mechanism is not known, then legal salience may vary in an unpredictable and irremediable way across taxpayers, affecting the allocation of the tax burden. This is the topic of the next section.

B. Taxpayer Heterogeneity

Taxpayers differ in all sorts of ways. They vary in their preferences for consumption, saving and investment; they differ in their personalities, abilities, patience, and willpower; they possess disparate beliefs about the past and their future prospects; and they live in widely divergent circumstances. Such differences provide information that we might like to use in setting tax policy, both because they could provide normative justification for redistribution and because they affect how much revenue can be raised while minimizing inefficiencies associated with behavioral distortions. However, many of these taxpayer characteristics are, as a practical if not theoretical matter, unobservable. Tax liability can generally only be assigned on the basis of observable or measurable characteristics.

When unobservable characteristics differ between taxpayers who are identical along the observable dimensions that the tax law takes into account, apparent inequities can arise through tax enforcement.³⁰ For example, variation in the legal salience of the property tax across homeowners can result in two properties, identical in every dimension specified under the law, to be taxed at different rates if one homeowner makes use of administrative procedures that reduce her tax burden while the other does not. Recent scholarship has argued that unobserved taxpayer heterogeneity presents opportunities as well as challenges for tax policy.³¹ In some circumstances, taxpayers can be induced to reveal information about themselves by selecting from among a menu of tax policy options, and that these options can be tailored to the taxpayers that would choose them. Whether such an approach is necessary, or if there are instead more direct options for dealing with heterogeneity, depends on the underlying causes of that heterogeneity. In this section I describe some of the causes of legal salience heterogeneity and discuss its implications.

³⁰ How inequitable one finds this result may depend on how well the observable factors specified by law capture the characteristics that provide the normative basis for taxation and what effects the unobservable characteristics have on the distribution of the tax burden.

³¹ *See infra* p.18.

1. Causes of Tax Salience Heterogeneity

The salience of a tax depends on (1) characteristics of taxpayers themselves, (2) the way that the tax is imposed by the government, and (3) the interventions of private market actors. Consequently, a tax may be more salient for certain taxpayers than others because they have different characteristics (such as tax sophistication), because the tax is presented differently by the government, or because market actors vary in whether they take actions that heighten or diminish the prominence of the tax. Understanding how these factors interact is essential for identifying how legal salience affects the allocation of the tax burden and what tools are available for changing it. “Tax salience heterogeneity” simply refers to the variation in the visibility or prominence of a tax across taxpayers, for any of these reasons.

To the limited extent that it has been discussed in the literature, tax salience heterogeneity has generally been identified with differences in taxpayers themselves. For example, Brian Galle identifies the opportunity cost of taxpayers’ time, their preferences for current consumption and saving, and the cognitive abilities required to calculate the effects of taxes on after-tax prices, as factors that vary across taxpayers and affect market salience.³² These factors affect the cognitive costs and benefits of taking taxes into account when making market decisions and thereby affect the likelihood that they will affect behavior. For some taxpayers, taxes are ignored because it is rational to do so (in light of the costs of performing the necessary calculations). Other taxpayers neglect the effects of taxes because they are unaware of those effects, not because they deliberately decide not to compute them. For these taxpayers, other factors, such as the ability to pay for professional assistance in tax planning, play important roles in determining tax salience.³³

Differences in the way that a tax is imposed or collected can also create tax salience heterogeneity. For example, collecting tolls for some highways electronically but tolls for other highways in cash will make the toll less salient for drivers on the first highway than for drivers on the second (all else equal).³⁴ Collecting income taxes by withholding from some taxpayers and not from others

³² Brian D. Galle, *Hidden Taxes*, 87 WASH. U. L. REV. 59 (2009). Galle notes that if poorer people have higher discount rates they may be more likely to pay the hidden tax as the value of saving what was spent on the tax will be less to them. Similarly, if the calculations are easier for richer people to perform, or they have access to professional counsel that can advise them about tax costs, the tax may be regressive. Jacob Nussim has argued that tax-exclusive pricing shifts the tax burden from the more to the less psychologically biased. See Jacob Nussim, *To Confuse and Protect: Taxes and Consumer Protection*, 1 COLUM. J. TAX L. 218, 245 (2010). See also Gamage & Shanske, *supra* note 5, at 77 (identifying “general cognitive ability” as affecting distribution of tax salience.)

³³ See Galle, *supra* note 32, at 104.

³⁴ Finkelstein, *supra* note 19.

could cause the income tax to be more salient for those not subject to withholding. Requiring some taxpayers to pay their property taxes through escrow accounts, as has recently been done, may make the tax less salient to them than to owners who pay their taxes directly to the local taxing authority. In July 2008, the Federal Reserve Board issued final regulations requiring for the first time that lenders create escrow accounts for certain first lien “higher-priced” loans that are secured by the borrower’s principal residence.³⁵ On March 2, 2011, the Board published proposed rules that would, among other things, lengthen the required escrow period from one to five years (and longer in certain cases, such as when the borrower is delinquent or in default).³⁶ These regulatory changes reflect a trend toward wider use of mortgage escrow.³⁷

Finally, tax salience effects can be created, intentionally or unintentionally, through the decisions of private market actors. Because tax salience has effects on market choices, sellers of taxed goods have incentives to manipulate tax salience in a way that makes their products more attractive, by highlighting tax benefits that can be claimed for a given purchase and downplaying tax costs. For-profit and non-profit entrepreneurs have incentives to increase the salience of tax return filing obligations to potential customers and clients. Vendors of commercial tax preparation software or services have an incentive to encourage individuals to file tax returns, and non-profit groups motivated to increase takeup of the Earned Income Tax Credit (“EITC”) also have an incentive to encourage tax filing by EITC-eligible households. The marketing activities of these actors are driven by their own optimization calculus and, in either case, there will be an element of selectivity in the populations that they target. This selectivity can also create tax salience heterogeneity.

³⁵ “Higher-priced” loans are those with an APR at least 1.5 percentage points greater than an estimate of the average prime lending rate and generally includes so-called sub-prime and Alt-A loans. 12 C.F.R. § 226.35(a)(1) (2008). These regulations amended Regulation Z, the implementing regulation for the Truth in Lending Act, and were issued under the Board’s grant of rulemaking authority under the Home Ownership and Equity Protection Act of 1994.

³⁶ 12 C.F.R. § 226 (2011). The proposed rules implement certain changes to the Truth in Lending Act made by Title XIV of the Dodd-Frank Wall Street Reform and Consumer Protection Act (signed into law July 21, 2010). Sections 1461 and 1462 of Dodd-Frank created new section 129D of the Truth in Lending Act, which generally codifies the Board’s 2008 regulations but also added disclosure requirements, a lengthened required escrow period and increased the threshold APR for jumbo loans to become subject to mandatory escrow.

³⁷ Forcing homeowners to save a portion of their income each month for property tax and insurance payments may make homeowners less likely to become delinquent on these payments. There is evidence that the large lump sum payments can have severe liquidity effects on households that lead to mortgage default. Nathan B. Anderson & Jane K. Dokko, *Liquidity Problems and Early Payment Default Among Subprime Mortgages*, (FEDS working paper No. 2011-09, 2010).

2. Consequences of Legal Salience Heterogeneity

The central problem, and opportunity, posed by legal salience heterogeneity is the effect it has on the distribution of the tax burden. Because its importance has not generally been appreciated, its effects are unintended and may be at cross purposes with some of the goals of the tax system. Armed with an accurate understanding of what motivates people to seek administrative remedies, processes for seeking relief can be designed to further, rather than undermine, those goals. For this study, I was able to observe one cause of reduced legal salience: the use of mortgage escrow. When the cause of salience can be directly manipulated, the remedy for inequitable salience heterogeneity is relatively simple. When the causes are unobservable, designing a system that harnesses those differences in a desirable way is more complicated. However, recent legal scholarship has proposed creative ways that tax design and enforcement can take into account unobservable, but normatively relevant, characteristics by encouraging taxpayer self-sorting into alternative regimes.

Alex Raskolnikov has argued that tax enforcement can exploit differences in taxpayer motivations for compliance by presenting taxpayers with two different enforcement regimes, which are differentially attractive to taxpayers depending on those motivations. For example, a “compliance regime,” characterized by a pro-government presumption for resolving gray areas of the tax law, will be less desirable for aggressive taxpayers whose tax planning involves the exploitation of legal uncertainty than for those taxpayers who do not attempt to exploit this uncertainty. An alternative “deterrence regime” may be more attractive to these aggressive taxpayers, even if it is characterized by higher penalties for tax avoidance. The incentives for compliance in the two regimes can be tailored to have the greatest effect on the sorts of taxpayers that elect to participate in that regime.³⁸ Lee Anne Fennell has noted that willpower heterogeneity among taxpayers suggests that there may be opportunities to introduce elective tax regimes (addressing, for example, sin taxes) that would allow taxpayers to select the tax schedule that best helps them pursue their long-term interests, in light of their particular ability to resist temptation. Like Raskolnikov, Fennell considers “how menus of regulatory bundles that are designed to induce self-sorting could address willpower heterogeneity.”³⁹

³⁸ Raskolnikov, *supra* note 3.

³⁹ Fennell, *supra* note 4. As self-sorting pertains to self-control issues, see Ted O’Donoghue & Matthew Rabin, *Studying Optimal Paternalism, Illustrated by a Model of Sin Taxes*, 93 AM. ECON. REV. PAPERS & PROC. 186 (2003); Jay Bhattacharya & Darius Lakdawalla, *Time-Inconsistency and Welfare* (Nat’l Bureau of Econ. Research, Working Paper No. 10345, 2004); Susanna Estaban, & Eiichi Miyagawa, *Optimal Menu of Menus with Self-Control Preferences* (Columbia Univ. Dep’t of Econ. Discussion Paper No. 0405-11, 2004). See also Lee Anne Fennell, *Revealing Options*, 118 HARV. L. REV. 1399 (2005); Weisbach, *supra* note 2, at 47 (arguing that commodity taxes or in-kind provision of certain goods may be desirable as a component of disability law

Like motivations for tax compliance and willpower, tax salience is heterogeneous and often unobservable to the tax authority, either because it arises from differences in taxpayer characteristics or market innovations that the government is not aware of. However, whereas the use of menus of alternatives to sort taxpayers into different tax treatments on the basis of compliance motives or willpower remains only a possibility, tax enforcement already operates this way, sorting high-salience taxpayers into a group that avails itself of administrative remedies and low-salience taxpayers into a group that does not. Perhaps because this is unintentional, the effects of that sorting on the efficiency and equity of tax law have not been scrutinized.

Unobserved taxpayer heterogeneity affects canonical results in the economic theory of optimal taxation. Louis Kaplow has demonstrated that unobserved differences in taxpayer characteristics can undermine standard arguments for uniform commodity taxation, the efficient provision of public goods and taxation/subsidy for activities generating externalities.⁴⁰ Applying these results in the salience context will require developing an understanding of how salience is correlated with normatively relevant taxpayer characteristics. However, research has only begun to explore the connection between tax salience heterogeneity in market decisions and its relationship with these characteristics.⁴¹

II. A STUDY OF LEGAL SALIENCE: PROPERTY TAX APPEALS

In this Part I present an empirical analysis of the property tax appeals process in New York City that illustrates some of the causes and consequences of legal salience heterogeneity described above. I begin by describing the institutional context in which property tax appeals are made. Understanding these

policy, when disabilities are unobservable). Tax electivity, in general, is a well-studied topic. *See, e.g.,* Heather M. Field, *Choosing Tax: Explicit Elections as an Element of Design in the Federal Income Tax System*, 47 HARV. J. ON LEGIS. 21 (2010); Erzo F.P. Luttmer & Richard J. Zeckhauser, *Schedule Selection by Agents: From Price Plans to Tax Tables 2* (Nat'l Bureau of Econ. Research, Working Paper No. 13808, 2008).

⁴⁰ Louis Kaplow, *Optimal Policy with Heterogeneous Preferences*, 8 B.E. J. ECON. ANALYSIS & POL'Y 1 (2008) (noting that that optimal tax rules in public economics are usually derived in models with homogeneous preferences and exploring how standard results are affected by preference heterogeneity.)

⁴¹ Although the evidence on heterogeneity of cognitive biases and the relationship with income is scarce, *see* Jacob Goldin & Tatiana Homonoff, *Smoke Gets in Your Eyes: Cigarette Tax Salience and Regressivity*, AM. ECON. J.: ECON. POLICY (forthcoming) (reporting evidence that sales taxes imposed at the register are more salient for low income than high income consumers, implying that the optimal rate of a low-salience sales tax imposed at check-out is positive); Sendhil Mullainathan & Eldar Shafir, *Savings Policy & Decision-Making in Low-Income Households*, in INSUFFICIENT FUNDS: SAVINGS, ASSETS, CREDIT AND BANKING AMONG LOW-INCOME HOUSEHOLDS (Michael Barr & Rebecca Blank, eds., 2009); Kelly Shue & Erzo F. P. Luttmer, *Who Misvotes? The Effect of Differential Cognition Costs on Election Outcomes*, 1 AM. ECON. J.: ECON. POL'Y 229 (2009).

details is necessary to formulate a reasonable economic model of the appeals decision, which I provide in Section II.B. This theoretical model incorporates tax salience as a potential determinant of the decision to appeal. In Section II.C I describe how I collected the data to evaluate the theoretical model and my approach for identifying the effect of tax salience on the use of the appeals process. The results from my analysis demonstrate that decreasing tax salience has a large and statistically significant negative effect on the probability that a homeowner will use the assessment appeals process and that other variables that one would expect to affect the appeals decision, such as the potential savings from a successful appeal, have the expected effects.

A. Taxes, Tax Appeals and Mortgage Escrow in New York City

1. Background

In New York City, a property owner's tax liability is the result of a complex computation that incorporates characteristics of the property and its use, characteristics of the owner, the Department of Finance's ("DOF") estimate of the property's market value, and changes in the value of that property in prior years. One of the most important variables in this computation is the property's assessed value. It is this component of the property tax computation that taxpayers can challenge by appealing to the New York City Tax Commission (the "Commission.")⁴² Before turning to a detailed explanation of the appeals process, I begin by providing an explanation of how property tax liabilities are assigned in the first instance, focusing on the "Class 1" properties that are the objects of my empirical analysis.

New York City's fiscal year runs from July 1 to June 30. After the city's budgeted expenditures and non-property tax revenue forecasts for the coming fiscal year have been determined, the difference is the revenue to be raised from property taxes.⁴³ The amount that is billed to property owners is known as the levy, which is equal to the amount of revenue that must be collected plus a reserve for anticipated refunds, current year collections levied in prior years, and uncollectible taxes.⁴⁴ For property tax purposes, real property is divided into four classes: Class 1 includes mainly one-, two- and three-family residential property,

⁴² The Commission also has the authority to change the tax class of the property and any exemptions to which the property is entitled. Nearly all appeals challenge a property's assessed value.

⁴³ CITY OF NEW YORK, DEPARTMENT OF FINANCE, OFFICE OF TAX POLICY, *THE NEW YORK CITY PROPERTY TAX FY 2011 ANNUAL REPORT* (2011) [hereinafter *DOF Property Tax Report*]. Although the property tax appears to be a budget gap-filler under the law, because of political constraints it is rarely used that way. Instead, expenditures are adjusted to balance the budget.

⁴⁴ *DOF Property Tax Report*. The property tax reserve includes items that affect property tax revenue but that are independent of the levy.

residentially-zoned vacant land, and small condominiums; Class 2 includes all remaining residential property, such as large rental buildings, condominiums and co-ops; Class 3 includes property owned by utilities; and Class 4 consists of all other property, including property with commercial uses. The share of the property tax levy that is billed to each class of property is relatively stable from year to year, but has been adjusting slowly over time to better reflect the market value of the properties in each class.⁴⁵ Once the levy for each class is determined, four different tax rates, one for each class, are fixed by the New York City Council. These rates are calculated by dividing the levy on each class by the billable assessed value for that class.⁴⁶

Between June and January of each year all properties (more than 1 million) in the city are valued and assessed.⁴⁷ A tentative assessment roll that includes each property's tax class, assessed value, and portion of any such value that is eligible for exemption, is published online by DOF no later than January 18.⁴⁸ At the same time that the tentative roll is published online, each property owner is sent a "Notice of Property Value," which details how the taxable assessed value of the owner's property was determined. The notice includes DOF's determination of the tax class to which the property belongs, its estimate of the market value of the property, any exempt portion of the property's value, and a description of how the market value was determined.

The tax on a property is calculated in several steps. First, DOF estimates the market value of the property, generally either by reference to the sales of comparable properties within the prior year or by capitalizing the income and expenses associated with renting the property.⁴⁹ Second, this estimate is multiplied by the "assessment ratio," which is six percent for Class 1 properties and 45 percent for all other properties. This product would be the assessed value of the property were it not for special "cap" rules that limit the amount by which a property's assessed value can change from one year to the next. In the case of Class 1 properties, the assessed value of a property cannot increase by more than six percent in any one year or 20 percent over five years. After application of the cap rules, the total amount of any exemptions is subtracted from the assessed

⁴⁵ Each class's share of the levy is based on the share of the levy that such class represented in 1989 (the "base proportions"). The base proportions are adjusted by New York's Office of Real Property Tax Services to generate the "current base proportions." These are then further adjusted "to reflect physical and other non-equalization (non-market) changes that are reflected on the current assessment roll." *DOF Property Tax Report*.

⁴⁶ <http://council.nyc.gov/html/about/budget.shtml>.

⁴⁷ Residential and commercial properties are valued by DOF. Utility property is valued by the state's Office of Real Property Tax Services.

⁴⁸ CITY OF NEW YORK TAX COMMISSION, INSTRUCTIONS FOR HOW TO APPEAL A TENTATIVE ASSESSMENT (2011), <http://www.nyc.gov/html/taxcomm/downloads/pdf/tc600.pdf>.

⁴⁹ For certain specialty properties the city uses a cost-based valuation method. http://www.nyc.gov/html/dof/html/property/property_val_assessment.shtml.

value to determine the taxable assessed value. This amount is multiplied by the tax rate for the class to which the property belongs to determine the property tax liability. This liability may be reduced by abatements in certain cases, although these are not material for Class 1 properties

2. Property Tax Billing and Mortgage Escrow

DOF prepares Statements of Account (“SOAs”) for each property, generally on a quarterly basis. Each SOA is both a property tax bill and an account summary. All properties with an assessed value of \$250,000 or less pay property taxes quarterly, while properties with an assessed value greater than this amount pay semi-annually. SOAs are mailed a month before payments are due, on July 1, October 1, January 1, and April 1 for quarterly payers and July 1 and January 1 for semi-annual payers.⁵⁰ Property owners do not receive an SOA if they pay taxes through a bank or mortgage servicing company or if they do not have an outstanding tax balance, unless they are responsible for other charges, such as sidewalk fees or emergency repairs.⁵¹ Property owners paying their taxes out of mortgage escrow do not receive SOAs in the mail, although the statements are viewable on DOF’s website.⁵²

Escrow accounts are generally created by lenders upon the origination of a mortgage and are used for the payment of property taxes, homeowners insurance and mortgage insurance. Property owners make contributions to these escrow accounts as part of their monthly mortgage payments to the mortgage servicer, and the amounts are disbursed by the servicer as tax and insurance bills are received.⁵³ Escrow accounts have historically been required for the first year after origination for mortgages insured by the Federal Housing Administration and Department of Veterans Affairs but recent regulations have extended these requirements to most “higher priced” mortgages.⁵⁴ When not required, it is common for lenders to require escrow for mortgage originations with a greater than 80 percent loan-to-value ratio, although there is some variation across lenders in their escrow practices.⁵⁵ Business practices vary because of differences in the scale and focus of lenders’ businesses, such as the kinds of loans they make or whether they tend to operate in jurisdictions where the local assessors have the administrative capabilities to make escrow cost-effective. Under the Real Estate Settlement Procedures Act, lenders are permitted to require that mortgagors

⁵⁰ http://www.nyc.gov/html/dof/html/property/property_bill_duedates.shtml.

⁵¹ *Id.*

⁵² http://www.nyc.gov/html/dof/html/property/property_bill_soa.shtml (“Note: Owners will not receive a Statement in the mail if they pay taxes through a bank or mortgage servicing company or pay by themselves and have no balance.”)

⁵³ <http://blog.citimortgage.com/2011/01/what-is-an-escrow-account.html>.

⁵⁴ See *supra* notes 35-37 and accompanying text.

⁵⁵ Cabral & Hoxby, *supra* note 23.

contribute in excess of their annual insurance and estimated tax liabilities to provide a “cushion” of up to two months of escrow payments.⁵⁶ In rare cases, property owners may choose to establish their own tax escrow accounts.

Escrow arrangements generally terminate upon the satisfaction of the mortgage for which they were created. In some circumstances property owners may be able to opt out of mortgage escrow, either prior to the mortgage closing or sometime afterwards, although such opt-outs typically come at a price: the fee to forego escrow is generally around 0.25 percent of the loan balance.⁵⁷ Lenders tend to prefer escrow arrangements because of the control it gives them over the payment of property tax and insurance bills and the risk of a tax lien arising through delinquency. Lender practices about when homeowners may be permitted to opt out vary, with some requiring that the loan-to-value ratio fall below 80 percent and others being less stringent. In the case of government-insured loans, property owners are not required to maintain escrow throughout the life of the loan, so some lenders only maintain an escrow account for the first year. Escrow accounts in New York are terminated in accordance with New York State law.⁵⁸

3. Assessments Appeals

Property tax appeals have increased over time, accelerated by the recent housing market collapse.⁵⁹ In New York City, the tax appeals process in 2011 generated \$6.1 billion in assessment reductions and \$542,799,712 in tax reductions for those properties.⁶⁰ Because the city anticipates the effects of the tax appeals process when setting the property tax rates for the coming fiscal year, the

⁵⁶ Real Estate Settlement Procedures Act, 12 U.S.C. §§ 2601–2617 (2011).

⁵⁷ Vickie Elmer, *Shrinking the Escrow*, N.Y. TIMES, January 26, 2012 at RE2.

⁵⁸ Title 3-A of the New York Property Tax Law deals with tax escrow accounts. The bank maintaining the escrow account must provide a report on the account at least annually to the account holder. N.Y. REAL PROP. TAX LAW § 953. Within 21 days after final payment of the mortgage loan, if the mortgagor retains ownership of the property, the bank must send to the borrower a written statement stating that the escrow account has been/will be terminated and that the borrower will be obliged to pay taxes becoming due thereafter unless a new escrow account is established. N.Y. REAL PROP. TAX LAW § 953.

⁵⁹ The Commissioner of New York City’s Tax Commission has noted “a growing trend of people filing especially with the down turn in the market.” Bob Hennelly, *Tight Financial Times Have More City Homeowners Appealing Tax Bills*, WNYC NEWS, Mar. 15, 2012, available at <http://www.wnyc.org/articles/wnyc-news/2012/mar/15/tight-financial-times-have-more-city-home-owners-appealing-tax-bills/>. Class 1 appeals in New York City are relatively rare, because the system of caps, discussed infra p.24 keeps assessed values well below what they would be based on market values. Appeals are more common in other parts of the country. See Alina Tugend, *Seeking lower property taxes on a house of sinking value*, N.Y. TIMES, May 7, 2010 at B5 (in most places about 5 percent of homeowners go through the grievance process.)

⁶⁰ City of New York Tax Commission, Annual Report (2011) at 13, http://www.nyc.gov/html/taxcomm/downloads/pdf/annual_report.pdf [hereinafter *Tax Commission Annual Report*]. This represents 3.2% of the city’s property tax revenues in FY 2011.

effect of assessment reductions is to increase rates, thereby shifting tax liability from those who successfully appealed their assessments to those who did not.

Property owners can file applications for review of assessments for one-, two- and three-family homes and other Class 1 properties with the Commission between January 15 and March 15.⁶¹ The Commission is an independent body that views its role as helping “the City maintain the integrity of the property tax assessment rolls, the sound and equitable allocation of the property tax burden and promot[ing] public confidence in government and the tax system.”⁶² Its review process helps reduce the number of disputes that are litigated in court, which can be costly for both the city and taxpayers. By revising assessments before the final roll is published, the city can also be spared the expense of issuing and refunding tax overpayments.

A typical application requests review of a property’s assessed value, but can request review of any aspect of the assessment, including classification and exemptions.⁶³ The Commission cannot increase an assessment, but its policy is to advise DOF “of clear instances of apparent underassessment for appropriate consideration in the next year.” Applicants must support their request for review with facts and arguments and the burden of proof is on the taxpayer, who must show by a preponderance of the evidence that an adjustment is appropriate.⁶⁴ The Commission may review assessments for both the current and immediately prior fiscal years. Taxpayers may also request that DOF review the description of the property and its fair market value,⁶⁵ although DOF’s website states that “[i]f you want to be certain that information is corrected and applied to your property tax bill, you should also file an appeal with the Tax Commission.”

There are three grounds on which a taxpayer may appeal her assessment: (1) misclassification (the property has been assessed in the wrong tax class); (2) excessiveness (the assessment does not reflect all of an exemption to which the property is entitled or a cap has been exceeded); (3) inequality (the property has been assessed at more than six percent of its market value); and (4) unlawfulness (the property is fully exempt).⁶⁶ The typical application seeks a reduction in the property’s assessed value based on a claim of inequality, which is essentially a

⁶¹ Other persons “aggrieved” by the assessment, such as a lessee of the entire parcel that is responsible for paying the taxes, also have legal standing to contest. Appeal Instructions (2011a). The deadline to appeal is March 1 for all other properties.

⁶² *Tax Commission Annual Report*.

⁶³ Tax Commission, *supra* note 48.

⁶⁴ *Id.*

⁶⁵ 19 Rules of the City of New York, Chapter 37. Title 19. These rules stipulate the procedures property owners must follow when requesting DOF review of tentative property value assessments.

⁶⁶ *Tax Commission Annual Report*.

dispute about the property's market value.⁶⁷ A taxpayer in Class 1 will succeed on appeal if she can prove that her property has an assessed value of more than six percent of its actual market value. As part of their application for review, taxpayers can also request an in-person hearing.

The Commission may offer an assessment reduction, a change of class, or exemption. Although more than 98 percent of all applicants are represented by a lawyer or other professional, about half of the applicants from Class 1 represent themselves.⁶⁸ DOF typically relies on its favorable presumption during Commission reviews.⁶⁹ After the Commission has made an offer to adjust a taxpayer's assessment, the adjustment is only made if it is accepted by the taxpayer. Such acceptance must be accompanied by a signed copy of the Commission's standard written agreement, which requires withdrawing other judicial and administrative proceedings related to assessments for prior years in which the taxpayer has an interest.⁷⁰ If the Commission's offer has been accepted by approximately May 21, the adjustment will appear on the final assessment roll published by DOF around May 25. In this case, property tax bills for that fiscal year will reflect the adjusted assessed value.⁷¹

If the Commission's offer has not been accepted before the roll has been finalized, or if the offer is in respect of a prior year, the adjustment is implemented by remission; DOF will recalculate the property tax liability for the property and issue a refund or credit to the taxpayer.⁷² Taxpayers who do not accept an offer made by the Commission may seek judicial review of their assessment by filing a petition in New York State Supreme Court by October 24 and serving the petition on the Commission.⁷³ Such cases very rarely proceed to trial.⁷⁴

B. A Simple Model of Legal Salience

In the next section, I report empirical evidence that the use of mortgage escrow reduces the likelihood that a property owner will appeal her assessment

⁶⁷ *Id.* (“challenges to the assessed value for properties not subject to limitations on assessment increases (Tax Class 1 and Tax Classes 2A and 2B) are, for the almost all properties, a dispute over the fair market value as determined by the Department of Finance.”)

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Tax Commission Annual Report.*

⁷³ *Id.*

⁷⁴ *Tax Commission Annual Report* at 13 (“in 2011, there was 1 Article 7 petition taken to trial and decided by the Courts.”) This section discusses only the present, and very recent, state of the tax appeals process in New York. For a description of the roots and history of appeals, see Mark A. Willis, *Tax Certiorari Proceedings and the Present Real Property Tax System in New York City*, 9 *FORDHAM URBAN L.J.* 591 (1980).

and that both the expected savings from a successful appeal and probability of winning the appeal increase that likelihood. These variables were not chosen at random from among the many that are included in my data; rather, they emerge naturally from a very simple theoretical economic framework. In this section I provide an outline of that framework, which both aids the interpretation of the results and provides justification for the variables that I use in my empirical analysis. Although the formalization of the framework is important because it helps make the assumptions, logic, and predictions of the model precise, the intuition about what motivates property owners in this framework is straightforward: a taxpayer will appeal her assessment if the expected *perceived* tax that would be saved in a given year from appealing is greater than the costs of appealing.⁷⁵ In nearly any consequentialist model of the appeals decision, the taxpayer will be more likely to appeal both as the taxes saved from a successful appeal and the probability of winning that appeal increase, and my model does indeed make these predictions. The key innovation I add to the framework is to allow the perceived benefits from appealing to differ from the actual benefits. The perceived benefit of appealing declines as the salience of the property tax is reduced. In the empirical analysis that follows, it is the use of mortgage escrow that reduces salience. A formal description of the framework follows. Readers disinterested in the formalisms may choose to skim them and move to the final two paragraphs of this section for a discussion of some of the interesting dynamic aspects of the appeals decision.

In each year t , a property owner incurs a set of housing-related costs, including property taxes, property insurance, maintenance and, in the case of a mortgage, mortgage insurance and principal and interest payments. In any year, for any of the individual housing related costs, a taxpayer can take an action (with its own cost) that reduces that housing cost with some probability. For example, the property owner could take the time to investigate refinancing options for their mortgage to obtain a lower interest rate or shop for more inexpensive property or mortgage insurance. I focus on the decision to appeal the property's assessment. At the beginning of each year, a property owner can appeal her assessment by taking the action $a_t \in \{0,1\}$ ($a_t = 1$ if the property owner appeals) that, for cost $c_t > 0$, changes her property's market valuation from MV_t to MV'_t , with probability p_t . If the appeal is successful, her property tax liability will change from T_t to T'_t . The cost of appealing could include the time spent learning about the appeals process, completing the paperwork, conducting any preliminary research, attending an in-person hearing, and hiring a professional appraiser.⁷⁶

⁷⁵ I assume that the decision incorporates only current period costs and benefits for the sake of simplicity.

⁷⁶ The Tax Commission recently imposed a \$175 fee on applications for which the assessed value of the property is at least \$2 million. This is not relevant for any but the smallest handful of luxury homes in the city. Prior to this there had not been any other filing fee. *Tax Commission Annual*

I incorporate salience by allowing that property owners may not accurately perceive the amount of their property taxes. I assume that perceived property taxes are equal to $\theta_t T_t$, where the parameter $\theta_t \geq 0$ represents the salience in year t of tax T in year t ; a higher value for θ_t corresponds to a more salient tax. I assume that the taxpayer's utility is linear in property taxes and the costs of appealing, so that every year the taxpayer solves the following problem (time subscripts are suppressed):⁷⁷

$$\min_a a[p\theta(T' - T) + c] + \theta T$$

A taxpayer will appeal by choosing $a_t = 1$ in a given year if and only if the expected perceived tax savings from appealing exceed the cost of appealing. In New York City, the tax due on a property is equal to the nominal tax rate, τ_t , multiplied by the assessed value of the property, AV_t . The assessed value of a property is the lesser of six percent of its market value, or 106 percent of its assessed value in the previous year:

$$T_t = \tau_t AV_t = \tau_t \min\{0.06 MV_t, 1.06 AV_{t-1}\}$$

Define T'_t and AV'_t analogously as the tax due and assessed value of the property following a successful appeal:

$$T'_t = \tau_t AV'_t = \tau_t \min\{0.06 MV'_t, 1.06 AV_{t-1}\}$$

Substituting these two definitions into the taxpayer's decision problem, the model predicts that the taxpayer will appeal in year t if and only if the utility from appealing is greater than zero:

$$U(\text{appeal}) = p_t \theta_t \tau_t (AV_t - AV'_t) - c_t > 0 \quad (1)$$

or equivalently,

$$p_t \theta_t \tau_t [\min\{0.06 MV_t, 1.06 AV_{t-1}\} - \min\{0.06 MV'_t, 1.06 AV_{t-1}\}] - c_t > 0 \quad (1a)$$

Several predictions follow straightforwardly from the simple model in Equation (1). A taxpayer will never appeal when a successful appeal would lead to an increase in property taxes, and is more likely to appeal as the probability of

Report at 7. Most property tax appeals representatives work on a contingency basis so their fees are not a cost of appealing, although they would reduce the expected return.

⁷⁷ I assume here that the minimization problem for property taxes is separable from the other decisions that the property owner faces.

winning an appeal, the salience of the tax, and the tax savings from winning the appeal increase. The likelihood of an appeal decreases as the cost of appealing increases. Formulation (1a) reveals several additional predictions, best understood by thinking about three cases. First, when 106 percent of last year's assessed value (the "capped value") is less than both six percent of the current year market value as determined by the assessor and six percent of the lowest market value that the property owner could successfully argue for on appeal, such as can frequently occur during periods of rapid price appreciation, the taxpayer will not appeal, regardless of whether or not the assessor has overvalued the property. That is simply to say that if the taxpayer's tax liability would not be reduced even if she convinced the Tax Commission that her property had been overvalued, there is no benefit to appealing. In fact, the annual Notice of Property Value counsels owners in precisely this manner.⁷⁸ Second, when the capped value is greater than six percent of the assessor's determination of market value, the benefit of a successful appeal is equal to the full tax-effected value of the reduction in market value, or $\tau_t \cdot 0.06 (MV_t - MV'_t)$. Finally, if the capped value is greater than $0.06 MV'_t$ but less than $0.06 MV_t$, then the potential benefit of a reduction in market value is $\tau_t(1.06 AV_{t-1} - 0.06 MV'_t)$. Consequently, the amount of home price appreciation from year to year can affect the benefits and, hence, probability of appeal, with the probability being greatest during periods of low appreciation and lowest during periods of high appreciation.

Although the model captures important features of the appeals decision, there are some interesting dynamic elements to the decision omitted from my framework. Because New York City's property tax law limits the rate at which a property's assessment can increase from one year to the next, a successful assessment appeal can reduce future, as well as current year, taxes. By lowering the assessed value in the current year, it also lowers the capped value in the next year, potentially resulting in a lower tax bill in that year as well. This effect will be especially pronounced during periods of rapid price appreciation. When prices are more stable, winning an appeal will tend to have an effect only on current year taxes. Thus, the expected benefits of filing an appeal depend on expectations about future price appreciation.⁷⁹

⁷⁸ In fact, property owners are advised that their assessment will not be reduced unless they can demonstrate that the value of their property is less than the "effective market value" reported on the Notice. The effective market value of the property is just that amount that, when multiplied by six percent, is equal to the assessed value. Thus, for a property with an assessment that is subject to the cap, the effective market value in period t is equal to $\left(\frac{1.06}{0.06}\right) AV_{t-1}$. My description of the language in the text is mathematically equivalent.

⁷⁹ This effect appears to be well known, at least among some tax appeals practitioners. See Toluse Olorunnipa, *Fewer South Floridians Appeal Property Tax Bills*, MIAMI HERALD, September 19, 2010 at 1 ("[M]any tax appeal firms say now is an opportune time for homesteaded owners to challenge their county-assessed values, because locking in a low assessment this year will pay dividends in the future, when housing values eventually go up. Florida's Save Our Homes law

The model I use also assumes that prior appeals have no effect on subsequent decisions, except through the effect that a successful appeal would have on the assessed value in those years. Several of the variables in Equation (1) could be affected in unmeasured ways by previous experience with the appeals process. For example, a taxpayer may become more effective at making her case before the Commission as she accumulates experience. Once familiar with the appeals process, a taxpayer may find it easier to navigate in subsequent years, lowering the cost of appealing. Appealing is also likely to make the taxpayer more aware of her property tax liability in subsequent years, possibly increasing its salience. On the other hand, experience with the appeals process could simply reveal it to be more costly than anticipated, making the taxpayer less likely to appeal the following year. An additional factor is the use of tax appeals professionals, who could influence the intertemporal dynamics of the appeals decision by targeting homeowners who either have or have not recently appealed. Incorporating these factors would complicate the model considerably and I omit them to focus the salience issue, but an analysis of their effects is a worthy topic for future scholarship.

C. Empirical Approach and Dataset Construction

1. Empirical Approach

The ideal way to identify the causal effect of mortgage escrow (and tax salience) on appeals would be to randomly assign mortgage escrow to half of the properties in the city and observe the difference in appeals between properties with and without escrow. This would ensure that escrow use was independent of both observable and unobservable characteristics of the property and the property owner that could influence whether the owner is likely to appeal her assessment. Such characteristics are likely to confound attempts to identify the effect of escrow on appeals. To point out the obvious, escrow is generally only used if the property owner has a mortgage. As noted above, escrow tends to be required for government-insured mortgages and mortgages with an origination loan-to-value ratio of at least 80 percent. The owners taking out these mortgages and the properties subject to these mortgages are likely to differ in relevant ways from the rest of the population. Properties purchased with a small down payment or a government-insured mortgage may be located in specific areas, and if homes in these areas are more likely to be over-assessed because it is harder to find comparable sales on which to base the assessment, this can give rise to a spurious

limits the increase in assessed values to 3 percent annually for homesteaded owners. Sharpe, who is filing appeals for all of his personal properties, encourages his clients to challenge their assessments this year to take advantage of the Save Our Homes law. ‘Think about the additional advantage of the cap of 3 percent,’ he said. ‘It’s like resetting the base.’”)

relationship between escrow and appeals. The difficulty of finding comparable sales can arise because the properties themselves have unusual characteristics, or because there is less turnover in the housing market and therefore less information on which DOF can base its estimate of a property's value. Home purchasers who receive these sorts of mortgages are not a random sample of the population and may be more or less likely to appeal their assessments because of differences in education, familiarity with the appeals process, or access to professional counsel on such matters. Individuals who opt out of escrow may also, on average, be more careful in attending to their personal finances, which may also affect how closely they examine their property tax liability and the likelihood that they will appeal.

Because of the unavailability of random assignment or some quasi-experimental method, I attempt to identify the effect of mortgage escrow on property tax appeals using a unique, property-level panel dataset that allows me to control for all time-invariant characteristics of the property and the property owner that could influence both whether the owner utilizes mortgage escrow and whether she is likely to appeal her assessment. For each individual property I examine the relationship between changes in escrow utilization and changes in appeals. This "fixed effects" approach constrains my analysis to those properties that both appealed in at least one year and did not appeal in at least one year, and estimates the effect of salience by looking at the pattern of appeals decisions within individual properties rather than by comparing across different properties. The key assumption I make in this approach in order to conclude that escrow use causes a change in the probability of appeal is that there is no *time-varying* variable that affects both the decision to use escrow and the decision to appeal.

2. Data Collection

The dataset I use to analyze property tax appeals decisions was compiled from five separate sources. First, data on individual property characteristics and appeals were taken from New York City's Real Property Assessment Database ("RPAD"). All one- to three-unit residences and residentially-zoned vacant lots were extracted for fiscal years 2010-2012.⁸⁰ The RPAD data were then merged with datasets matching the properties with various geographic units to which they belong, such as census tracts and sub-borough areas, which are units defined by the U.S. Census Bureau and correspond roughly to neighborhoods such as the Upper West Side of Manhattan or Bedford Stuyvesant, Brooklyn. Second, data from the Commission were obtained for all appeals filed during the sample period. These data include any reduction in assessed value offered by the Commission and accepted by the property owner. If an offered assessment reduction was accepted, I coded the appeal as a "win" for the property owner, and

⁸⁰ As noted *supra* p.19, New York City's fiscal year runs from July 1 to June 30. The fiscal year is named by the calendar year in which it ends.

if the Commission did not make a reduction offer or that offer was not accepted then it is coded as a “loss.” Third, each property/year record was matched to Zillow’s housing price index for the zip code in which the property is located. Fourth, New York City’s Automated City Registration System, which tracks property record filings, was used to identify properties that transferred ownership during the sample period; these properties were excluded from the sample.⁸¹

Finally, I obtained information on escrow use for fiscal years 2010-2012 from individual Statements of Account. DOF makes SOAs for every tax lot in the city available on its website. Among other things, these bills indicate whether the property owner pays her property taxes directly or whether they are paid out of mortgage escrow. I downloaded the final bill of each calendar year for each property in my sample, approximately two million individual property tax bills, and parsed these bills to extract information on escrow use.

Because I am interested in understanding the decision making process of individual property owners, I restrict the sample to only those properties (i) that appear in the RPAD sample for all three years of the sample period, and (ii) for which no transfer was recorded in the city’s registration system between January 2008 and March 2011. This helps to ensure that all appeals decisions made in respect of an individual property were made by the same property owner. The resulting dataset is a balanced panel following 609,088 properties over three years, resulting in 1,827,264 lot/year observations. It provides a rich picture of the properties for which appeals were filed, the potential benefits of appealing, and the information necessary to estimate the model described above. Using this dataset, I construct the variables in Equation (1).

The Probability of Winning on Appeal (p)

I use two measures to proxy for the taxpayers’ subjective assessments of the probabilities that they will win on appeal: (1) the appeal win-rate in the property’s sub-borough area for the prior year, and (2) the appeal win-rate in the property’s zip code for the prior year. Although there is no way for a taxpayer to identify the win-rate in their neighborhood with precision, this variable may be a good measure of the estimates that taxpayers form through casual information collection (*e.g.*, conversations with their neighbors, news articles). The win-rate at a particular level of geography is equal to the number properties for which an appeal was filed and assessment reduction offer was accepted, divided by the number of properties for which an appeal was filed.⁸²

⁸¹ The sale of a property could be correlated with both changes in escrow use and the probability of appealing, which would cause my estimate of the effect of mortgage escrow on appeals to be biased. 51,560 properties were dropped from the sample because of this restriction.

⁸² Both the numerator and denominator include only properties that are in my dataset.

Property Tax Salience (θ)

I use tax escrow as a proxy for property tax salience. The tax escrow variable is a “dummy” variable that takes on a value of 1 if the property owner pays her taxes out of escrow and 0 if not.

Nominal Tax Rate (τ)

At the time that they are deciding to file an appeal for the upcoming fiscal year, the property owner does not know what the nominal rate for that year will be. I use the nominal rate that is actually chosen for that year.

Property Owner’s Own Determination of Market Value (MV')

I cannot directly observe a property owner’s belief about the market values of her property, so I use two alternative proxy measures of what that property owner thinks her property is worth. The first measure assumes that people estimate the current-year market value by beginning with DOF’s determination of the property’s value in the prior year and then adjusting it for changes in the overall level of housing prices in their zip code. I use Zillow’s housing price indices to measure changes in the level of housing prices. Under this measure, $MV'_t = MV_{t-1}(1 + \% \text{ change in index})$. The second measure assumes that people estimate the value of their homes by comparing it with the values of homes in their immediate vicinity. Specifically, I use the average DOF estimate of the value of a square foot of Class 1 property on the block on which a property is located, multiplied by the size of that property, as the property owner’s estimate of her own property’s market value.

Other Variables (MV , AV_{t-1} , c)

DOF’s determination of the property’s current year market value and the assessed value from the prior year are both observable in RPAD. The property owner’s cost of appealing is unobserved, and I assume that it includes a component that is constant over time and a random (unobserved) component that is uncorrelated with the observable determinants of appeals.

D. Results: Salience and Other Causes of Property Tax Appeals

1. Descriptive Statistics: Properties and Property Owners

Because New York City’s fiscal year definition can be a bit confusing, I report my results using the following conventions. References to 2010 refer to the

fiscal year from July 2010 to June 2011. “Current” values refer to the values for that fiscal year. “Tentative” values refer to the values posted on DOF’s website in January of 2011, applicable to the fiscal year from July 2011 to June 2012. Properties identified as having escrow in 2010 are those for which taxes were paid out of escrow as of the last bill in calendar year 2010. Properties with an appeal in 2010 are those that filed an appeal after receiving their tentative assessment in January of 2011. Years 2008 and 2009 follow the same conventions.

Table 1 reports summary statistics for various property valuation variables for the properties in my dataset, as well as the probabilities of filing an appeal and winning an appeal that has been filed, by escrow status and year. Tax escrow is very common; in each year 52 percent of the properties in my sample used escrow. In each year, properties that use escrow are also less than half as likely to appeal as properties that do not. In 2010, for example, 0.37 percent of properties without escrow appealed their assessments, while 0.16 percent of properties with escrow appealed. Interestingly, the appeals win-rate for properties that use escrow is *higher* than the win-rate for properties without escrow, suggesting that the appeals from escrow properties are more meritorious on average than appeals from non-escrow properties.⁸³ Rows 3-5 show that escrow properties have lower DOF-estimated market values, assessed values, and annual tax liabilities, on average, than non-escrow properties.

Rows 6-8 show the average change in DOF’s current year determination of market value, assessed value, and property tax liability from their current values to their tentative values for the following fiscal year. For example, the average market value for non-escrow properties in 2008 was \$649,210. When the tentative assessments for those properties were released in January of 2009, the average market value had fallen by \$27,656. From 2008-2010, properties with escrow experienced a steeper decline in market value and a smaller rebound. A comparison across rows of changes in market values, assessments and tax liabilities also reveals one of the peculiarities of New York City’s tax system arising from the effect of the annual assessment caps: assessed values (and tax liabilities) can increase at the same time that market values are falling.⁸⁴ From 2009 to 2010, for example, average market values for non-escrow and escrow properties fell by approximately \$18,500; yet, average tax liabilities increased by \$156 and \$184, respectively.

⁸³ Using simple equality of proportions tests, the difference is statistically significant at the 5 percent level for 2010, but not for 2008 and 2009.

⁸⁴ This can occur when the capped value is far below six percent of the market value. Consider an example. In 2010, Property A has a market value of \$500,000 and an assessed value of \$15,000 (because it is a capped value). Suppose that in 2011 the property’s market value falls to \$350,000. The property’s assessed value in 2011 will be the lesser of $1.06 \times \$15,000$ and $0.06 \times \$350,000$. The first term, \$15,900 is smaller, so the assessed value in 2011 is \$15,900. The assessed value (and tax liability) of the property has increased as the market value has fallen.

Rows 9-12 contain estimates of the overvaluation of properties in my sample, using both measures of the owner's estimate of her property's market value. Using the Zillow-based measure of market value, escrow properties were more overvalued in 2008 than non-escrow properties, but less overvalued or more undervalued than escrow properties in 2009 and 2010. Compared with other sample properties on their blocks, escrow properties were overvalued and non-escrow properties were undervalued, across all years. The final two rows show the mean tax savings that property owners in each column would have obtained from successfully persuading the Commission that their assessed value should be based on their estimate of their property's market value, using the two measures of market value. This is a counterfactual exercise for any property in which the assessment would be increased by adopting the property owner's estimate of market value, because the Commission cannot increase assessments. The negative numbers in these rows indicate that the average assessment would have increased if they were based on the property owner's estimate of market value (and the Commission was not otherwise barred from increasing assessments). Under either the measure of home values, the average benefit of appealing in terms of tax savings is greater for the escrow than the non-escrow properties.

Table 1 illustrates that there are differences between properties that have escrow and those that do not. Compared with non-escrow properties, properties that use escrow tend to (1) be worth less, (2) be overvalued, relative to other properties on their block, (3) have a higher probability of winning on appeal, (4) have greater potential benefits from appealing, and (5) have had bigger decreases in market value accompanied by bigger increases in tax liability during the sample period. These facts both highlight the importance of controlling for property-specific characteristics in an analysis of the effect of escrow on appeals and make the higher appeals rate for non-escrow properties even more puzzling: facts (2)-(5) all would be expected to make escrow properties *more* likely to appeal.⁸⁵

Tables 2 and 3 report summary statistics on property owners from New York City's 2008 and 2011 Housing and Vacancy Surveys. The survey is conducted every three years to comply with New York State and New York City rent regulation laws and reports various housing unit and household characteristics. In Table 2 I report summary statistics for owner occupied units in one- to three-unit buildings, excluding condos and co-ops.⁸⁶ Table 3 further restricts this sample to only households with mortgages.

⁸⁵ The correlation between certain property characteristics and the use of escrow illustrates the fact that escrow use is not randomly distributed across properties as it would be in the sort of randomized, controlled experiment described in Subsection II.C.1, and motivates the fixed effects approach that I use here.

⁸⁶ I also restrict the sample to units in which the householder reports paying their property taxes directly or out of mortgage escrow.

Table 2 shows that, relative to properties without escrow, households that pay their property taxes out of escrow are more likely to have a male head of household and be Black, Hispanic or Asian, and are less likely to be U.S.-born. They are larger than households without escrow and more than twice as likely to have children under the age of 18 living in the home. Households with escrow have slightly higher annual incomes, on a per capita basis, than those without escrow, a difference that is attributable to differences in wage income. Households without escrow derive more of their income from social security, retirement and disability while households with escrow have much higher wage incomes. There is also a striking difference in how long the two categories of homeowners have lived in their homes; the average year in which households paying taxes out of escrow moved into their units is 1995 while households that do not pay out of escrow moved into their homes more than 15 years earlier, on average. This difference suggests the most important obvious difference between households with escrow and those without: 99 percent of homeowners with escrow have a mortgage, while only 32 percent of those without escrow have a mortgage.

Table 3 reports the same summary statistics for only homeowners with mortgages. A comparison with Table 2 suggests that much of the difference between homeowners with and without escrow is attributable to the differences between households with and without mortgages. Restricted to mortgagors, households with escrow are still more likely to be racial minorities, are less-likely to be U.S.-born, have lived in their home for less time, and tend to have less valuable homes than non-escrow homeowners, but the differences are much smaller than in Table 2. Escrow and non-escrow homeowners also look much more similar in terms of their income, although non-escrow homeowners still earn a greater share of their income from passive sources.

Tables 2 and 3 illustrate that, in addition to differences in property characteristics between properties that do and do not use escrow, there are also differences in the characteristics of the owners of those properties, the most important being the difference between households that have a mortgage and those that don't. Some of these differences might well be expected to affect whether a property owner appeals her assessment. For example, homeowners who have lived in their homes longer may be more likely to be aware of the appeals process; native-born homeowners may be more likely to be fluent in English and more likely to be confident about using an appeals process that would be difficult to navigate in a foreign language.⁸⁷ Homeowners with escrow also have larger households, are more likely to have children, and are more likely to be in the work force, possibly leaving them with less time to appeal their assessments. The descriptive statistics highlight the importance of property and household

⁸⁷ All of the forms on the Tax Commission's website appear only in English.

characteristics that could bias estimates of the effect of escrow on tax appeals if proper controls are omitted from the empirical model. As discussed in Subsection II.C.1, my approach permits me to control for all characteristics of the property and property owner that are fixed over the sample period and could affect the probability of appeal.

2. Regression Estimates

As is typical in the literature, I model the utility of appealing as a linear function of the variables and parameters. The decision to appeal depends on the probability of winning the appeal, the salience of the property tax, the value of a successful appeal and the cost of appealing. I estimate the following econometric model:

$$y_{ist} = \beta p_{st-1} + \theta E_{it} + \gamma \tau_t (AV_{it} - AV'_{it}) + \rho Y_t + \alpha_i + \epsilon_{it} \quad (2)$$

where y_{ist} is an indicator for whether property owner i in neighborhood s appealed in year t . p_{st-1} is the tax appeals win-rate in neighborhood s in year $t - 1$, which I assume the property owner uses as her estimate of the win rate in year t . E_{it} is the tax escrow dummy variable, *i.e.*, a variable with a value of 1 if escrow is being used and 0 if it is not. τ_t is the nominal tax rate in year t . AV_{it} and AV'_{it} are the assessed values of the property based on the city's determination of market value and the determination that they would have made using the taxpayer's estimate of market value.⁸⁸ The neighborhood s refers to either the property's zip code or its sub-borough area, depending on the regression specification. Y_t is a dummy variable with a value of 1 if the observation is in year t and a value of 0 otherwise. This variable captures the average effect of any year-specific shock over the entire sample. The coefficients in the model, β , θ , γ , and ρ , are estimated in the regression procedure. I model the unobserved portion of utility, including the cost of appealing, as having both constant individual-specific (α_i) and idiosyncratic (ϵ_{it}) components and assume that the idiosyncratic component has a logistic distribution. Because the individual/property specific effect is likely correlated with the use of escrow and the other variables on the right-hand side of the regression equation, I condition on that individual fixed effect rather than assuming that it is random, estimating a conditional fixed effects logit model.

Table 4 reports regression coefficient estimates for the model on the entire sample of properties. Specification (1) assumes that property owners form their

⁸⁸ The model has the same general form as other econometric models of the effect of "fiscal illusion." *See, e.g.,* Wallace E. Oates, *On the Nature and Measurement of Fiscal Illusion: A Survey*, in *TAXATION AND FISCAL FEDERALISM: ESSAYS IN HONOUR OF RUSSELL MATHEWS* 65, 68 (Geoffrey Brennan, Bhajan Singh Grewel & Peter D. Groenwegen eds., 1989)

beliefs about the value of their property using the Zillow price index and specification (2) assumes that they use the mean value of Class 1 property on their block (as determined by DOF) as their estimate. Specifications (3)-(6) differ from specifications (1) and (2) in that they use the win-rate in the property owner's zip code, rather than the win-rate in the property owner's sub-borough area, from the prior year to measure the property owner's expectations about the probability of winning an appeal. Specifications (5) and (6) differ from the first four specifications by replacing the tax savings variables $\tau_t(AV_{it} - AV'_{it})$ with separate variables for the amount of over-assessment, $MV'_{it} - MV_{it}$, and the current year tax liability, $\tau_t AV_{it}$.

The effect of mortgage escrow on the probability of appeal is negative and statistically significant at the 0.1 percent level in all specifications. This statistical result means that it is extremely unlikely that the negative relationship between escrow and tax appeals was observed by sheer chance, and that we can have a great deal of confidence that there is a negative relationship between escrow use and the likelihood of appeal. The probability of appeal also increases with the tax savings from a successful appeal measured using both measures of market value. The effect of the win-rate in the sub-borough area is positive but not significant at conventional levels, but when expectations about the probability of winning are measured using win-rates at the zip-code level, the effects are positive and statistically significant. In specifications (5) and (6) the probability of appeal is increasing in the expected tax liability for the current year, but there is no effect of overvaluation on the probability of appeal, although the coefficient has a positive sign. It is not surprising that overvaluation itself does not have a significant effect on the probability of appeal; as Equation (1a) shows, unless six percent of the property owner's estimate of market value is less than the capped value from the prior year, it will not be rational to appeal no matter how much DOF's estimate overstates the property's true market value.

Table 5 reports coefficient estimates from the same regressions but excludes all properties in Manhattan. Class 1 properties are comparatively rare in Manhattan (making up less than one percent of the entire sample), and because of their sparseness the Zillow housing price index and the block-mean variables may not be good estimates of property owners' valuations of their homes. The effect of escrow on appeals remains statistically significant in all specifications, as does the effect of tax savings, using both measures of market value. The effect of the probability of winning, measured at the zip-code level, is statistically significant in three out of four specifications. As with the whole sample, overvaluation itself has no effect on appeals, but expected tax liability has a positive and significant effect.⁸⁹

⁸⁹ As a robustness check, six linear probability models were estimated with the same covariates as the logit specifications, with the addition of sub-borough area/year fixed effects to capture any

The regression coefficient estimates can be interpreted as the effect of the variables in the regression on the utility from appealing. Because the effect of utility on the probability of appealing is non-linear (as it must be if it is to be always between zero and one), the effect of a variable on the probability of appeal depends on the values of the other variables, which can make it difficult to interpret the size of the coefficients. Perhaps the easiest way to do this is to compare the relative effects of two variables by taking the ratio of their coefficients. The specifications in Tables 4 and 5 contain a range of estimates for the effect of escrow and the effect of the tax savings from a successful appeal, all suggesting that escrow use has a relatively large effect on the probability of appeal. Specification 6 in Table 5 reports the most conservative estimate: paying taxes directly, rather than out of escrow, increases the probability of appeal as much as a \$7,000 increase in the tax savings from a successful appeal.

3. Summary of Results

These results of the regression analysis are consistent with the predictions of the simple economic model outlined in Section II.B. The probability that a property owner will appeal her assessment increases with each of the factors affecting the expected perceived benefits of appealing: the tax savings from a successful appeal, the probability of a successful appeal, and the salience of the property tax. Put another way, the results show that after controlling for all of the fixed characteristics of the property and the property owner that could affect the decision to appeal, the amount by which the property has been over-assessed and the owner's estimate of the likelihood of winning in a given year, and any factor affecting the likelihood of appealing in a given year that is common to all property owners, using mortgage escrow has a large and statistically significant negative effect on the probability that a taxpayer will appeal her property assessment. The descriptive statistics reported in Tables 2 and 3 provide evidence about the households that are most likely to bear higher taxes as a result of the use of mortgage escrow: they are more likely to be racial minorities, working families with children, and non-native.

III. IMPLICATIONS

To point out the obvious, using mortgage escrow is not supposed to increase one's taxes. Nevertheless, because escrow reduces the legal salience of the property tax, which reduces the probability of appeal, taxpayers using escrow are more likely to remain over-assessed and bear a heavier share of the tax burden than they would if property tax law were perfectly enforced. These property

neighborhood-specific shocks that varied across years. Escrow has a negative and statistically significant effect in all six of these models.

owners face an additional burden as the tax saved by those who successfully appeal is effectively transferred to those who do not, through increased property tax rates. The case of property tax appeals illustrates a dynamic that exists in other areas of tax law: the interaction of a taxpayer-initiated tax adjustment process with the idiosyncrasies of the taxpayers' circumstances results in a redistribution of the tax burden that has gone unnoticed by policymakers and is unmoored from any normative criterion. Whether any particular redistribution is desirable depends on the characteristics of the taxpayers who benefit from the enforcement procedures and the characteristics of the taxpayers who do not; the allocation of tax liability after such redistribution could be better or worse than a system in which errors go uncorrected. Consequently, when available, evidence about the causes and effects of differential tax enforcement should be taken into account when identifying the distribution of the tax burden and the tools for altering it.⁹⁰ In this Part, I use the case of the property tax to illustrate the effects that a system of taxpayer-initiated tax adjustment schemes can have on the tax allocation.

A. *Accounting for Tax Enforcement*

A real property tax is designed to tax the value of real property. Under an ideal property tax system, the assessor would accurately determine the values of properties and tax liabilities would be assigned on the basis of those valuations.⁹¹ In reality, assessors make errors, overvaluing some properties and undervaluing others, and taxes liabilities are thereby misallocated. One can imagine several ways of reducing these errors, such as investing in more accurate property valuation methods or increased auditing of assessments. Many jurisdictions rely on a taxpayer-initiated appeals process to correct those errors. One consequence of relying on taxpayers in this way is that arbitrary factors that affect the decision to seek administrative relief can alter the distribution of the tax burden.

Of course, the fact that the appeals process introduces an element of arbitrariness into the assignment of property tax liabilities does not mean that jurisdictions ought to eliminate property tax appeals. After all, successful appeals reduce the over-taxation of those properties that were erroneously over-assessed to begin with, itself a source of arbitrary variation in tax liabilities. Determining

⁹⁰ A related argument has been made by Wojciech Kopczuk, who argues that when certain forms of tax avoidance are more accessible to low-ability taxpayers, lax enforcement against such tax avoidance can have desirable redistributive effects, achieving redistribution without the adverse incentive effects that would be required by changing the marginal rate structure. Wojciech Kopczuk, *Redistribution when avoidance behavior is heterogeneous*, 81 J. PUB. ECON. 51 (2001).

⁹¹ I use "ideal" here in the very limited sense that there are no random errors in the assignment of tax liabilities to properties so that there is perfect enforcement of the substantive tax laws. An "ideal" tax system may not be optimal because, under certain circumstances, random taxes could be welfare improving. See Joseph E. Stiglitz, *Utilitarianism and Horizontal Equity: The Case for Random Taxation*, 18 J. PUB. ECON. 1 (1982).

whether the tax allocation following a somewhat arbitrary appeals process is preferable to an allocation reflecting only assessor error requires a careful examination of the two outcomes and scrutiny of the underlying factors affecting appeals. A simple example will help illustrate. The table below summarizes four different enforcement scenarios. In each scenario, there are four different property owners: A, B, C, and D. Assume that in all four scenarios the four property owners each own a property with a true market value of \$100, and suppose that the government must raise a fixed sum of \$40 in property taxes to fill a budget gap between expenditures and revenue from other sources. Assume also that the property taxes due for a particular property are equal to the tax rate set by the government multiplied by the assessed value of the property, and that the assessed value of a property is equal to 100 percent of the property's market value. Because the amount of tax revenue to be collected is fixed at \$40, the tax rate set by the government will vary inversely with the aggregate assessed value of all four properties.

		Property Owner				Tax Rate
		A	B	C	D	
I. Ideal	Assessment	\$100	\$100	\$100	\$100	10.00%
	Tax	\$10.00	\$10.00	\$10.00	\$10.00	
II. Assessor Error	Assessment	\$100	\$50	\$125	\$125	10.00%
	Tax	\$10.00	\$5.00	\$12.50	\$12.50	
III. Error with Appeals	Assessment	\$100	\$50	\$100	\$100	11.43%
	Tax	\$11.43	\$5.71	\$11.43	\$11.43	
IV. Error with Select Appeals	Assessment	\$100	\$50	\$100	\$125	10.67%
	Tax	\$10.67	\$5.33	\$10.67	\$13.33	

In Scenario I, the “ideal” scenario, the assessor accurately assesses the properties at \$100 each. Because the aggregate property value is \$400, the government will set a tax rate of ten percent and each taxpayer will pay \$10 in taxes. Scenario II illustrates the case in which the assessor makes some errors in her assessments, correctly estimating the value of A’s property but undervaluing the property of B and overvaluing the properties of C and D. Because the assessor’s errors balance out, in the sense that the amount by which the over-assessed properties are overvalued is equal to the amount by which the under-assessed properties are undervalued, the aggregate assessed value of the four properties will be identical to the aggregate value in Scenario I (\$400) and the government will again set a tax rate of ten percent to raise the necessary \$40 in revenue. Relative to the ideal, C and D will each pay \$2.50 too much in property taxes and B will pay \$5.00 too little.

Scenario III illustrates what might be expected to happen to the allocation of tax liabilities arising from assessor error in Scenario II if taxpayers are permitted to appeal their assessments and it is assumed that the appeals system perfectly corrects those errors brought to the attention of the appeals tribunal, and is used by everyone with an incentive to appeal. Because A is accurately assessed, she has no incentive to appeal and her assessment will remain \$100. Similarly, because property owner B is under-assessed, she has no incentive to report the assessor’s error and will not appeal; her assessment will remain \$50. Property owners C and D, on the other hand, will appeal and their assessments will be corrected to reflect their true values: \$100 each. Because the aggregate amount of taxable property value has fallen relative to Scenario II (from \$400 to \$350), the tax rate in Scenario III must be greater than the tax rate in Scenario II to raise the

same amount of revenue. The changing tax rate serves as a mechanism that effectively shifts property tax liability from C and D to A and B, causing A to be overtaxed but bringing B's tax liability more closely in line with her liability in the ideal scenario. Even though they are accurately assessed after their appeals, C and D remain overtaxed on account of the persistent undervaluation of B's property, which causes the tax rate to be higher than it would otherwise be.

Scenario IV illustrates the case of New York City's property tax. Suppose that the appeals process is not used by everyone with an incentive to do so. For example, suppose that C is a longtime homeowner who pays her property taxes directly to the government and is aware of her property tax liability, whereas D has recently taken out a mortgage and pays her property taxes out of mortgage escrow and, as a result, her property taxes are less salient to her and she does not appeal her assessment. In this case, the reduction in C's taxes resulting from a successful appeal is passed to A, B, and D through the increase in the property tax rate, causing B's liability to become closer to her liability under the ideal but causing A to be overtaxed and D to be still more overtaxed.

It is not immediately obvious how we might rank the outcomes in Scenarios II, III and IV in order of preference. Adopting a system of unbiased appeals in the presence of assessor error makes the liabilities of B, C and D closer to their ideal liabilities, but causes A to be overtaxed (Scenario II vs. Scenario III). Adopting a system of selective appeals improves the accuracy of B and C's taxes, but causes A and D to be overtaxed (Scenario III vs. Scenario IV). And, relative to a system of unbiased appeals, a system of selective appeals brings the liabilities of A and C closer to their ideals, but does worse on that score for B and D. I consider two approaches for evaluating these four scenarios. The first way to evaluate these outcomes is as departures from the presumptively optimal ideal system and to view the enforcement issue as fundamentally a problem of minimizing errors. The second way to evaluate these outcomes is by explicit reference to an underlying normative criterion, such as welfare maximization.

1. Error Reduction

The first approach to ranking these outcomes views the enforcement problem as one of error reduction. To be concerned with how well-enforced the property tax law is, *i.e.*, how closely actual liabilities align with liabilities that would be assigned if the law were perfectly enforced, then we require a measure of closeness. There are a couple of natural ways of measuring the "loss" or "penalty" associated with each error of misallocated taxes, both of which assign a positive penalty to an error, regardless of whether that error is an over- or under-assessment. One measure would be to simply sum across all four property owners the absolute difference between the taxpayer's tax liability in that scenario and what their liability would be under the ideal. A system of unbiased appeals fares

best using this measure. Scenario III is worse than the ideal by \$8.58 in tax liability differences; Scenario IV would be worse than Scenario III by a further \$0.76; and Scenario II would be the worst, differing from the ideal by \$10.00 in tax liability differences. An alternative measure is to sum all of the squared differences between actual and ideal tax liabilities across taxpayers. This measure would lead to the same ranking of the four outcomes as the first, but differs in two important ways: it is affected by the distribution of enforcement errors across taxpayers and amplifies large deviations in individual liabilities from the ideal.⁹²

The central shortcoming of approaching the problem as one of error reduction is that there is no natural normative framework to guide the choice between these different measures. Yet, the magnitude and distribution of assessment errors has meaningful consequences for the distribution of income and welfare under the property tax, and so the choice of how to measure the significance of the error is fraught with normative implications. For this reason alone, the error reduction approach seems inadequate. Moreover, the error reduction approach presupposes that the “ideal” outcome is also the appropriate normative target against which the others should be measured. This need not be the case. As I illustrate in the following subsection, a tax regime with enforcement errors that are selectively corrected by taxpayers through the use of administrative procedures could be preferable to the “ideal,” depending on the characteristics of the taxpayers that use the procedures.⁹³

2. *Evaluating the Tax Law as it is Enforced*

The second approach reframes the problem from a separate and distinct one of error reduction in enforcement to a more basic question of how to choose the optimal system of taxation in light of the expected enforcement effects.⁹⁴ Factors that are not specified in the law can drive a wedge between the allocation of liabilities as they are assigned by statute and the allocation that actually arises. Depending on what these factors are, the actual allocation could be more or less desirable than the one that would arise in the case of perfect enforcement. Thus,

⁹² For example, consider Scenario IIA (not represented in the table above) in which the tax liabilities of A, B, C, and D are \$10, \$5, \$10 and \$15, respectively. Measured using the sum of absolute differences, this Scenario is as bad as Scenario II; they are each worse than the ideal to the extent of \$10 in tax liability differences. Measured using the sum of squared differences, however, Scenario IIA is worse than the ideal by \$50 in squared tax liability differences while Scenario II is worse than the ideal by only \$38 squared liability differences.

⁹³ These characteristics will generally be unobservable to the taxing authority cannot simply be directly incorporated into tax law.

⁹⁴ Recent research in economics has made a similar argument in the case of complexity. See Henrik Jacobsen Levin & Wojciech Kopczuk, *Transfer Program Complexity and the Take-Up of Social Benefits*, 3 AM. ECON. J.: ECON. POL'Y. 54 (2011) (treating complexity “as a policy instrument that is chosen alongside benefit levels and eligibility rules in the design of a program.”)

whereas conventional analysis of the property tax would ask whether it is fair, efficient, or otherwise desirable to assign property liabilities on the basis of those properties' market values (and any other observable characteristics specified under the law), this approach asks whether property tax liabilities should be assigned on the basis of market values after taking into account the effects of the mechanisms of enforcement. By shifting focus to an evaluation of these four scenarios as instantiations of property tax law under different enforcement regimes, we can bring to bear the conceptual apparatus that is typically used to evaluate the substantive tax law. For example, we can evaluate the outcomes from within a welfarist tradition that assigns rankings to the outcomes by reference to the well-being of the taxpayers themselves.⁹⁵ To illustrate how such an analysis might proceed, I begin by comparing Scenarios I and II.⁹⁶

Suppose that the assessor error in Scenario II is entirely random, so that it is uncorrelated with any characteristics of the taxpayers. In fact, for simplicity, assume that the four taxpayers are completely identical in all respects (including income). What are the consequences for those taxpayers of the random variation in the property tax? First, the variation increases income inequality among the four taxpayers; B will have a higher after-tax income than A, who in turn will have higher after-tax income than C and D. Having assumed that the four taxpayers are identical, and making the additional assumptions that there is diminishing marginal utility of income to the individuals and that the welfare of the four taxpayers is valued equally by society, the effective transfer of after-tax income from C and D to B will be welfare reducing in the aggregate; social welfare will be higher under Scenario I than II. Viewed *ex ante*, the assessor error effectively imposes a random tax on the property owners. In addition to the \$10 tax imposed on the true value of their property, they face a 50 percent probability of paying a \$2.50 tax and a 25 percent probability of receiving a \$5 rebate (and a

⁹⁵ An alternative approach would be to analyze the problem as one of horizontal equity. In its most platitudinal form, the concept of horizontal equity has considerable intuitive appeal: equals should be treated alike. Of course, abiding by this rule requires specifying the dimensions along which individuals or corporate taxpayers are relevantly "equal." There are important questions about the normative significance of horizontal equity. *See, e.g.,* Louis Kaplow, *Horizontal Equity: New Measures, Unclear Principles*, (Harvard Law School John M. Olin Center for Law, Economics and Business Discussion Paper 279, 2000). *But see* Brian Galle, *Tax Fairness*, 65 WASH. & LEE L. REV. 1323 (2008) (arguing that HE has value as an independent normative criterion because it shows respect for past policy decisions and facilitates revenue raising); Musgrave, *supra* note 13 (arguing that HE should be viewed as an independent norm, not just derivative of VE.); David Elkins, *Horizontal Equity as a Principle of Tax Theory*, 24 YALE L. & POL'Y REV. 43, 46 (2006)

⁹⁶ I ignore any spatial issues arising in the study of optimal taxation in urban environments. For example, if the marginal utility of income is correlated with distance from the city center, it may be optimal to redistribute income in a manner that does not equalize utility, even among households with identical preferences. *See* David E. Wildasin, *Spatial Variation of the Marginal Utility of Income and Unequal Treatment of Equals*, 19 J. URBAN ECON. 125 (1986); J.A. Mirrlees, *The Optimum Town*, 74 SWEDISH J. ECON 114 (1972).

25% chance of paying no tax). The imposition of risk itself on individuals through a random tax tends to be welfare reducing for risk-averse taxpayers.⁹⁷ For these reasons, Scenario I will generally be preferable to Scenario II.

Making the same assumptions as before, Scenario III represents an improvement in social welfare from Scenario II but is worse than Scenario I. To see this, note that in Scenario II the marginal utility of a dollar is greater for C and D than for A and B, because the four taxpayers are identical, have diminishing marginal utility of income, and C and D are taxed more heavily. The outcome in Scenario III can be obtained by transferring tax liability from C and D to A and B, implicitly transferring income in the opposite direction, from taxpayers with relatively low marginal utility to taxpayers with higher marginal utility for income. This is an improvement from a social welfare perspective. The introduction of an unbiased appeals process does not, however, eliminate the partially random nature of the tax distribution. In Scenario III, no taxpayers are over-assessed, but the (random) underassessment of taxpayer B causes the tax rate to be higher than it would otherwise be. The result is as if taxpayer B had been chosen at random and a portion of her property tax liability was shifted to the other taxpayers. On an *ex ante* basis this could be viewed as a random tax in which each taxpayer faced a 75% chance of paying \$1.43 in tax and 25% chance of receiving a rebate of \$4.29.⁹⁸ The random tax component of the tax distribution continues to impose undesirable tax risk on the taxpayers but, under conventional assumptions about the taxpayers' attitudes towards risk, the random tax in Scenario III is preferable to the random tax in Scenario II by the taxpayers.⁹⁹ For these reasons, Scenario III is generally preferable to Scenario II, but less desirable than Scenario I from both an *ex ante* or *ex post* perspective.

Under the same assumptions, the outcome in Scenario IV generates less social welfare than Scenario III so by this criterion we should prefer a system of unbiased appeals to one of selective appeals.¹⁰⁰ On an *ex ante* basis, the taxpayers face a random tax for which they will pay \$0.67 with a 50% probability, \$3.33 with a 25% probability, and receive a \$4.67 rebate with a 25% probability. Under conventional economic assumptions about taxpayers' risk preferences, taxpayers' will generally prefer the random tax they face in Scenario III to this random tax, so the system of unbiased appeals is preferable viewed from this perspective as

⁹⁷ See Kaplow, *supra* note 95, at 17.

⁹⁸ This discussion assumes that both C and D appeal and abstracts from the costs associated with an appeal. More precisely, taxpayers would face (1) a 50% chance of paying the lesser of \$2.50 (if they choose not to appeal) and \$1.43 plus the cost of the appeal, (2) a 25% chance of paying \$1.43, and (3) a 25% chance of receiving the \$4.29 rebate.

⁹⁹ The random taxes in Scenarios II and III have the same mean but the tax in Scenario III has lower variance.

¹⁰⁰ Without additional assumptions about individuals' utility from income we cannot say for certain whether the outcome with selective appeals generates greater social welfare than the outcome in Scenario II.

well. But this analysis ignores a crucially important characteristic of the outcome in Scenario IV: it was generated by a non-random process that caused tax liabilities to be allocated on the basis of individual characteristics that are not generally observable by the tax authority, *i.e.*, the variables that affect the appeals decision. These same factors may constitute information that the tax authority would like to use in determining the allocation of the tax burden, but which it cannot because it is unobservable and so cannot explicitly be taken into account. Whereas tax liability in Scenarios I-III is allocated in a way that is unrelated to the characteristics of the taxpayers, the outcome in Scenario IV reflects these differences. Whether this improves or worsens the *de facto* assignment of tax liability, from a normative perspective, depends on the characteristics driving appeals.

Appeals are affected by the salience of the property tax and the psychic and monetary benefits and costs of appealing.¹⁰¹ We can infer that the perceived net benefits to D of appealing her assessment are less than those for C, perhaps because the opportunity cost of D's time is greater, D is less familiar with the appeals process or is unaware of it, or D's property taxes are less salient to her. If the opportunity cost of D's time is greater than C's because D is more highly compensated, and the taxing authority would like to tax those with greater ability to pay, then the higher tax burden imposed on D would be desirable. On the other hand, if access to professional advice or expertise in navigating administrative procedures are important determinants of the appeals decision, and these characteristics tend to be possessed by households that the government would like to tax more heavily, then the outcome is perverse in assigning a higher liability to D. In any particular context, identifying which variables drive the pattern of enforcement is an empirical question that must be answered on a case-by-case basis.

The example explored in this section illustrates a couple of general points. First, mechanisms of enforcement can affect the ultimate distribution of the tax burden. Second, it is possible for the tax distribution arising from imperfect enforcement to be *preferable* to one arising from perfect enforcement, when the system of imperfect enforcement gives effect to unobserved taxpayer characteristics through the use of taxpayer-initiated administrative procedures. Third, determining whether a particular enforcement regime is superior to one of perfect enforcement is difficult and informationally demanding. In particular, it is necessary to know how the variables that affect the decision to use procedures are related to the taxpayer characteristics that we would like to tax. However, this is not an insurmountable obstacle as demonstrated in Part II, where I identified legal

¹⁰¹ Although mortgage escrow use may be observable to the tax authority in some circumstances, other factors affecting salience and the perceived costs and benefits of appealing generally will not.

salience as an important variable in the property tax appeals context and some of taxpayer characteristics associated with legal salience.

B. Applications to Other Administrative Procedures

One way that legal salience may play an important role in affecting tax liabilities is through influencing the takeup of tax credits and other tax expenditures. In order to obtain these tax benefits, households and businesses have to file tax returns and sometimes satisfy additional documentation and application requirements. The legal salience of these tax benefits is the effect of their visibility or prominence on the use of the procedures for claiming them. Intuitively, it seems likely that tax benefits that are owed from the government to the taxpayer are less salient than taxes that are owed by the taxpayer to the government. In general, opportunity costs (the cost of not claiming a tax benefit in this case) are not regarded as equivalent to out-of-pocket costs,¹⁰² and there is some evidence that the mortgage interest deduction and charitable contribution deduction, specifically, have low salience.¹⁰³ There is also evidence to suggest that the lack of visibility of the Earned Income Tax Credit (EITC) explains, in part, the fact that many potential EITC recipients do not file a federal income tax return and claim the credit.¹⁰⁴ Thus, the legal salience of the EITC could be a target of policymakers desiring to increase takeup of the EITC or other tax expenditure programs, in addition to the other factors that are known to affect EITC takeup, such the complexity of preparing a return and understanding the program,¹⁰⁵ and the stigma associated with receiving government benefits.¹⁰⁶

¹⁰² See Richard Thaler, *Toward a positive theory of consumer choice*, 1 J. ECON. BEHAVIOR & ORG. 39 (1980).

¹⁰³ Listokin & Goldin, *supra* note 8. The authors have also noted that tax expenditures may have low market salience, which implies that their desired effects on, for example, home ownership or charitable giving, may be muted.

¹⁰⁴ See Saurabh Bhargava & Dayanand Manoli, *Why are Benefits Left on the Table? Assessing the Role of Information, Complexity, and Stigma on Take-up with an IRS Field Experiment*, (unpublished manuscript) (arguing that low EITC takeup is primarily due to low program awareness, incomplete information about benefits and eligibility, and informational complexity.)

¹⁰⁵ On the application burden of the EITC to low income households, see Jonathan P. Schneller, Adam S. Chilton & Joshua L. Boehm, *The Earned Income Tax Credit, Low-Income Workers, and the Legal Aid Community*, 3 COLUM. J. TAX L. 177 (2012).

¹⁰⁶ Explaining takeup is an active area of research in economics. See, e.g., Janet Currie, *The Take Up of Social Benefits*, (Nat'l Bureau of Econ. Research, Working Paper No. 10488, 2004); Kory Kroft, *Takeup, social multipliers and optimal social insurance*, 92 J. PUB. ECON. 722 (2008); Dahlia K. Remler, Jason E. Rachlin & Sherry A. Glied, *What Can The Take-up Of Other Programs Teach Us About How To Improve Take-up of Health Insurance Programs* (Nat'l Bureau of Econ. Research Working Paper No. 8185, 2001); Richard K. Caputo, *EITC & TANF Participation among Young Adult Low-income Families*, 4 NW. J.L. & SOC. POL'Y 136 (2009) (concluding that EITC and TANF are underutilized and that takeup is correlated with age,

Similar issues arise in the corporate context with regard to the takeup of tax credits. For example, the Government Accountability Office (“GAO”) estimates that between four and twelve percent of eligible employers claimed the Small Employer Health Tax Credit for 2010. Although some of the explanation for the low takeup is that the credit was an inadequate incentive for many small employers to provide health insurance, the GAO reported that the complexity of the credit, arising from eligibility, data collection, and computational requirements, deterred small employers from claiming it.¹⁰⁷ More than one year after Congress authorized the credit, approximately 50 percent of small businesses were unaware of it.¹⁰⁸ Exploring how the salience of deductions and credits affects the takeup of those tax expenditures and what that might imply about the optimal design of those expenditures is a promising area of research.¹⁰⁹

Legal salience might also be a factor in the decision to use any of the several procedures available to taxpayers to reduce or delay payment of federal income taxes. Shu-Yi Oei has discussed these procedures, and the fact that they have distributional consequences, in two related articles.¹¹⁰ Oei argues that tax collection reallocates tax burdens as the costs of non-collection are passed to other taxpayers (current or future) through increased rates, reduced government expenditures, or greater borrowing.¹¹¹ Once the reality of this necessary fiscal

children, marital status, prior program participation, race and gender, and arguing that that poorest are not taking advantage of EITC because of a lack of computers and access to outreach websites.)

¹⁰⁷ U.S. GOV’T ACCOUNTABILITY OFF., GAO-12-549, SMALL EMPLOYER HEALTH TAX CREDIT FACTORS CONTRIBUTING TO LOW USE AND COMPLEXITY 12 (2012).

¹⁰⁸ *Id.* at 15.

¹⁰⁹ A related concern is the effect of the complexity of the Internal Revenue Code on the cost of claiming tax benefits. This cost can often outweigh the benefits of the expenditure itself, and vary across companies of different sizes. See John D. McKinnon, *Firms Pass Up Tax Breaks, Citing Hassles, Complexity*, WALL ST. J., July 23, 2012 at 15 (reporting that tax compliance cost per employee is approximately twice as high for companies with fewer than 20 employees as for companies with 20-499 employees and that “executives, particularly at small and medium-size companies, complain that many of the tax deductions are either too cumbersome or too confusing.”)

¹¹⁰ See Shu-Yi Oei, *Getting More by Asking Less: Justifying and Reforming Tax Law’s Offer-In-Compromise Procedure*, 160 U. PENN. L. REV. 1071 (2012) [hereinafter *Getting More*]; Shu-Yi Oei, *Who Wins When Uncle Sam Loses? Social Insurance and the Forgiveness of Tax Debts*, 46 U.C. DAVIS L. REV. __ (forthcoming 2012) [hereinafter *Who Wins?*]. Neither article explores in any detail the decision to use these procedures or heterogeneity.

¹¹¹ *Who Wins?*, supra note 110, at 5 (“the costs of non-collection may be imposed upon compliant taxpayers and the public in the form of higher taxes, decreased government provision of goods, services, and social assistance, or macroeconomic impacts resulting from increased government borrowing.”). See also James Alm, *What is an “Optimal” Tax System?*, 49 NAT’L TAX J. 117, 122 (1996) (noting that tax evasion influences tax rates and public expenditures that affect other taxpayers); Joel Slemrod, *Cheating Ourselves: The Economics of Tax Evasion*, 21 J. ECON. PERSP. 25, 41 (2007) (“[t]ax evasion affects the distribution of the tax burden as well as the resource cost of raising taxes” and that even given evasion, “government programs could be financed in a

adjustment is appreciated, the peculiar way that New York's property appeals process redistributes taxes does not look so peculiar after all. The anticipatory increase in tax rates that mitigates the effect of tax appeals on city revenues is simply a more direct and mechanical way of balancing the city's budget than through an unpredictable hodgepodge of current and future tax increases or spending cuts.

One such procedure is the "Offer in Compromise." The IRS is authorized under § 7122 of the Internal Revenue Code to enter into arrangements that forgive some of the taxpayer's tax debt to the government if certain criteria are met.¹¹² The opportunity to seek a compromise with the IRS on the amount of outstanding tax liability can be very valuable to a taxpayer. At the same time, many taxpayers are unaware of the option.¹¹³ Oei notes that "[i]n order for an offer to be processed and approved, it must first be submitted by the taxpayer. Although certain IRS initiatives have explored how to proactively identify those taxpayers most likely to benefit from the procedure, those initiatives have not changed the underlying structural reality—the taxpayer initiates the filing."¹¹⁴ Although Oei discusses some of the considerations that may be relevant to a taxpayer in deciding whether to make an offer in compromise, we know little empirically about what drives that decision. Other procedures that taxpayers can avail themselves of to reduce or delay payment of their tax liability include the right to apply for an installment agreement to govern the payment terms,¹¹⁵ to seek an extension of the time to pay, and to change a prior year's return to obtain a refund.

CONCLUSION

Taxes and regulations can have market salience (affecting market choices), political salience (affecting political decisions), and legal salience (affecting the use of legal processes). For tax regimes that permit taxpayer-initiated administrative procedures to influence tax liabilities, the legal salience of the tax affects the amount and uniformity of enforcement and, consequently, the

number of other ways, such as raising taxes or broadening the income tax base, and a tax reduction could be financed by cuts in overall spending.")

¹¹² See *Getting More*, *supra* note 110.

¹¹³ *Cf. Id.* at 1106 ("In the Act's legislative history, Congress expressed its desire that the IRS do a better job of informing taxpayers that the OIC procedure is available to resolve tax debts"); H.R. REP. NO. 105-599, at 289 (1998) (Conf. Rep.) ("[T]he IRS should make it easier for taxpayers to enter into offer-in-compromise agreements, and should do more to educate the taxpaying public about the availability of such agreements."); U.S. GOV'T ACCOUNTABILITY OFF., GAO-02-311, TAX ADMINISTRATION: IRS SHOULD EVALUATE THE CHANGES TO ITS OFFER IN COMPROMISE PROGRAM 31, 13 (2002) (describing IRS efforts to inform the public of OIC options, including "outreach and education efforts").

¹¹⁴ See *Getting More*, *supra* note 110, at 1120-1121 (2012).

¹¹⁵ I.R.C. § 6159.

de facto allocation of the tax burden. This Article has reported evidence of such effects, demonstrating that property owners using mortgage escrow are less likely to appeal their assessments, and more likely to bear a heavier tax burden than they would if they paid their property taxes directly to the city. In New York City, these property owners tend to be certain mortgagors, who are more likely to be racial minorities, foreign-born, and working families with children. I have argued that this study illustrates three points of general applicability: (1) the method of tax enforcement can affect the distribution of the tax burden; (2) the tax distribution arising from imperfect enforcement can be *preferable* to one arising from perfect enforcement; and (3) although rigorously evaluating the post-enforcement tax distribution is informationally demanding, I have demonstrated that it can be done. Perfect enforcement is impossible, and deviations from perfect enforcement can be random and (comparatively) innocuous, or they can be driven by factors that are normatively relevant. Legal scholars have an important role to play in understanding these patterns and alerting lawmakers to the unexpected effects of laws and regulations on the allocation of the tax burden.

What is less clear at this stage is what specifically lawmakers ought to do to address undesirable enforcement effects. Among the questions that should be answered before crafting a response are whether the mechanisms of enforcement or the substantive tax law are the right place to fix undesirable outcomes, and whether the substantive law places constraints on the feasibility of different enforcement mechanisms. In addition to enriching the tax policy discussion, there are theoretical implications of a more nuanced view of enforcement. It is typical in both political philosophy and public economics to evaluate tax systems from an “ideal” perspective, assessing fairness or efficiency under the assumption that they are perfectly enforced and that there is full compliance.¹¹⁶ Of course, compliance and enforcement are not perfect. This imperfection derives from the availability of administrative resources, the discretion of the relevant authority

¹¹⁶ See, e.g., Kroft, *supra* note 106 (“One of the central assumptions in the theory of social insurance provision is that all agents who are eligible for benefits claim them.”) At the same time, the literature on tax law compliance and enforcement is voluminous. For a summary of theoretical and normative work on these topics, see Joel Slemrod & Shlomo Yitzhaki, *Tax Avoidance, Evasion, Administration*, 3 HANDBOOK OF PUBLIC ECONOMICS 1423 (2002). There has also been research exploring the effects of self-reporting on law enforcement, particularly in the environmental regulation context. See, e.g., Louis Kaplow & Steven Shavell, *Optimal Law Enforcement with Self-Reporting of Behavior*, 102 J. POL. ECON. 583 (1994) (incorporating self-reporting into an economic model of law enforcement); Robert Innes, *Self-Reporting in Optimal Law Enforcement When Violators Have Heterogeneous Probabilities of Apprehension*, 29 J. LEGAL STUD. 287 (2000) (introducing differences across individuals in the probability of apprehension to the model of self-reporting); Robert Innes, *Remediation and self-reporting in optimal law enforcement*, 72 J. PUB. ECON. 379 (1999) (exploring effects of adding remediation to a model of enforcement with self-reporting); Robert Innes, *Violator Avoidance Activities and Self-Reporting in Optimal Law Enforcement*, 17 J.L. ECON. & ORG. 239 (2001) (studying self-reporting enforcement regimes when individuals take actions to avoid apprehension.)

and, in many contexts, the decisions of regular people to report the existence of the conditions to which legal consequences should be assigned. Scrutinizing standard conclusions after differences in enforcement and takeup are taken into account may lead to a reappraisal of the efficiency and equity of these systems.

APPENDIX

Table 1: Property Valuation Summary Statistics by Escrow Use and Year

		2008		2009		2010	
		No Escrow	Escrow	No Escrow	Escrow	No Escrow	Escrow
Prob. of Appeal	Mean	0.32%	0.15%	0.29%	0.12%	0.37%	0.16%
	SD	5.62%	3.87%	5.39%	3.46%	6.09%	3.95%
Prob. of Appeal Win	Mean	10.42%	11.16%	13.40%	14.09%	10.75%	14.23%
	SD	1.82%	1.29%	1.98%	1.30%	2.00%	1.49%
Current FMV	Mean	649,210	580,797	622,193	544,821	606,783	524,775
	SD	867,080	345,294	894,666	328,503	902,396	329,559
Current Assess. Value	Mean	20,255	20,032	20,771	20,615	21,424	21,265
	SD	22,347	11,167	23,036	11,586	23,992	11,917
Current Tax Liability	Mean	3,281	3,244	3,549	3,523	3,720	3,692
	SD	3,619	1,809	3,936	1,980	4,166	2,069
FMV Change	Mean	-27,656	-32,920	-18,519	-18,414	6,476	-36
	SD	297,547	84,121	445,945	55,726	352,318	99,477
AV Change	Mean	473	672	567	733	506	500
	SD	3,245	2,314	3,094	1,825	3,266	2,129
Tax Liability Change	Mean	262	293	156	184	88	87
	SD	603	407	553	322	567	370
Overvaluation (Zillow)	Mean	18,597	20,094	-1,068	-5,200	17,882	17,609
	SD	157,077	93,697	195,447	64,671	173,596	96,131
Overvaluation (block)	Mean	-3,577	5,049	-6,388	5,475	-7,439	6,215
	SD	455,387	143,155	442,036	147,920	406,179	157,907
Tax Savings (Zillow)	Mean	-2,347	-1,754	-2,411	-1,785	-2,269	-1,484
	SD	4,788	2,203	4,271	2,127	4,808	2,343
Tax Savings (block)	Mean	-2,718	-1,922	-2,609	-1,693	-2,659	-1,623
	SD	5,919	2,290	6,740	2,409	6,536	2,572
N		290,753	310,779	294,345	314,507	289,502	319,350

Table 2 : NYC HVS Household Summary Statistics by Escrow Use and Year

		2008		2011	
		No Escrow	Escrow	No Escrow	Escrow
Male HH	Mean	51.22%	53.63%	51.03%	53.71%
	Std.Er.	0.76%	0.74%	0.66%	0.65%
Year Moved In	Mean	1978	1994	1979	1995
	Std.Er.	0	0	0	0
U.S. Born	Mean	48.40%	33.60%	49.20%	33.61%
	Std.Er.	0.76%	0.70%	0.66%	0.61%
Unit Value	Mean	474,157	456,407	501,541	477,934
	Std.Er.	4,718	4,340	4,662	4,254
Mortgage	Mean	30.78%	98.55%	31.67%	98.88%
	Std.Er.	0.71%	0.18%	0.62%	0.14%
% White	Mean	60.59%	41.39%	60.25%	40.71%
	Std.Er.	0.75%	0.73%	0.65%	0.64%
% Black	Mean	18.75%	29.84%	18.28%	29.52%
	Std.Er.	0.60%	0.68%	0.51%	0.59%
% Hispanic	Mean	9.09%	15.19%	9.15%	15.25%
	Std.Er.	0.44%	0.53%	0.38%	0.47%
% Asian	Mean	10.66%	12.93%	11.47%	13.72%
	Std.Er.	0.47%	0.49%	0.42%	0.44%
% Child Under 18	Mean	23.05%	50.08%	22.58%	49.33%
	Std.Er.	0.64%	0.74%	0.55%	0.65%
People in Household	Mean	2.59	3.36	2.61	3.40
	Std.Er.	0.02	0.02	0.02	0.02
Income Per Person	Mean	28,582	31,292	30,531	32,055
	Std.Er.	496	578	558	514
All Wage Income	Mean	49,825	77,751	51,590	80,387
	Std.Er.	1,050	1,063	957	1,010
All Social Security	Mean	6,890	2,097	7,333	2,234
	Std.Er.	136	87	127	80
All Retirement/Disability	Mean	4,626	1,960	4,964	2,005
	Std.Er.	217	134	192	118
N		4,513	4,982	5,947	6,375

Table 3 : NYC HVS Household Summary Statistics by Escrow Use and Year, Households with Mortgages

		2008		2011	
		No Escrow	Escrow	No Escrow	Escrow
Male HH	Mean	54.71%	53.69%	54.40%	53.75%
	Std.Er.	1.37%	0.74%	1.17%	0.65%
Year Moved In	Mean	1990	1994	1991	1995
	Std.Er.	0	0	0	0
U.S. Born	Mean	41.97%	33.42%	44.17%	33.47%
	Std.Er.	1.36%	0.70%	1.17%	0.62%
Unit Value	Mean	498,249	457,258	517,628	478,832
	Std.Er.	9,264	4,388	8,610	4,292
Monthly Mort. Payment	Mean	1,507	1,334	1,680	1,574
	Std.Er.	81	42	64	34
% White	Mean	45.88%	41.16%	46.55%	40.53%
	Std.Er.	1.37%	0.73%	1.17%	0.64%
% Black	Mean	22.51%	29.89%	22.26%	29.56%
	Std.Er.	1.15%	0.68%	0.98%	0.60%
% Hispanic	Mean	13.89%	15.28%	13.44%	15.32%
	Std.Er.	0.95%	0.54%	0.80%	0.47%
% Asian	Mean	16.26%	13.00%	16.50%	13.78%
	Std.Er.	1.00%	0.50%	0.87%	0.45%
% Child Under 18	Mean	47.21%	50.35%	45.24%	49.52%
	Std.Er.	1.37%	0.74%	1.17%	0.65%
People in Household	Mean	3.38	3.37	3.36	3.41
	Std.Er.	0.04	0.02	0.04	0.02
Income Per Person	Mean	76,115	78,148	78,162	80,722
	Std.Er.	2,164	1,071	1,924	1,017
All Wage Income	Mean	76,115	78,148	78,162	80,722
	Std.Er.	2,164	1,071	1,924	1,017
All Social Security	Mean	2,842	2,039	3,233	2,191
	Std.Er.	182	87	173	80
All Retirement/Disability	Mean	2,503	1,929	2,828	1,982
	Std.Er.	279	134	254	118
N		1,456	4,914	1,949	6,307

Table 4: Conditional Fixed Effect Logit Estimates of the Causes of Appeals, Whole Sample

	(1)	(2)	(3)	(4)	(5)	(6)
Escrow	-0.503*** (0.147)	-0.509*** (0.144)	-0.502*** (0.147)	-0.504*** (0.145)	-0.520*** (0.146)	-0.516*** (0.148)
Tax Saving (Zillow)	0.018* (0.008)		0.018* (0.008)			
Tax Saving (vs. Block)		0.058*** (0.017)		0.059*** (0.016)		
Overvaluation (Zillow)						2.63e-6 (7.89e-04)
Overvaluation (vs. Block)					8.17e-04 (8.50e-04)	
Tentative Tax Bill					0.176*** (0.027)	0.182*** (0.030)
SBA Win-Rate	0.414 (0.414)	0.251 (0.399)				
Zip Code Win-Rate			0.507* (0.250)	0.572* (0.243)	0.683** (0.245)	0.630* (0.252)
2009	-0.306*** (0.059)	-0.331*** (0.057)	-0.316*** (0.057)	-0.362*** (0.056)	-0.465*** (0.056)	-0.412*** (0.059)
2010	0.123 (0.064)	0.096 (0.061)	0.105 (0.058)	0.048 (0.055)	-0.083 (0.058)	-0.027 (0.062)
Property Fixed Effects	Y	Y	Y	Y	Y	Y
N	6771	7311	6697	7238	7253	6697
Pseudo R2	0.018	0.020	0.019	0.022	0.029	0.027
Log Likelihood	-2432.3	-2620.4	-2403.8	-2590.1	-2575.8	-2382.9

Standard errors in parentheses. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Tax savings and liabilities are per thousand dollars. Overvaluations are per ten thousand dollar increment.

Table 5: Conditional Fixed Effect Logit Estimates of the Causes of Appeals, Manhattan Excluded

	(1)	(2)	(3)	(4)	(5)	(6)
Escrow	-0.485** (0.148)	-0.518*** (0.146)	-0.484** (0.148)	-0.514*** (0.147)	-0.540*** (0.149)	-0.501*** (0.150)
Tax Saving (Zillow)	0.040** (0.015)		0.039* (0.015)			
Tax Saving (vs. Block)		0.074*** (0.020)		0.074*** (0.020)		
Overvaluation (Zillow)						0.001 (0.001)
Overvaluation (vs. Block)					0.002 (0.002)	
Tentative Tax Bill					0.300*** (0.041)	0.293*** (0.041)
SBA Win-Rate	0.340 (0.419)	0.270 (0.405)				
Zip Code Win-Rate			0.441 (0.253)	0.588* (0.247)	0.647** (0.249)	0.563* (0.256)
2009	-0.294*** (0.060)	-0.347*** (0.058)	-0.305*** (0.059)	-0.381*** (0.056)	-0.508*** (0.058)	-0.439*** (0.062)
2010	0.143* (0.065)	0.093 (0.063)	0.124* (0.059)	0.043 (0.057)	-0.117 (0.061)	-0.044 (0.065)
Property Fixed Effects	Y	Y	Y	Y	Y	Y
N	6537	6996	6475	6935	6950	6475
Pseudo R2	0.019	0.022	0.020	0.023	0.036	0.033
Log Likelihood	-2345.0	-2503.5	-2321.2	-2477.3	-2449.8	-2289.3

Standard errors in parentheses. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Tax savings and liabilities are per thousand dollars. Overvaluations are per ten thousand dollar increment.