Virtual Tax Evasion
A Survey Based Study of Use Tax Compliance among College Students

An Honors Thesis for the Department of Economics
By Pamela Swidler

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I. Introduction

While most people are familiar with the state sales tax that they have to pay every time they take a trip to a store, not many know about an associated tax called the use tax. The use tax is an extension of the sales tax and is owed on any goods purchased outside of the state on which no other state's sales tax is paid and which are going to be brought back into the state for use. While this may seem like just another formality mixed up in a very complicated tax code, it has evolved into something much larger. The use tax has been the topic of an intense constitutional debate for decades, and is currently a heated issue among politicians, state governments, and economists because of its implications on the multi-billion dollar internet commerce industry.

Internet or out of state vendors are not required to collect the tax from consumers directly as is the case with the sales tax for in state vendors, making compliance voluntary. The consumer can either file directly with the state or fill in a line in their state income tax form. In either case current compliance is very low, except for purchases that are easy to track and need to be registered, such as cars or boats. As might be expected, especially as internet sales continue to soar, use tax enforcement is very difficult. Knowledge of the tax itself is low, creating another impediment to enforcement and potential collection of the tax.

Many people may not even realize, but they are not paying sales tax on a majority of internet and catalog purchases. To many consumers this aspect of online buying seems to have been taken for granted during the e-commerce craze of the past several years; but such is not the case for state officials who lose out on tax revenue from many of these transactions. Buying goods over the internet or by catalog is in a way like leaving the state to buy goods and services in a different area, even though now this may be done from the comfort of one's own living room. In these cases the apportioned sales tax often gets lost because of the type of transaction.
Meanwhile, main street retailers selling the same goods are legally responsible for collecting the tax from the consumers. This leads to a question of the possible incidence of this tax. As for the current retail sales tax, these main street, or "brick and mortar," retailers bear the statutory burden of collecting the tax. If internet businesses not required to collect a use tax can represent strong competition to these retailers by offering this automatically lower price, then main street vendors might have to lower their prices in order to stay competitive. This forces an added economic burden of having to accept lower profits in order to keep up with these virtual retailers. The use tax currently places the incidence on consumers, as they are expected to remit the tax back to the state, while the remote vendors they purchase from do not have a statutory responsibility or economic need to change their prices.

State governments claim to that these lost revenues are large, and as a result are calling for online and remote vendors to collect the tax from the consumers and then hand it back over to the state of residence. Very little, however, has been done in the past to increase enforcement or compliance with the tax among consumers. Is there a realistic way to create voluntary compliance for this tax? Failing to pay the use tax is tax evasion, not avoidance, and this means facing a fine or penalty for being caught. Given a choice to comply when the risk of a penalty is zero, none but the exceedingly honest would pay. If the risk is increased, however, compliance rates may rise. The obvious policy question is whether a system can be made simple enough to make compliance easy and realistic, and whether voluntary compliance will succeed where other efforts to force compliance have not. The survey results permit me to ask whether simple schemes exist for increasing compliance.

Implicit in the idea of voluntary compliance are attitudes surrounding the tax itself. I explore these attitudes and use tax compliance issues by undertaking a web-based survey of
Tufts University students. In order to measure the economic significance of these student reactions I looked extensively into student purchasing habits and whether having a “tax free” internet actually leads students to buy more online. I also examine students’ willingness to comply with the tax given different situations, using factors discussed in the literature on basic tax evasion theory. The survey explores respondents’ attitudes toward not only these specific tax laws, but also collects information on associated demographic or socioeconomic characteristics.

In the remainder of this paper I begin with a background on the constitutional problems that prevent all vendors from collecting the tax, because in the absence of these problems the use tax would automatically be collected and remitted back to the correct state. Then there will be a review of the previous literature on the use tax and theories of tax compliance, a short explanation of the theory and models from which I base my assumptions, followed by a description of the survey, how it was created, and how the data was collected. This will be followed by a results section and a conclusion.

II. Background – Constitutional Issues

a. Commerce Clause

Many of the enforcement issues surrounding the use tax stem from basic constitutional issues. Internet sites, out of state vendors, and mail order catalogs are not forced to directly charge the tax because of decisions by the Supreme Court over the past fifty years. Article I Section 8 of the U.S. Constitution, also known as the commerce clause, gives Congress the power to regulate commerce “between the several states,” making it Congress’ responsibility to ensure the free flow of commerce among the states. Each individual state has the power to tax all goods, services, and transactions within that state. The most common way states tax these
transactions is through a sales tax, and the rate of the tax is thus left to the discretion of the given state. Currently forty-five states employ a sales tax. New Hampshire, Delaware, Oregon, Montana, and Alaska do not.

All states with a sales tax also have laws on the use tax. The use tax was established as a means of imposing the tax on residents making out of state purchases, so state and local governments can collect the lost sales tax revenue while staying within their constitutional limits. Since the commerce clause prevents states from taxing interstate business directly, the use tax provides a way for the state to tax the goods without taxing the transaction itself.

Are states overstepping their constitutional rights by implementing this tax? The constitutionality of the use tax itself was first upheld in 1937 after being challenged in Washington by an out of state construction company who brought in almost $1 million in equipment to use in building a dam. In this case of *Hermeford v. Silas Mason Co. (300 U.S. 577 [1937])*, the construction company, Silas Mason, claimed that the use tax, also known at this time as a compensatory tax, violated the commerce clause by infringing on interstate commerce and that taxing items only being used within the borders of a state lay beyond the states' power to tax. The Supreme Court disagreed, holding that the tax itself stands, because the ability to use something is just one of the many parts of ownership which the state can tax in any way that it decide. In addition, the tax on use is not made on interstate commerce, but occurs after the transaction has taken place, not on the action itself. The decision, however, did not indicate the specifics of what it means to use something within a state. "Use" can also be taken to mean using the resources of a state in doing business, and it is the intricacies of this definition that caused, and continues to cause, many conflicts regarding the tax.

In the past states have made many attempts to make remote sellers collect the tax directly from consumers and remit the tax back to the state. Many corporations in turn have tried to challenge the constitutionality of the use tax, claiming that it is an improper extension of states rights, in that it is taxing interstate commerce when that is a right given solely to the federal government. Since the inception of the use tax in the early 1930's there have been hundreds of cases brought by states after various vendors have not paid the tax, and several have made it to the Supreme Court. National Bellas Hess v. Department of Revenue of Illinois (386 U.S. 753 [1967]) is one of the prime examples of a case in which the Court did not force a seller to collect the tax. An Illinois statute required that out-of-state merchants selling to consumers in the state collect a use tax and pay the tax directly back to the Illinois Department of Revenue. As an out-of-state mail order business, National Bellas Hess had no stores, warehouses, factories, outlets, offices, or physical presence in Illinois, but instead advertised in the state and sent catalogs to its residents twice a year. Illinois residents who purchased anything from this catalog received their merchandise through the mail. Bellas Hess refused to pay the tax claiming it violated the commerce clause and the due process clause of the Fourteenth Amendment. In his majority opinion, Justice Stewart saw that under both clauses there must be a “minimum contact” or “nexus,” under both clauses, with the party involved and the state in order to force collection. If these requirements were not met, then the firm was not using any Illinois resources for which it should have to give something in return. If these requirements were met then Bellas Hess would have to collect the tax from its Illinois customers and repay the state. Noting a strong difference between contacts with the state simply by mail, where there is no physical contact, and having an
actual physical presence in the state, the majority held that a connection by mail did not satisfy the nexus requirement.

In his *Bellas Hess* opinion, Justice Stewart also considered the large burden that would fall on interstate commerce if the tax were to be upheld. If so, every district in every state could require this be done by all mail order and remote sellers. In 1967, the time year of the *Bellas Hess* opinion, the number of tax districts in the country numbered around 2,300, a number which has now increased to 7,500 as of 2003¹, each with different tax rates and regulations. With the potential to create a bookkeeping disaster, this would strongly discourage firms from selling goods outside of their own state.

Justice Fortas, in his dissenting opinion, disagreed on the grounds that the burden of collecting this tax is no different than what local sellers have to go through in collecting sales taxes. He stated that the Court is underestimating "man and his machines" and the extent to which they can complete these transactions. He believed this over 35 years ago when computer technology did not exist at even a fraction of what it currently does. In considering this aspect of the majority opinion today, with the help of modern computer technology the burden facing firms, while still being potentially large, is far more comprehensible than it was in 1967, as most transactions are digitally recorded regardless of the type of seller.

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¹ [http://www.ksg.harvard.edu/project1/politics.html](http://www.ksg.harvard.edu/project1/politics.html)

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Until 1977, the decisions on cases involving the tax varied in that some upheld the use tax and forced the vendor to pay the state, while others like *Bellas Hess* that involved very similar situations would hold just the opposite. The landmark case of *Complete Auto Transit Inc.*
v. Brady (430 U.S. 274 [1977]) created a four part test that should be applied to a situation involving the use tax to declare when the vendor is required to collect the tax.

The first part of this test is one that is used most by internet and out of state companies to avoid collecting the use tax the company must have a significant "nexus" with the state. While the wording still leaves future cases open to interpretation, this portion of the test has come to mean that the company must have a significant physical presence within the state. For example, Amazon.com can say they are not responsible for collecting the use tax in Massachusetts because they do not have any warehouses or other presence in the Commonwealth. However, they would be responsible in the state of Washington because they own at least one warehouse in the state.

Similar to the Bellas Hess decision, the court held that connection only by mail or common carrier did not constitute the proper "nexus." The second part of the test requires that tax be fairly apportioned to local activities. In order for this to be satisfied, there would have to be a credit to the tax if a portion was paid on a similar tax in another state; otherwise there is the chance of double taxation. The third part requires that the tax not discriminate against interstate commerce by somehow preventing the free flow of interstate business by forcefully preventing people from purchasing goods from out of state. The final element of test says that the tax has to be fairly related to benefits provided by state to the taxpayer, again similar to the related aspect in the Bellas Hess opinion.

Quill Corporation v. North Dakota – 1992 – Precedent holds next to modern standards

The most recent decision based around this test came in 1992 in Quill Corp v. North Dakota (504 U.S. 298 [1992]). This ruling currently holds as the application of state tax collection for remote vendors. While the result was similar to that of Bellas Hess and Complete Auto in that
the mail was not considered a significant "nexus" with the state, the decision did recognize the technological revolution occurring over the past twenty five years. These past years brought about a wholly new market and to have a substantial economic contact with a state does not require as much as it has in the past. Justice Stevens, in his majority opinion, takes this to mean that the "minimum contact" rule of the due process clause should not be seen as strictly as that of the commerce clause. With this new and looser interpretation of the due process clause, a connection only by mail delivery might be enough to qualify. This decision then overrules the section of Bellas Hess that invalidates a tax where the contact between the state and the merchant is only by mail, based on the due process clause of the Fourteenth Amendment.

Even so, this change in scope of one clause did not change the scope of the commerce clause. The tax in question in Quill remains subject to the same test, and at the same scrutiny level, established by Complete Auto. The Bellas Hess "bright-line" rule that connection by mail does not constitute a "nexus" under the commerce clause still holds. Justice Stevens sees the commerce clause and the question of nexus, the first part of the test, to be held in a different regard than the "minimum contact" requirement of due process. In addition, for the same reason that the Bellas Hess use tax create an unnecessary burden on interstate commerce by forcing all out of state sellers to comply with tax regulations in many districts, so does the North Dakota tax. Justice Stevens and the majority kept this bright line rule to establish a recognizably strong precedent in this area, admitting that past interpretations by the Court in this subject in the past have been inconsistent. If this bright line rule stands in Quill, it acts as a stamp of approval on Complete Auto, creating a solid foundation for future cases.

2 In Quill Corp v. North Dakota (504 U.S. 298 [1992]) these words are often used by the Justices to describe the Bellas Hess holding that connection by mail does not constitute nexus.
State governments and advocates of the tax were left surprised and outraged by the *Quill* decision. They had practically begun counting their earnings before the Court turned them back to lobbying Congress for legislation, claiming that the modern economy requires modern interpretation and action. Justice Fortas' dissent in *Bellas Hess* more than 35 years ago noted that the burden of having to collect taxes from many different districts is not as bad as it may seem because of advances in technology. In *Quill* the majority changed the interpretation of the due process clause because of the changing markets, but did not consider the part of the burden that could be lifted as a result of the advances in computer technology and other market aspects that make record keeping easier than it was in the time of *Complete Auto*.

Just as *Complete Auto* set a standard in commerce clause interpretation for remittance of the use tax, *Quill* set a modern interpretation and rule for the tax that continues with this strict view. While *Quill*'s test does leave room for further interpretation and change as times continue to change, it has sent a message about what is acceptable in today's economy, and most states do not like what they are seeing. Even though the use tax statute is still valid, the decision and the state of commerce in the twenty-first century make it collecting the tax extraordinarily difficult. The *Quill* decision ends by all but directly asking Congress to consider legislation in this matter.

The disagreement between state governments and taxpayers on the use tax nexus threshold established by *Bellas Hess* and *Quill* is just as strong with respect to interstate sales conducted over the internet as it is with respect to interstate mail-order catalogs. The Supreme Court has seen many different types of connections and situations existing between states and firms, but has yet to encounter those that may evolve with up technology. Internet commerce has been the topic of Congressional legislation, research, and debate, but has yet to be examined by
the Court. As it stands now, goods bought over the internet are considered a form of interstate commerce and are almost tax free except in the case where the merchant has a physical presence in the buyer's state. Under the Quill precedent, states do not have a way of making these internet merchants charge the use tax directly, because the internet technically works very much like a mail order catalog.

Due to the ever growing market for e-commerce, a situation similar to that in Quill may occur, where there is a need to change because of a different market environment. On the chance that this could happen and a state was to try and directly challenge Quill by making an online merchant directly collect the tax, the court would have to strongly consider the unique nature of the internet. The internet is widely available to the general public, and millions of people have access to it directly from their homes twenty four hours a day. Even though the merchant itself may be situated in another state, it has an online store practically sitting in people's living rooms. There is an aspect of this that may have an effect on what constitutes a nexus and could alter the Quill decision.

Many confuse the decision in this case with the Internet Tax Freedom Act, first passed in 1998 and reapplied in 2001. The Internet Tax Freedom Act prohibits the taxation of internet access. The goal of the act was to encourage growth of the internet and electronic commerce, not to prohibit state and local governments from collecting taxes due to them. In fact one of the arguments against the act was that it would make it extremely hard for states to collect these taxes by the impression that the name and the nature of the act send out. The act specifically states is Section 1101 (b).

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5 Quill Corp v. North Dakota (564 U.S. 1992) — Lexis-Nexis — holding that an out of state merchant with connection only through mail to a consumer may not directly collect the use tax from the state.

6 http://www.thecca.org/nttaxes.html
"... Nothing in this title shall be construed to modify, impair, or supersede, or authorize the modification, impairment, or superseding of, any State or local law pertaining to taxation that is otherwise permissible by or under the Constitution of the United States or other Federal law and in effect on the date of enactment of this Act."

In other words, sales and use taxes still apply to these purchases as they are constitutionally applicable independent of vendors' obligation to collect the tax directly. Despite this detail, the name of the bill can be deceiving and many people may take this to mean that no taxes on internet purchases are due.

These problems led several state governments and revenue offices to create the Streamlined Sales Tax Project (SSTP) four years ago. The main goal of this project is to simplify and modernize sales and use tax laws to make collection easier for all types of vendors. As the name suggests, this includes making these laws uniform among the states. This includes implementing the same forms, auditing practices, and exemptions in all states and districts, but not necessarily creating a national sales tax rate. Instead states are allowed a single tax rate, and local jurisdictions are allowed one rate as well. While even this may seem complicated, as the process currently stands, local sectors may have many different rates and change these rates periodically. Changes then become difficult to track and make collection yet more difficult. As of November 2003, 40 states and the District of Columbia were involved in the SSTP. In an effort to help solve the problems associated with the many different tax districts, companies such as the Sales Tax Clearinghouse offer online software that works on the basis of zip codes and calculates the tax on a given purchase for a consumer in a certain district.

The rise in internet commerce has jumpstarted state government awareness of the use tax and the potential for lost revenue, but this is an issue that has existed for far longer than the past.

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1 http://www.ecommercecommission.org/p/ITFA.htm
2 http://www.streamlinedsales-tax.org/
3 http://btate.com/index.html
five years. There has been lost revenue from mail order catalog and out of state sales, but for
decades there has never been this level of government interest in the issue. It is this sudden rise
in attention towards the tax and possible enforcement that incites a stronger look into voluntary
payment, and possible efforts to enforce the tax and encourage compliance.

III. Review of Literature

a. Revenue Loss from the Use Tax

One of the obvious questions stemming from this issue involves the degree of the
relevance of the use tax. Is the amount of revenue lost from these purchases from remote vendors
significant? The general sales tax is one of the largest sources of state revenue and make up
approximately one third of state tax collections (Goolsbee and Zittrain, 1999). For in state
vendors, collecting the sales tax seems relatively simple, and it is easy to calculate the number of
goods and services purchased in a given jurisdiction. The nature of most transactions involving
the use tax involving a large number of out of state and virtual vendors, complicates the task of
eumerating the revenue lost due to the internet or mail order purchases. Not only is potential
use tax revenue lost on the purchase, but there is also the chance that local retailers are losing out
on business because of people choosing instead to buy from internet or remote vendors. This
sparks a debate among economists on the importance of the loss in revenue from the lack of
enforcement of the use tax. Some believe that the loss is modest and not worth the high cost of
increasing enforcement. Others believe that with the growth in e-commerce, use tax losses will
increase sharply in the near future and either simplifying the laws or finding a form of
enforcement is very necessary. While the amount of purchases made on the internet and the rate
of growth in the coming years is important, another factor that has to be considered is the business taken away from local retailers by internet sellers.

While it is commonly accepted that internet commerce will grow significantly over the next few years, this question of the amount of loss still remains. Austin Goosbee is among those who believe that the revenue loss is currently moderate, and to keep from collecting the tax for at least a few years will help develop the internet sales industry. He explains that many estimates may be exaggerated by simply taking the amount of sales and multiplying this amount by the national average sales tax rate, approximately 6.33% (Goosbee, 2000). According to his study, after taking away all non-taxable items, this taxable online revenue in 1998 totaled around $2.5 billion, and applying the 5.33% average tax rate, yields a national revenue loss of only $157 million. His projections with similar calculations predict a revenue loss of $3.5 billion in 2003, representing only about 2% of sales tax revenue. He argues this number is not considerable enough to constitute an urgent situation.

Another aspect Goosbee touches on is estimated mail order sales which total approximately $55 billion each year, with yearly losses totaling as much as $6 billion (Goosbee, 2001). To keep this number in perspective, another estimate in 1988 by the Advisory Commission on Intergovernmental Relations approximated that mail order sales alone could create over $21 billion in uncollected use tax liabilities (Trandel, 1992). While Goosbee argues that these taxes on catalog goods have been going uncollected for years, and in his words, “has not bankrupted state budgets,” these numbers make investigating voluntary compliance for all aspects of the use tax important.

In several of his studies, Goosbee argues for giving equal tax treatment after what he simply labels as “a few years.” While there is no definite amount of time proposed, he is
seemingly referring to a time when internet commerce has become established to the point that implementing a tax would not cause a major downturn in sales. Currently, three years after Goolsbee's most recent paper, internet commerce has been growing faster than almost anyone expected, and if there was ever a time for equal treatment, it may be fast approaching if not overdue.

On the other hand, others believe that while the current revenue losses are not major, in the very near future they will grow exponentially and adversely affect state budgets. Donald Bruce and William Fox have brought together several studies that advocate looking ahead when making policy choices (Fox and Bruce 2000). After all, policy decisions are made and based on controlling what occurs in the future. In contrast to Goolsbee's studies which predicted a $3.5 billion loss in revenue in 2003, Fox's study in 2000 forecasted a $10.8 billion revenue loss in 2003, up from $1.23 billion in 1999 (U.S. GAO, 2000).

In 2000, the United States General Accounting Office (GAO) prepared a report estimating these amounts in order to present the results to Congress who would be ultimately responsible for creating any guidelines that addressed the issue. Their model gave much of the same information as Goolsbee in that they estimated in 2000 the size of total loss from internet sales stood at approximately 2% of aggregate sales and use tax revenues, or around $3.8 billion (U.S. GAO, 2000). The GAO estimated revenue loss on total remote sales to be $9.3 billion, or around 5% of aggregate sales and use tax revenues. Their estimates for the year 2003 expect losses as high as $12.4 billion on internet sales alone, while losses on all remote sales may jump to $20.4 billion. While these numbers are based on very uncertain assumptions, increases of that magnitude over just a three year period seem deserving of attention. The GAO notes the potential
for a large rise in revenue losses from 2000 to 2003 along with the rapid changes and advancements that go hand in hand with internet commerce.

The online retail world has created a market for goods and services that have not been possible before, and this market is available to a wide range of consumers. No data are currently available for 2003, but estimates indicate that the GAO estimates. For the week before Christmas in 2003, arguably the busiest shopping time of the year, online sales were up 43% from the same time in 2002. Now that the internet has become a virtually tax free zone, and has created an eclectic array of vendors, states are not only losing out on the tax money from these purchases, but from the potential purchases that may have instead been made in local stores instead of online.

b. Crime and Punishment – Development to Theory of Tax Evasion

Aside from the fiscal relevance of the use tax revenue, the basic truth behind this question is that not paying the tax is in fact tax evasion. One of the forerunners in studying the economics of law was Gary Becker, who in his landmark essay on crime and punishment in 1968 discussed how to find the optimal amount of enforcement for a certain crime based on one’s likelihood to make a decision to commit crime. The choice to break the law becomes the same as any other decision, one that involves weighing costs against benefits. For one breaking the law, the cost is the chance that they will be caught, arrested, and given a designated punishment, while the benefit is whatever one may receive from committing the crime. Usually, more potential profit from committing a crime constitutes a harsher punishment and greater chance of being apprehended. This chance varies the amount of risk that one is willing to take when committing a certain crime. It is this theory that determines the amount and optimal enforcement for a given crime. Making an efficient system requires applying the optimal amount of enforcement,

calculated by the cost of catching offenders, the punishment involved with the crime, and the response of offenders to changes in the enforcement level (Becker, 1968). This response depends on the risk level of the crime and the gain from the crime compared to possible penalties. Becker’s model tells us that the strongest response from a possible criminal is created by the probability of being apprehended, as opposed to a change in the actual punishment.

1. Voluntary Compliance

One of the most widely cited researchers in this field, Allingham and Sandmo, created a basic model for tax evasion based on Becker’s logic. (Allingham and Sandmo, 1972). Recently Joel Slemrod used this approach to look into voluntary compliance and the decision to comply or evade. He states his questions of compliance in an interesting manner, inquiring why most people do not choose to evade after simply examining the probability of being audited and the possible gains from evading. As he explains, “The puzzle is not to explain why people evade, but rather why people pay taxes—in the context of the standard economic model, people who voluntarily comply are exhibiting nothing short of ‘pathological honesty’” (Slemrod, 1998). Most citizens pay out of fear that they will have to deal with the ever-dreaded Internal Revenue Service, the ultimate form of tax enforcement, or because they believe it is their “civic duty” to do so. He basically calls for looking into a more efficient and fair tax system, one that does not invite high levels of evasion, as those who do are basically free riding the system while others are paying for it. Similarly, remote vendors are able to coast along not having to collect taxes from patrons while their “main street” counterparts have to deal with the burden of charging customers a higher price when all is said and done.
In a recent study, Slemonrod conducted a large survey on income tax evasion in Minnesota by sending one group of a random sample a letter informing them their return would be “examined closely,” while sending another control group nothing (Slemonrod, 2001). His aim in doing so was to examine optimal enforcement for income taxes and the reactions of the taxpayer to this extra chance of a penalty. Those with low or middle income levels that did receive the notice in fact did increase their reported earnings. While this increase averaged only around 2%, reports for high income households actually decreased. One possible explanation for this discrepancy, he explains, other than that the wealthy may have sought professional help after receiving their notice, is that these high income individuals may find that the whole system is more controllable and that due to actions in previous years there is no need to make a drastic change. In contrast, in a study conducted examining the actions of college students, compliance actually increased with higher levels of income (Alm, Jackson, McKee, 1992). This study has some similarities to the one I implemented on the use tax in that it examines reactions to a situation where the probability of being caught evading increases.

Slemonrod is one of many who have undertaken studies into voluntary compliance and income tax evasion, and many have come to similar conclusions. Not many have examined the use tax in particular, however mainly because of the low enforcement levels which translate into low compliance levels. In 1992, just months after the Quill decision, Gregory Trandel published a study on use tax evasion, taking an alternative view on this type of noncompliance. He showed that stronger enforcement of the tax on mail order sales and cross border sales would cause market prices to rise and have a negative effect on the economy (Trandel, 1992). He explains that use tax evasion may actually have a positive effect because it encourages consumers to look outside of their usual retail market base for a variety of vendors. Trandel’s opinion is similar to
the more recent one that keeping internet virtually tax free allows it to grow as it is still in its early stages. While this may have been true of the internet several years ago, it is the level of burgeoning e-commerce profits that have caused such a sudden interest in finding ways to better enforce sales and use taxes, and people are now able to find different vendors with only a few keystrokes. Consumers, especially the more savvy ones, no longer need an incentive to look outside of their local retail market base if they can compare prices and window shop on a single website.

Gary Cornia, co-chair of the National Tax Association’s Communication and Electronic Commerce Tax Project, considers the possibility of voluntary compliance by remote vendors, but acknowledges that it is not possible without some type of incentive. Due to the constitutional limits remote vendors are not required by law to comply, but he is hoping for some policy initiative that would make the vendors voluntarily collect the tax in a simple manner, as opposed to what he sees as the more daunting task of creating and enforcing voluntary compliance amongst consumers? (Cornia, 2004) He explains several impediments that are preventing vendor compliance, one of the most obvious being that not having to collect a tax gives an automatic edge over retailers who are bound by a sales tax. In addition, complications with having to keep track of thousands of different tax bases. There is relatively inexpensive software available to help online vendors sort out this problem, so this apparently is not the main problem, being one that can be so easily fixed. Even if the Streamlined Sales Tax Project or state governments were to offer some incentives to those vendors who did collect the tax, there would still be other “free riders” who do not comply and basically take advantage of those that do.

While there have been other similar studies along these lines, few of the studies have focused just on voluntary compliance amongst consumers, which the following survey will
investigate. However, it is important to look at the compliance decisions of consumers in light of different enforcement techniques and agencies, along with the responsibilities of these remote vendors. Part of creating a higher compliance rate involves creating a higher enforcement rate, and even if vendors will not go as far as voluntarily collecting the use tax from the consumer they can still play an enforcement role. It is widely known that part of the lack of compliance with the tax is due to the general lack of knowledge of the tax, and out of state vendors or internet sites can inform the customer of its existence.

IV. Methodology

a. Theory and Economic Model of Tax Evasion

The majority of previous work involving sales and use tax evasion is based on examining the problems with the current laws that make enforcement difficult, and analyzing the significance of lost use tax revenue. While few have undertaken empirical analyses of use tax evasion, there is an extensive amount of study on income tax evasion. Both involve similar variables, but the current low compliance levels, enforcement levels, and large amount and array of transactions involving the use tax make requirements for analysis different. The fact that the majority of people generally understand the consequences and realities of federal income tax and the reputation of the IRS as a strong and harsh enforcement mechanism is undeniable. This reputation in and of itself creates an uncertain probability level that a return can be audited, resulting in having to pay even more money to the government and dealing with a long and painful process. The use tax does not have this to encourage compliance, and the level of knowledge and understanding of the tax is also extremely low.

In the majority of cases with the tax in question, it is not that an individual reports some transactions and not others, but that people do not report anything in general, either because they
simply do not know about the tax or they do and know that the chance of being punished for not complying is almost nonexistent. The real question in voluntary compliance of the use tax asks if it is possible to create any type of compliance, while in the case of income tax evasion it involves increasing compliance by having people report a number closer to or their exact taxable income. Another problem inherent to empirical analysis of either type of evasion is the issue of measurement. We have seen the large variability of estimates of the possible losses from failure to pay the use tax, and in the case of income tax it is not possible to simply ask someone the amount that was not reported on their previous returns. In the case of use taxes, measuring the exact amount and number of applicable transactions is difficult.

The goal in this analysis will be to examine students' reactions when learning about the tax. I will also attempt to quantify attitudes towards risk and penalty, out of state and internet purchases, and various demographic and personal attributes. The ultimate goal is to see how simple changes potentially affect future compliance or enforcement. These problems make it difficult to use just one model as my purpose varies from the majority of similar empirical studies, so I will use an economic model created to examine the factors affecting income tax evasion and one model to examine internet purchases and expand it to include factors relevant in this situation.

The economic model for the understanding of tax evasion is important here as it establishes the reaction to changes in enforcement rates and associated punishments and consequences. The model used as the basis for the majority of tax evasion literature and study today is one developed by Allingham and Sandmo in 1972. In this model a person's expected utility is derived from the following equation:

\[ EU = (1-p)U(I + t(y-x)) + pU[I - \theta(y-x)] \]  

(1)
Where \( p \) is the probability of detection, \((y-x)\) in the case of income taxes is the amount of evasion being actual income \((y)\) subtracted by the amount reported \((x)\), but in the case of the use tax it can be seen just as the amount evaded being the amount spent on goods subtracted by the amount reported. \( I \) is total after tax income, \( \tau \) the tax rate, and \( \theta \) is the fine rate.

Expected utility is based on the probably of being caught and fined, and thus affects the amount reported. The amounts that an individual chooses to report and evade are a function of the fundamental aspects of this model.

\[ x = f(I, p, \theta, \tau) \]  

It is relatively straightforward to theoretically see how \( x \) should increase with \( p \) and \( \theta \), a normal risk-averse person would want to avoid being fined with higher rates of \( p \), and avoid having to pay a higher \( \theta \). In the case of the use tax, the perceived \( p \) is practically 0, so the same reasonable student would have no reason to report any of their purchases. I will use this basic principle to analyze whether in fact students continue to react this way in the case of the use tax when there are potential increased levels of fine and enforcement.

Income becomes a very different issue in this study than in the normal instances of tax evasion because of the nature of the respondents. Most students do not have the same type of free flow of income that adults have, and often rely on their parents for a fraction of their "income," which basically money that they have on hand for books, food, and leisure expenses. However, they still budget this money in a similar manner, and the importance and tightness of this budget may rely on their family income and the lifestyle to which they have become accustomed. It is interesting to see if income has a similar affect on students' attitudes and decisions as it has shown to for adults.
For all intents and purposes the tax rate is not as much of an issue in the use tax scenario, as opposed to an income tax standpoint where varying tax bases have very different rates. The sales tax does not vary as much amongst states, and this project will concentrate on the Massachusetts sales tax rate, becoming a constant in this equation.

While finding the amount of evasion is important in income tax studies, it is assumingly 100% of due taxes on purchases in the case of the use tax. However, these dependent variables should be key factors in the analysis of students’ decisions, and how other aspects of students affect these factors.

b. Basic probit regression model

Goosbee uses a standard probit model to measure whether an individual has bought goods online against their local tax rate and various demographic and economic factors. He then extends this to assess not only whether they buy online, but what goods they buy online, in order to see if they are looking to avoid their local sales tax. I will conduct an investigation similar to this, but instead of using the tax rate as an independent variable, will use convenience preferences of buying online. While I did attempt several regressions using the sales tax rate in the students’ home states with both their buying frequency and whether or not they purchase certain goods, in no case did it prove to be significant, which makes sense since all spend the majority of their year in Massachusetts, so this rate is actually constant.

Due to the sort of questions asked in the survey, many answers are answered yes or no, or are ranked in several categories. This makes probit regressions, used when there is a binary dependent variable, one of the most useful in analysis. I also used several ordered logit regressions because of the several possibilities for ordinal dependent variables. Not many of these proved to be significant, but this fact turned out to be informative in and of itself. For these
types of logistic regressions, it is important to remember that the coefficient can not be interpreted in the same way as an OLS estimate, so for the probit regression I also include the marginal effects which describe a unit change in the dependent variable based on the independent variable.

V. Data

One of the largest problems in studying and measuring tax compliance, in addition to the methodological problems previously mentioned, is finding suitable and usable data. All of the data I use is taken from a survey I created and administered to undergraduates at Tufts University. I conducted the study over the internet using Websurveyor software, and published onto a website. An email with the link to survey was sent out to a random sample of 1650 Tufts University students. Each email address was selected randomly from the Tufts directory of students, and included with the package is software that prevents multiple responses from the same IP address, allowing each student to only take the survey once. The message in the email with the link explained that the information collected was for a senior thesis and that their responses would remain anonymous. Anonymity in this case is especially important due to the nature of the information and questions regarding laws and tax evasion.

One question that should be addressed before going any further, is simply: why college students? This is not a group that would normally be approached regarding tax issues and questions, but considering the context in which the use tax has become increasingly relevant, all everyday consumers such as college students, play a very important role. As previously explained, part of the reason for the recent interest in the use tax is the increase in internet sales, and college students are frequent internet users. In a study conducted earlier this year at the University of Massachusetts Amherst, 85.9% of the students polled said that they used the

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9 A copy of the survey instrument can be found in the appendix.
internet every day, while another 7.8% said almost every day. In addition, according to this survey the average student spends 3.46 hours on the internet daily.\(^{10}\) While being frequent internet users does not necessarily make students big internet spenders, it makes them a very strong target market for online vendors. There are several companies that specialize just in internet marketing aimed at the university age population. This is with good reason as one of the largest of these companies, The Student Monitor, reports that college students across the country spend a combined estimated $100 billion a year\(^{11}\), implying that possible lost revenue from their decisions regarding the tax is reasonably important. Students have money to spend, and the more time they spend on the internet the more they will spend it there.

The response segment does prove to be representative of the Tufts undergraduate population. For all but one aspect of race, gender, and location, it can be said with 95% level of certainty that the actual mean is represented by the sample population. (See TABLE 1) The one exception is the high response rate of Caucasians, survey response consisted approximately 63% of Caucasians, which is noticeably higher than the associated 56% of the actual Tufts population.

The actual mean falls just outside of the 95% confidence interval.

The survey contains questions not only in reference to attitudes towards use tax, the

\(^{10}\) [www.studentmonitor.com](http://www.studentmonitor.com) - Study conducted by Gary Maloney, the Coordinator of the High Education Program at UMass-Amherst

tax itself, and the risk factors of noncompliance, but also examines student purchases that are applicable to the tax, including internet and mail order goods. The first eight questions focus on the amount and types of goods that students purchase online and through mail order catalogs. Students are asked the amount that they spend buying goods online weekly and yearly, and are put into six spending categories. While obtaining an exact amount may have been preferable in analysis for added variability, I was skeptical about obtaining an accurate number because students may not know the exact amount, and may actually list one that is significantly off. A range, on the other hand, allows for an easier and more accurate estimation and they are not required to state an exact amount, allowing for more reliable results.

The types of goods purchased are also important as some are applicable to sales tax and others are exempt. If students are more inclined to buy goods that would be charged a use tax, then the associated increase in price would have more of an effect on their future decisions to buy those goods online. In addition, students who are more frequent online shoppers would be more affected by having to pay the use tax.

The next set of questions refer to opinions of the sales tax rate in the state of Massachusetts, a rate common to every student at Tufts despite their state of permanent residence. For a tax currently operating on a system of voluntary compliance, attitudes towards the use tax and that of the tax rate itself could have an effect on a future decision to comply.

Before collecting data that involves the use tax directly, it is first important to explain the tax to the survey respondent. This is necessary assuming that most students do not know of the existence of the tax or what it entails. They are then given a hypothetical situation, not involving an online purchase but one where they travel to New Hampshire and pay no sales tax on an item, where there is a use tax owed back to Massachusetts. They are asked what the probability, in
terms of percentages, of being caught would have to be in order to make them pay this tax given a certain rate of a fine. This number gives an idea of just how much risk they would be willing to take in not paying this tax. After this they are asked a simple yes or no answer if they will comply with the tax in the future now having learned the basics of it, and the reason for this decision.

Following this are questions examining possible outside influences or enforcement methods that may affect compliance. Respondents are asked how likely knowing someone else fined for not paying the use tax, a notice included with purchases, a pop up window after online purchases, an easier filing process, or promotion by local politicians, would be to influence their decision to comply with the use tax. The answer choices are given in three categories, VERY LIKELY, SOMEWHAT LIKELY, and NOT LIKELY.

The next set of questions examines opinions of the sales and use taxes along with state budgetary practices. Included is a question that mentions the Massachusetts large budget deficit, and asks what taxes they would support increasing in order to make up for the deficit. In addition, there is a question asking how much the respondent thinks the sales tax contributes to a state budget. In reality, sales tax collections contribute as much as, and in some cases more than, a third of total state revenue. While it is very unlikely students will know this number, their perception of the importance of sales tax revenue may affect their attitudes towards use tax. Respondents who have an idea of a state's reliance on this revenue are more likely to look positively on the tax, and thus more likely to pay.

Individuals' risk preference is important when it comes to any question of compliance as shown from the basic economic compliance model, so there are several questions that investigate respondents' general attitude towards risk, how risky they act in other situations where there is a
question of payoffs and losses. One involves a gamble while flipping a coin, one side results in losing one dollar and the other winning two dollars. Respondents as asked to specify and amount that would make them indifferent between taking the money and taking the gamble. Next the respondent is given a situation when they have $1000 to invest, and they can do so in four different ways. They are given the chances that they can make or lose money in each investment opportunity, and then are asked to split their money accordingly between the investments, some being riskier than others. Lastly, the respondent is asked to classify how he sees his risk preference on a scale from one to five.

The final group of questions involves basic demographic information. Included are questions on gender, families' income, state of permanent residence, political affiliation, categories of undergraduate major, and race which was an optional question. All questions except race and residency are multiple choice, while these final two were open ended. While the relevance of the demographics of the Tufts population is summarized in the previous table, the summary statistics for all of the variables are shown in a table in the appendix. Categorical variables that are not ordinal are described in frequency tables in the appendix as well.

VI. Results

a. Purchasing from Remote Sellers and Effect of Tax on Students Purchases

Information taken from this survey can be informative in both qualitative and regression analysis. Before examining student impressions of the use tax, it is first important to consider their purchases that involve the tax. Basic information on students' purchasing habits and motivations for choosing online and remote sellers can show the relative importance of the role of sales taxes in these choices. If students were not making online, mail order, or out of state
purchases and spending noteworthy amounts on them, their opinions on the afterthoughts of these purchases, such as the use tax, would have no meaning.

First, the students prove this is not the case, as only 2% of respondents have never bought goods online or from mail order catalogs and 51% of respondents make these purchases once or twice a month. Not only are these types of purchases common, but students are also spending a great deal on these goods. In the past week, 32% of respondents say that they have spent over $100 on these purchases, and 9% have spent over $300. Extend the time period to the past year and the proportion of students spending over $100 jumps up to 94%, half of whom have spent over $300. While students are highly sought after consumers based on their purchasing power as a group, many individual students tend to work with a tight budget. This puts them amongst a group that could be strongly affected by even the small amount the addition of a use tax tacks on to their purchases, and at the level the students indicate they spend, their decisions become economically significant as they represent a large amount of lost tax revenue.

Now that we have established that students make a significant number of taxable purchases, what is it that leads them to remote sellers as opposed to buying goods from local retailers? This question is especially relevant because of the location of Tufts, an area with many retail options and easy access to Boston. Universities in rural areas with fewer local stores make ordering online or traveling elsewhere easier preferable by giving them a larger variety of goods and vendors to choose from. So whatever may be true of Tufts students may be different from that of students at colleges not situated near a city, and other factors, for example price, lack of a sales tax, or convenience, that go into buying online become more relevant. Students were asked to rate seven of these aspects of buying online on a scale from one to five, the details of which can be found in Table 2. Of these choices, the one that the largest proportion of students found to
be most important was finding lower prices online, with 65% labeling it as very important in their decision to buy online. Only 14% of students said that being charged no sales tax online was very important to their decision to buy goods online, by far the smallest positive response of all of the choices, while 40% labeled this aspect as neither important nor unimportant, by far the largest neutral response. One of the possible problems with these numbers is that students are actually mistaking the lack of sales tax for lower prices, which will be an issue when considering the results from regression analysis.

This has very strong implications about enforcement of the use tax and the effect that stronger enforcement may have on online shopping. As described in the literature review, many economists believe charging a sales tax may cause a drastic decline in online sales. These results seemingly contrast the outcome from Goolsbee’s study which approximated that applying a sales tax to online goods could reduce the number of online buyers by as much as 24% (Goolsbee, 1999).

However, when asked later in the survey, 36% of the respondents said they would not continue to buy as much online if they were to start seeing sales taxed charged directly to their internet purchases. This may not mean that they would stop buying goods online completely, but it shows that students will notice. While students do not claim to buy online because of the lack

<table>
<thead>
<tr>
<th>Reason for buying online</th>
<th>5 - Very important</th>
<th>4 - Somewhat important</th>
<th>3 - Neither important nor unimportant</th>
<th>2 - Somewhat unimportant</th>
<th>1 - Very unimportant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Prices</td>
<td>65.0%</td>
<td>23.0%</td>
<td>9.3%</td>
<td>2.2%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Ease to find items</td>
<td>52.2%</td>
<td>27.7%</td>
<td>13.2%</td>
<td>4.9%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Finding items not available in stores</td>
<td>51.1%</td>
<td>39.9%</td>
<td>9.2%</td>
<td>2.7%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Convenience of Delivery</td>
<td>47.0%</td>
<td>36.6%</td>
<td>11.5%</td>
<td>4.4%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Available 24 hours a day</td>
<td>42.6%</td>
<td>30.1%</td>
<td>23.3%</td>
<td>5.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>No sales tax</td>
<td>14.1%</td>
<td>28.8%</td>
<td>40.2%</td>
<td>11.4%</td>
<td>5.4%</td>
</tr>
</tbody>
</table>
of sales tax, suddenly having to face the sales tax would make them look at the subject in a different light.

A third of the sample are claiming they will spend less online if they had to start paying the extra 5% tax, but are they the third that are spending enough to make it matter? The mean answers of bigger spenders show that they will be less likely than the average of the general sample to react this way to implementing the use tax, or what the consumer just sees as the sales tax, on the internet. Of those who spend over $300 a month online, only 18% would be likely to change their buying habits based on the tax. (See Table 3) Bigger spenders seem reliant on the internet for reasons other than the sales tax, so this will not have a strong effect on their purchasing choices, and they would be where the majority of revenue would stem from. It is not only the biggest spenders who react in the way, all but the two lowest categories of spenders display different reactions than the sample means may show.

1. Taxable vs. Non Taxable Goods

Are students buying online to avoid paying a sales tax, possibly without even realizing? As just mentioned, students do not note the lack of online sales tax as being very important when deciding to buy goods online, but do find lower prices to be the most significant reason. It is possible that they are confusing the lack of sales tax with actually being a lower price than one they pay in stores, not realizing that the extra few dollars is due to the sales tax. However, students also purchase items online on which no taxes are due either in cyberspace or a merchant
down the street, such as airline tickets and clothing. It could, however, indicate that taxes are important if students are buying more of items like books, which are taxable, but not of items like airline tickets, which are exempt. In addition, there may be certain aspects that lead to the buying of certain goods, and these may be more sensitive to the extra price incentive by buying online. I then ran a probit regression based off of Goolsbee’s model, with whether or not the student bought the good as the dependent variable, and then how they rate the importance of different aspects of online buying as a number of the independent variables. The two goods I am working with are textbooks as the example of a taxable item and travel tickets as the non taxable item. These are the two most popular of their respective taxable and non taxable goods categories. Also included in the regression are variables for frequency of buying goods online, age, and income level, along with dummy variables for gender, categories of the students’ majors and political affiliations, all which may also influence their decision in buying a certain goods and their reasons for buying these online.

The results comparing these two items, as can be seen from Table 4, do not show that the importance of any of these online buying properties have any significant relationship with buying textbooks online; however, the desire for lower prices online is significant in the purchase of travel tickets. Here the importance of lower prices has a small negative marginal effect on an individuals’ choice to buy travel tickets online, meaning that for this type of good that has no tax, those who do not rank low price as highly as others will choose to buy it. The reverse of this might then be expected that there be a positive marginal effect in the case of textbooks or the otherwise taxable goods, however, while the marginal effect is positive, there is not a significant relationship in this regression, which contained the same dependent variables in
both cases. There is the chance this relationship with the travel tickets is somewhat coincidental.

because such a high percentage of the population buys travel tickets in addition to other taxable goods. As neither of these shows very convincingly that there is a strong effect by low prices or lack of sales tax on purchasing either the taxable or exempt goods, this leads to the conclusion that to the student consumer there is seemingly no difference between the two.

<table>
<thead>
<tr>
<th>TABLE 4</th>
<th>BUYING ONLINE - TAXABLE vs. NON TAXABLE ITEMS</th>
<th>PROBIT REGRESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>BUYING GOOD (YES/NO) AS DEPENDENT VARIABLE</strong></td>
<td><strong>PROBIT REGRESSION</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TESTBOOKS</strong></td>
<td><strong>TRAVEL TICKETS</strong></td>
</tr>
<tr>
<td><strong>VARIABLE</strong></td>
<td><strong>COEFFICIENT (ST. ER.)</strong></td>
<td><strong>MARGINAL EFFECTS</strong> (ST. ER.)</td>
</tr>
<tr>
<td>CONVENIENCE OF HAVING ITEMS DELIVERED</td>
<td>0.063 (0.027)</td>
<td>0.067 (0.025)</td>
</tr>
<tr>
<td>FINDING ITEMS NOT AVAILABLE IN STORES</td>
<td>-0.046 (0.053)</td>
<td>-0.111 (0.096)</td>
</tr>
<tr>
<td>NO SALES TAX</td>
<td>-0.009 (0.214)</td>
<td>0.099 (0.096)</td>
</tr>
<tr>
<td>LOWER PRICES</td>
<td>0.044 (0.156)</td>
<td>-0.401 (0.207)</td>
</tr>
<tr>
<td>EASIER TO PAY ITEMS</td>
<td>-0.159 (0.152)</td>
<td>0.212 (0.055)</td>
</tr>
<tr>
<td>AVAILABLE 24 HOURS A DAY</td>
<td>0.089 (0.124)</td>
<td>-0.143 (0.048)</td>
</tr>
<tr>
<td>FREQUENCY OF BUYING GOODS ONLINE</td>
<td>0.13 (0.106)</td>
<td>0.132 (0.027)</td>
</tr>
<tr>
<td>GENDER</td>
<td>0.112 (0.130)</td>
<td>-0.102 (0.089)</td>
</tr>
<tr>
<td>AGE</td>
<td>0.042 (0.038)</td>
<td>-0.078 (0.038)</td>
</tr>
<tr>
<td>EDUCATION LEVEL</td>
<td>-0.048 (0.157)</td>
<td>0.100 (0.017)</td>
</tr>
<tr>
<td>INDEPENDENT PARTY DUMMY</td>
<td>0.088 (0.080)</td>
<td>0.085 (0.087)</td>
</tr>
<tr>
<td>DEMOCRATIC PARTY DUMMY</td>
<td>0.121 (0.277)</td>
<td>0.117 (0.107)</td>
</tr>
<tr>
<td>REPUBLICAN PARTY DUMMY</td>
<td>0.053 (0.375)</td>
<td>0.057 (0.071)</td>
</tr>
<tr>
<td>ENGINEERING MAJOR DUMMY</td>
<td>0.085 (0.491)</td>
<td>-0.012 (0.030)</td>
</tr>
<tr>
<td>ARTS &amp; HUMANITIES MAJOR DUMMY</td>
<td>0.046 (0.491)</td>
<td>-0.497 (0.113)</td>
</tr>
<tr>
<td>NATURAL SCIENCES MAJOR DUMMY</td>
<td>0.903 (0.475)</td>
<td>0.363 (0.131)</td>
</tr>
<tr>
<td>SOCIAL SCIENCES MAJOR DUMMY</td>
<td>0.879 (0.437)</td>
<td>-0.220 (0.150)</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.145 (1.646)</td>
<td>0.061 (0.103)</td>
</tr>
</tbody>
</table>

n=176

p<0.05

p<0.001

(1) To avoid problems with collinearity, undecided major and other political affiliation were kept out of the regression.
To reinforce this, none of the other online conveniences were significant in the case of either good, so what exactly is important when purchasing these goods online? There seems to be no strong difference between taxable and non-taxable goods, and no other overwhelming factor. The best conclusion that can be made out of this is that they are buying these goods online because students are all ready online for other reasons. Even though the fact that it is available 24 hours a day did not prove to be a significant, it goes beyond the fact that it is accessible to the student any time he wants, but instead that he is on the computer for other reasons. So why not book your trip home while you have nothing else to do and are just checking your email, or buy your textbooks for the year while your class schedule is sitting on your computer screen; it just makes sense. Despite the 34% who said that they would buy less online if the use tax were to be implemented online, these results indicate that these few additional dollars would not have a strong effect on taxable items.

Other significant relationships are gender and frequency of buying goods online, and in the case of textbooks also the academic major dummies. The frequency of buying goods online has an understandably positive marginal effect on buying both of these goods online, as those that buy more online would also buy more textbooks and travel tickets, which are the two most popular purchases of this type. The positive marginal effect of gender in the case of textbooks, in contrast to the negative effect in the case of travel tickets, basically means that surveyed females tend to buy textbooks more online and males buy more travel tickets, not necessarily that females look to save money by buying non-taxable goods more so than males, just that this seems to be certain items that they prefer to purchase by these methods.

The significance of the academic dummy variables is present in the textbook regression and not in the travel tickets regression can be explained by the nature and purpose of buying
textbooks online. A students' major dictates the amount, and often cost as well, of textbooks he
will need to buy for the semester. Humanities majors, classes that usually require a large amount
of reading and as such many books for each class, thus have the largest marginal effect. In
contrast, engineering majors usually have one or two large textbooks for their class, so they have
fewer items to buy, which may be one reason why they have the smallest marginal effect of all of
the academic areas. It is the fact that these factors are significant while the price aspect is not that
is also interesting, implying that students buy these textbooks online, which are a basic needs for
school every semester, and do not necessarily do so because of lower prices, even though going
to the book store on campus would get them their books faster. Instead these price effects are
shown through these variables by the amount and possible cost of books that need to be
purchased. The individuals who are facing the highest textbook expenses are the ones who look
to buy textbooks online the most in order to reduce their costs as much as possible.

In retrospect it would have been helpful to just come out and ask if students looked for
lower priced textbook online because this is definitely a common practice. These results
nevertheless indicate that students would not be strongly affected by an implementation of sales
tax on online goods, or similarly, expanding enforcement of the use tax, when buying goods
online that are ultimately subject to the use tax.

b. Knowledge and Opinion of Sales and Use Taxes

Another interesting aspect of students' behavior regarding the sales tax is their general
lack of knowledge on the subject. They are not expected to be public finance experts, but many
students pay this on a daily basis. The respondents were asked if they knew the Massachusetts
sales tax rate, and 82% answered that they did, however, only 59% of them correctly stated the
correct rate of 5%. The mean answer for those claiming to know was 4.69%, while only slightly off of the correct answer of 5% nevertheless shows there to be a prevalent lack of knowledge of the amount they might pay daily to the state of Massachusetts. Another response that raises questions about students’ knowledge of tax being that only 54% of students said that they have paid the state sales tax on any goods in the past week, and another 23% that they were not sure if they had. That would have to mean that the remaining 23% have not gone out to eat, or purchased something from a convenience store, bookstore, etc. over the past week. While it is possible, it does not seem probable with these places being frequent stops for a college student through a given week. Is this still a question of students being charged this tax and they do not realize it, or that they have become so accustomed to being charged this extra amount that they basically ignore it as a factor in the transaction and look only to their owed total? While there is no real answer, it begs the question, would they notice if they were being charged the tax from online or out of state goods if they do not even realize when they are paying it in the state? In addition, of those who knew they had paid the sales tax on an item, only three quarters of them could correctly identify the state sales tax rate. This is more of a question about general knowledge rather than student thoughts on the tax, and does not mean it will necessarily have an effect on their compliance decisions regarding the use tax. Hopefully, this first section of the survey helped to educate them on sales and use tax laws and may actually make them more aware of when they are being charged the tax in the future.

As expected, the number of students who knew of the use tax was very low; however there were a surprising few who had heard of the tax and claim to have paid it in the past year. If this is the case, they have probably done so on the purchase or registration of a car in the state, because having to register the car with the state makes enforcement of the tax notably easier. An
appropriate question that could have been included after asking if they had complied could have been about the details of this purchase. I may be unfair in assuming that this is the only way they would comply, and it is possible they have paid the tax for other goods, but these make up the most common cases of tax compliance. Of the 9% of respondents who had previously heard of the use tax, about a third of them did say that they had paid the tax in the past year, and when asked why all gave the reason that they did so because it is the law, as opposed to wanting to avoid a fine. While this section of the sample is minute, it shows some promise that students may not be willing to risk breaking the law in order to save a few dollars.

For the other 90% of students who have never heard of the tax, they should realize that just learning about the tax does not really affect their current chances of being caught for not paying. These students, along with the general population of every state with a sales tax, have never been fined for evasion or needed to pay the tax before, so why should simply learning about the tax make them decide to start paying? If they are rational, then it should not. One of the basic issues of good tax compliance, for all vendors and individuals, is everyone can get away with saying they should not have to collect/pay when no one else does. This translates into the current risk for evasion being close to zero for the time being, but what if that situation was to change? If there were to be some way to create a certain level of enforcement, or create the appearance of this level of enforcement, this could affect a decision to comply by creating the appearance of a more risky situation. This is exactly what will be examined in the analysis, but before this there are other basic aspects of the data that should be considered.

There are many circumstances, outside of tax issues, in which people voluntarily give money to worthy causes or to the state funded programs where they believe money is needed. If people know that a program that they believe in needs money this makes them more willing to
give money. This is usually the not case with taxes because most people believe that they are overcharged by the government as is, but they may also have common misconceptions about where their money actually goes. The majority of the general population, and arguable the majority of students, do not know how state budgets are allocated or just how important taxes are to the state revenue and budget. State sales taxes account for anywhere between 30% of 40% of state and local tax revenue (Cornia 2000), and approximately 18% of total state revenue, a number that might surprise many adults as well as students. It was in fact surprising to these students, 28% of whom believe that the state sales tax account for more than a quarter of total state revenue. While this may mean nothing except that students, understandably, do not realize the intricacies of state budget matters, but it may also influence their feelings towards sales and use taxes. If they believe this tax revenue to be less, or more, important than it actually is, this may contribute to a more negative reaction to the tax. This will be explored further in regression analysis.

c. Attitudes Towards the Use Tax

One of the main questions presented in this study is that of student attitudes towards the tax after having learned of it, and while the results from the survey are somewhat surprising, they also leave space for further questioning. For those students who had not heard of the tax, they were asked straightforwardly if they would comply having now learned of the law. Reasonably, as discussed earlier, just hearing or learning about the tax should not necessarily make them suddenly decide that they should begin paying it, unless they have a drastically risk averse personality. The object of the survey was to obtain student opinions on the tax, not necessarily to
force or convince them to comply with the tax. However, students may not have necessarily seen
the survey in this way and misinterpreted this as being my goal.

A whopping 36% of respondents said that they would comply with the tax in the future, with no other additions in fine or enforcement. These people seem to be suffering from the
"pathological honesty" that Shenrod (Shenrod 1998)14 spoke of on the idea of voluntary
compliance of any tax. This, however, seems to even go beyond pathological honesty. While it is
each state's ideal future situation to see higher compliance rates, there has to be some type of
enforcement method in place. Right now there is no enforcement device, and while the student is
not told this in the survey directly as that would be leading them to certain answers, at no point
does it mention any actual chance of audit or set fine rate. So does this result mean that 36% of
these students will contact the DOR and file their use tax payments? In my opinion the answer
would be: almost definitely not. When asked why they answered affirmatively, a common
response was "It is the law" and "I don't commonly break the law." This can be taken to mean
that they are very risk averse and that they would choose to pay given a situation where it was
commonly seen as "unlawful" to not pay, but currently there is no political group or other sector
that has publicly stressed this issue. These respondents may have been under the impression that
responding that they will not comply may indicate that they are "law breakers," or that I might
somehow report their answer to a higher authority, despite the fact that the email with the survey
stressed the fact that the survey response would in no way be traced back to an individual. The
question stated in the survey as "Now that you have learned about the use tax, will you comply
on future purchases when you know the tax is due?" may have led them to believe this even
though I made an attempt not to lead them into answering yes just to show that they are a perfect

14 Refers to discussion of Shenrod's "On Voluntary Compliance, Voluntary Taxes, and Social Capital" in the
literature review section.
law abiding citizen. It may have been more helpful to add "at the current enforcement level," or something to indicate that the situation I am referring to is no different than if they had tried to buy textbooks on amazon.com before checking their email and taking the survey. In addition, this question came after those that asked about enforcement levels that would need to be present in order for the students to decide to comply. The ordering of the questions may have thrown off the respondent and caused some confusion about what this more basic yes or no question was really asking.

The remaining 64% of respondents answered that they will not comply after learning about that tax. This is more of a rational decision given the current enforcement level, and the majority of students noted this in their explanation for their answer. If they know that they will not be caught there is no reason to pay, and why should they go out of their way just to give more money to the government. However, only 11% of this group indicated that they disagreed with the law. Respondents were given the chance to reply in their own words, so they were not limited to one explanation or one answer. While this does not mean that the unquestionably approve of the law, it does show that it is not necessarily the tax itself, but instead just the lack of significant enforcement, that keeps them from paying.

Another common attitude towards the tax and compliance, acknowledged by about 20% of non compliers, is that the process of having to pay is too complicated or too much of a hassle. As one student put it, "If the forms are given to me maybe, but if not who cares?" In today's society, not only in the case of college students, due to recent and frequent technological advancements, everything is expected to be done quickly and easily. As services of all types become increasingly available online, many people have been spoiled in the sense that tasks that may have taken a large amount of time only months ago can now be done with several clicks of a
mouse or key strokes. Online shopping is just one example of this, but there is also online banking, investing, applications for jobs and schools, and html versions of books and textbooks, only to name a few of an infinite number of services. However, in the case of college students who are extremely reliant on the internet, the need for ease and convenience is extremely high. Students rely heavily on email for communication with other students and professors and constantly use instant messenger to talk to other students in lieu of having to even pick up a phone. Tufts students also can register for classes, obtain their grades and transcripts, search course catalogs, pay bills, and even take classes online. This saves them the hassle of having to wait on long lines, make trips to the library, or even having to physically go to classes. These can all now be done one their own time in a matter of minutes, and puts many students into the mentality that just about anything can be done online or with a minimal amount of annoyance and effort. While this may make it seem like students are spoiled, and even if they are, the fact of the matter is they are not as willing to deal with having to go out of their way to do something as previous generations may have been. There is nothing in the survey or in the data to measure this, but this would be another interesting aspect to look into.

While there is some question behind those that answered affirmatively to this question, the information does say something about the students’ attitude towards the tax in general. While they may not go out of their way to comply with the tax, it shows that they have a basic knowledge that it is their obligation to pay it and are willing to do so. It is improbable that simply learning about the tax will create compliance, but it is the attitude towards the tax that may increase chances of compliance in the future along with greater enforcement. In that sense these respondents can be seen as those who see the tax more favorably than the other group.

1. Attitudes towards the tax based on possible compliance influences
The survey questions suggested several situations that might influence or affect a compliance decision and, as described in the data section, the probability that a given scenario will have an affect on the compliance decision, and are divided into these categories, VERY LIKELY, SOMewhat LIKELY, and NOT LIKELY. The first asked whether knowing someone who had previously been fined for compliance would have an effect. Interestingly enough, there were a few people who did list this exact reason in the open-ended answer when responding why they chose not to comply. While only about a third of the respondents answered that this would be very likely to affect their compliance, there was still a much larger positive response than negative.

They are around people their own age with similar interests and attitudes twenty four hours a day, and in an environment like this people are inevitably going to hear about the experiences of others, and take this and learn from them. If one person were to somehow be fined for non-compliance, this person would tell another person, who would in turn tell five more people, and sooner or later everyone knows that this would be something they have to watch out for.

Taking the example of file sharing and downloading media from the internet, students see that there is a risk in continuing to do so, and that students around the country are being subpoenaed for violating copyright laws, yet still it is a common practice. However, not all students have continued to download after seeing students around the country held liable for the actions, but have also reacted to seeing other Tufts students held accountable and punished for it. As an article in the Tufts newspaper, the Tufts Daily, in February of 2004 indicates, the university received 400 complaints, however no subpoenas, from the Recording Industry Association of America (RIAA) in the spring of 2003 about student downloading, and the individuals in question are sent a warning by the university. The student’s internet access is taken
away until he removes the violating program, and if he does not do so then he is sent to the dean with the possibility of facing suspension or expulsion. These complaints were sent out starting the spring of 2003, and by the end of the following fall semester, file sharing on the Tufts network had decreased 50% from the 2002-2003 academic year.\textsuperscript{14}

One of the issues that leads to the current low compliance rate, and that was discussed earlier, is the fact that a very low percentage of the population actually knows about the tax. While vendors choose not to collect the tax voluntarily in order to offer the lowest possible price to their customers, what if they were to simply remind the consumer of their obligation to pay the tax? While states' attempts to offer incentives to vendors to do so has basically failed, what if they were to instead work out a deal with vendors to include a notice about the tax with the purchases. Vendors may still need some kind of payoff in order to pass this off to the consumer; at least this would increase knowledge of the tax and could potentially create stronger compliance. I am not suggesting that this should be done or is an appropriate action to take, just that it is one worth investigating, and I do so by listing it among these scenarios. However, only 26.2% of students say that this would be very likely to influence their decision to comply. While regression analysis will look into the significance of this situation, the generally neutral response relates to the basic principle that merely knowing that the tax exists will not automatically make even the most "law abiding" student comply. A better version of this question should have asked not if a form reminding of them of the tax had been included with the purchase, but if the form itself were included would that instead make a difference in compliance.

Another possible influence on the compliance decision, which is just a manifestation of the convenience factor expressed in the open ended question, is making the filing process easier.

\textsuperscript{14} Information taken from the daily article described. "File Sharing Crackdown Continues." Tufts Daily 02/03/2004 - available at http://tudaily.daily.tufts.edu/articleDisplay.jsp?x_id=1020.
More than a third of respondents would be more likely to comply if this were to happen, which is a strong indication that somehow making the filing process more convenient would make it easier and thus become more of an option for students. If students could just be told how to do it and be able to do so without significantly going out of their way, this would make it more likely that they would comply.

For speaking of the final issue I would like to revisit the example of file sharing and downloading on the Tufts campus. Part of the effort to increase compliance with this law on campus involved faculty and administrative members taking out full page ads in the Daily stressing the issue. In addition, this topic became a subject for national debate and discussion, with politicians speaking about the issue in various forms of the media, stressing to students that it truly was an issue worthy of their attention and action. When it comes to the use tax, which is in fact a national issue because of the intense debate on the question of taxing the internet, not many politicians may be willing to come out and take a stand to start enforcing the tax as all that says to constituents is the government is trying to take more of their hard earned money. However, if they were to just let the public know about the tax or advocate further knowledge of it that may increase compliance somewhat. This suggestion received the strongest response from students, with 37.7% saying it would strongly affect their compliance decision if advocating the tax became a statewide issue or if it were to put into effect some type of knowledge increasing campaign.

2. Regression analysis - Decision to comply based on attitudes towards the use tax

Why would over a third of students say that they would comply with the tax now that they have just heard of it? This aspect is in fact telling about their attitude towards the tax. Of those
that said they would comply, none mentioned that they did not agree with the tax. While it is hard to have a “positive attitude” or feelings towards a tax or something that you would have to spend extra money on, the fact that they indicated they would comply implies that they have at least at the least a neutral view of the tax with a willingness to comply.

Despite my feeling that students will not actually go out and pay the tax, I feel that the answer to this question is still very important for those reasons, and thus used it in a similar type of probit regression, including students’ reactions to the options for possible enforcement and methods as explanatory variables in order to look for the aspects that are more important than others in the compliance decision. The income level is also included to see if the family income is in actually a factor in student’s compliance decisions. Dummies for gender, academic major, and political affiliation are also included. (See Table 5 for results)

| Table 5: Compliance Decision Choice to Comply (Yes/No) Dependent Variable - Probit |
|---------------------------------------------|-----------------|----------|
| Variable Definition                        | Coefficient (SE) | p-value  |
| KNOWING SOMEONE PREVIOUSLY FINE AFFECTING COMPLIANCE | 0.632 (0.245)   | 0.009    |
| RECEIVING A NOTICE WITH GOODS AFFECTING COMPLIANCE | -0.262 (0.051)  | 0.315    |
| HAVING AN ONLINE POP-UP AFTERMAKING A PLANNING AFFECTING COMPLIANCE | 0.306 (0.291)   | 0.224    |
| EASIER FILING PROCESS AFFECTING COMPLIANCE | 0.867 (0.264)   | 0.002    |
| BECOMING A POLITICAL ISSUE AFFECTING COMPLIANCE | -0.225 (0.251)  | 0.249    |
| SUPPORT SIMPLIFYING TAX LAWS | 0.160 (0.153)  | 0.024    |
| GENDER* | 0.645 (0.322) | 0.002    |
| INDICATED RISK LEVEL | 1.133 (0.130)  | 0.007    |
| INCOME LEVEL | -0.088 (0.064) | 0.007    |
| PERCEPTION OF IMPACT OF SALE TAX | 0.14 (0.157)  | 0.027    |
| INDEPENDENT PARTY DUMMY* | -0.14 (0.304)  | 0.684    |
| DEMOCRATIC PARTY DUMMY* | -0.12 (0.304)  | 0.646    |
| REPUBLICAN PARTY DUMMY* | -0.75 (0.305)  | 0.010    |
| ENGLISH MAJOR DUMMY* | -0.975 (0.653)  | 0.019    |
| ARTS & HUMANITIES MAJOR DUMMY* | -0.397 (0.988) | 0.010    |
| NATURAL SCIENCES MAJOR DUMMY* | -0.373 (0.967) | 0.015    |
| SOCIAL SCIENCE MAJOR DUMMY* | -0.168 (0.967) | 0.010    |
| CIVIC* | -0.82 (0.746)  | 0.007    |

(*) Dummies for discrete change dummy variable from 0 to 1. Highlighted values are significant at 5% significance level based on p statistic.
It is interesting that two of the most important outside factors, and as this regression shows two of the few aspects significant in the compliance decision, are having known someone who has previously been fined, and also creating an easier filing process. It is these outside influences, as opposed to direct reminders, that have a positive effect on students' decisions. These marginal effects are both positive and significant, indicating that an increase in the likelihood these aspects affect a student's decision, induces an actual increase in his current decision to comply which directly involves the aforementioned attitudes.

It is interesting that students would be so affected by just having known someone else who may have been fined, or at least that they believe they would be affected if this were to happen. Having basically seen enforcement in action, it may increase the uncertain level of \( p \), the probability that they will be fined, in their mind, while in fact the actual \( p \) may not have changed at all. Again reverting back to the case of file sharing on campus, which has been a legal issue for several years but only now has there been a significant change in the behavior of the Tufts student population. Up until the time that Tufts began cracking down on piracy, students seemed to have just had the mentality, "Everyone else is doing it so why shouldn't I?" After they might find out that the student down the hall was just put on probation for using Kazaa, this attitude changes and now anyone can be next. Hearing about it happening at other schools does not hit home as much as when it happens to someone you know or hear the story from. If efforts for enforcing the use tax were to increase, this could be an important factor in the case of students. The enforcement level may not have to be extremely high, but being able to fine some people may have a sort of ripple effect that artificially inflates \( p \) in the minds, and thus into the attitudes and decisions, of individuals.
A study regarding effects of imposing fines on violators of pollution laws for paper companies illustrated similar results (Shimshak, 2004). In this statistical approach, it was found that a fine levied on one of these companies for breaking pollution laws actually had a strong effect on other companies in the industry who had heard about this fine. Violation rates were reduced by about two thirds due to this “reputation effect,” as it is referred to in this case. The firms that made these changes based on what they have seen and not on having been fined reduced their emissions by the same amount as those that were. This again shows that simply creating small levels of enforcement can have a sizeable effect on overall compliance, and not only in the case of taxes but for many compliance questions.

It is also worthy of note that the other significant factor is a measure of convenience. Students indicated in their open ended responses to the compliance question that they do not know how to file or that it is too much of a hassle. While this may not mean that simply making an easier filing process would make compliance skyrocket, it would certainly give students, and presumably other parts of the population, more of a reason to do so. Making filing electronic seems like the most logical and appropriate way, even though this was not a question on the survey, it makes sense due to the nature of most of the transactions.

Students’ perception of the sales tax importance did prove to be significant, as about 72% of students did estimate the proper range for the percentage of state revenue that comes from the sales tax. In Slemrod’s paper on voluntary tax compliance, he discussed individuals’ willingness to pay based on a civic duty to the state. If it were to hold in this case then the more important one felt the sales tax was to the state the more likely they would be to comply. However, in this case the marginal effect came out to be negative, meaning that the more students believe the state relies on the tax the less likely they are to comply. Considering the question itself, it may not
have contained enough information to allow students to make an informed choice. Another question could have been added afterward, explaining the actual amount, and then asking if this would affect their previous decisions had they known the level of the tax's importance.

Again, gender proves to be a significant factor, in that being female makes one more willing to comply with the tax. Females may be generally more inclined to not want to break the law, or engage in some type of activity they believe to be unlawful or where they might be caught doing so. This will also be looked at in analysis of gender and risk preference, which is related to this approach to compliance.

One aspect that was not significant is the level of the respondent's family income. Income in this case is different than in analysis of income tax evasion or other compliance decisions, because it is not students' own personal income, but that of their household. While an adult's decisions are often based on their own take-home income, a student's "income" may consist of whatever money he works for during the school year or summers, while his parents may also give him money for expenses, rent, or other activities. It is reasonable that family level of income may still have an influence because a student coming from a wealthy household may have more money to spend and make his decisions based on this, and vice versa. However, all students have different types of cash flows and other attitudes that may not mirror their parents', with whom they are automatically grouped in the same income category. In this case I am led to believe that family income does not have an effect on their outside compliance decisions, and a more appropriate measure in this case might have been one of student's extra spending money or how much they consider their "budget" to consist of for a given semester.

d. Risk
One of the first assumptions that I made was that a student’s risk level, either self-defined or implied by his answers, would factor into his compliance choices. However, according to the previous regression, a student’s self-defined tolerance for risk does not impact his attitude or his decision to comply after immediately having learned of the tax. According to the following results, it is also not implicit in other related compliance or fiscal decisions involving varying levels of uncertainty.

If you will remember two of the factors of the tax evasion model, an approximate level of detection, or \( p \), associated with a given fine amount, should compel any individual to pay the tax. To incorporate the actual \( p \) into a model would be meaningless as it stands around zero for most everyday applicable transactions, not including easily tracked purchases such as cars and boats the need to be registered with the state. There is an understandable amount of risk involved, assuming that the more one is able to tolerate risk the higher the level of \( p \) needed to create compliance.

Before examining this relationship, it is first important to note that students’ reactions to changes in fines did respond according to the theory and reasoning that compliance should increase with increased fine. As the rate of fine presented to the respondent increased, the associated probability of detection necessary for compliance decreased and vice versa. In this case, the rate of compliance is represented in such a way that lower responses indicate a higher compliance rate, i.e. the lower the necessary rate of enforcement they more likely they are to comply. Other empirical studies generally use other measures to implicate compliance which would create a positive relationship and related elasticity, but it is because of the nature of the response that the sign in this case is negative, but still implies the same relationship. The survey presented the student with three different fine rates, 5%, 15%, and 30%, and then asked the level
of enforcement necessary to make them comply when facing those rates. Table 6 consists of measures of two elasticities, using the sample mean, were measured around the midpoint of 15% fine, measuring the percentage change in reaction for significantly higher and lower fines.

While these do not show that students make a rational decision in both cases, becoming more willing to comply when fines are increased and less willing to comply when fines are decreased, the numbers indicate that students' reactions are inelastic and not very sensitive to changes in fine rate. Other theoretical and empirical studies on compliance suggest this very relationship; that people do base compliance decisions on fines, but in a limited manner.

A previous experiment involving college students, where students were actually given a certain "secret" amount of money that only they knew of, and then asked to report their earnings faced with an uncertain chance that they would "audited," showed similar low elasticities, only .17, but the same directional relationship between fines and audit rates (Alm, Jackson, McKee 1992).16

Since the students indicate they are making rational decisions based on fine rates, I have tried to use this given probability as another way of measuring the students' risk when it comes to the subject of the use tax. The higher the probability they list in a given situation the more they are willing to risk that they will not be caught and fined. Using this as a measure of risk, I wanted to see if there were any outside influences that affected this choice and if one's self perceived risk level may affect this choice. I then used this as a dependent variable in a standard OLS regression using this risk level as an independent variable and using other previously examined

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<td><strong>FINE/PROBABILITY OF DETECTION ELASTICITY</strong></td>
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<td>Fine rate (compared to mean of answers for 15% fine)</td>
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16 In this paper the Am, Jackson, and McKee note three other studies that showed similar results.
independent variables of gender, age, and level of income, as well as dummies for major and political party affiliation.

I also included a variable for student's yearly spending online to examine the relationship between the amount spent online and the risk they are willing to take in compliance, because hypothetically the more spent online to more is technically being "evading," creates a risk for losing more money. Finally, I added one more indirect measure of student's risk, which is the amount it would take students to be indifferent to the coin flipping gamble. An increase in this variable should hypothetically have a negative relationship in the dependent variable, because the more money you would need not to take the gamble, the more you are willing to risk that you may lose money, while those who will take a
small amount of money are happier to have a certain amount of money rather than face the possibility of losing money. Should these people be the same ones who are more willing to pay the tax rather than face a chance, albeit a small one, that they will have to lose money in long run?

According to the regression results, as seen in Table 7 they are not. The gamble amounts and the detection rates are significantly related but the regression coefficient is actually positive. The best explanation I have for this is that the gamble question may have also been worded in a confusing manner, despite my best efforts to try and make the student understand the situation. It is possible that people may have been confused as to what their answer really meant, and not to completely disregard this data, but I am afraid that the numbers may be biased by this and not very representative of the sample opinion. For further verification that there is not a significant relationship between these two, the correlation between the two variables can be found in Table 8. Consistent with the regression results, there is surprisingly no relationship between these two answers.

A better approach to this may have been to present the game and the potential payoffs and losses, in this case a gain of $2 with one toss and loss of $1 with another toss, and then give a specific amount, such as $1 or $.75. After I could have given them three choices, either choose to take the gamble, take the money, or being indifferent between the two, and used the information this way to measure their risk level, those who would take the gamble being risk seekers, the ones who take the money being risk averse, and those who are indifferent being risk neutral. I had though

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17 In a pretest conducted before implementing the tax on the web I specifically asked if this question created any confusion because I was worried what students would make of it. And no one indicated that it needed to be changed.
about doing this instead, but opted for this other version to create more variability as I already have a lot of categorical variables in the data.

Again in this case, the role of a student’s gender proves to be significant, and the value of the coefficient shows the robustness of this effect on detection rates. This high negative estimate shows that females seem to be willing to take on substantially less risk in their decisions to comply. This is similar to the results of the previous regression showing that females are more likely to decide to comply even without these increased levels of enforcement, so it would only follow that in this case they would be willing to comply at lower levels of detection.

Another similarity in this regression to the previous ones is the lack of significance in the income variable. While previous empirical studies have shown that income is an essential factor in compliance decisions, students have not shown this same reliance on their family’s income in making their decisions. I assumed that their family’s level of income might have a similar effect as it does in the case of tax evasion, but it is still understandable why that might not be the case. Many students may work on similar budgets despite their family’s income level, because of either part or full time work, or saved money from previous jobs. It is important to realize that should this study have been conducted among adults or people who rely solely on their own income, results would most likely be notably different.

In this regression and the previous one based around the compliance decision, the students self defined risk level has being insignificant, also not what I had originally expected. I do not think it is a problem with the question itself, or may be just the students misrepresenting the perception of their own risk preference. More likely, I believe that this tax is somewhat of an anomaly when it comes to taxes in general, compared to more widely known ones such as the income tax or corporate tax, and in a way all bets are off when dealing with it. The use tax is a
concept they had only learned of for a few minutes before having to make these decisions, it may not make sense at first that there is actually such a law out there. So if the survey had been about, just to use the same example, downloading music, the answers may have been more consistent.

To further assess this chosen risk level, I tried running several ordered logit equations, regressing the rank on several demographic variables such as gender, age, income level, and again dummies for major, political affiliation, and also regional residence based on the students' home state. The only significant feature again proved to be gender, and the two were negatively related, which is to be expected after the previous results involving female respondents. So while the risk variable may not be significant in these regressions, the importance of gender in all of these decisions seems to be a unifying factor. Female students appear to be inherently risk averse and this shows in their compliance and their general ability to handle risk in other fiscal situations.

VII. Conclusion

This paper explores various factors of student attitudes, opinion, and risk tolerance, involved with the use tax and associated compliance decisions. When considering the results it is important to keep in mind that the survey sample is significantly representative of the Tufts University population. The students, when making purchases from online or other remote vendors, are not considerably affected by the lack of sales tax charged on these items, as they do not show any differences between buying goods that are and are not taxable online. This indicates that should the use tax be charged there is not likely to be a large change in student purchases.

In addition, students generally do not disagree with the tax itself, but are more prone to evasion obviously because of the low enforcement rates, but also because of the hassle that
paying becomes. I discussed students' tendency to spend a sizeable amount of time on the
internet every day, so one suggestion that should be considered is perhaps an online filing system
set up by the DOR in each state. While there is no question in the survey related to this type of
system, it would have been an interesting and informative section to include in the instrument. If
students are online making these purchases, then it would be very easy for them to file if it could
be handled in the same way as the transaction itself. This does not imply that online vendors
would have to supply the form or the link, just that a given state DOR would offer it online. If
the state could instead offer a small incentive to online retailers to put the link on their site or
include it somewhere in the purchasing process, this has the potential to substantially increase
compliance. There is also a question of finding in a way in which a link would connect the user
to the correct DOR, but there is currently software made specifically for use tax purposes that
allows companies to connect zip codes to the appropriate tax laws of that area, so the technology
is definitely feasible and available. While the question of enforcement and spreading the word
about this system stays the same, it would somewhat take care of the annoyance aspect of
compliance, and it would be left up to the DOR or state governments to let online consumers
know what they have to do.

While the idea of risk tolerance is strongly associated with compliance decisions in
theory, this did not prove to be the case for this group. However, lower risk tolerance, seen in
both decisions and in classifying one's own risk, proved to be a significant aspect of female
behavior. Apparently this risk-averse aspect of female mindset becomes significant in many of
these decisions and attitudes, and they prove to be risk averse in all of their compliance
decisions. It may even lead to somewhat illogical decisions, such as being almost too honest is
offering to comply with the use tax offered no incentive, no risk of fine, and not told of any level of enforcement.

Students were not very responsive to increases and decreases in fine rates when making their compliance choices. I believe the key lies not only on imposing fines, but also adjusting to their views in order to increase the chance they will comply voluntarily. For example, the idea of online filing in catering to the students' desire for convenience and ease. However, if there were to be an increased level of enforcement, students would be most likely to respond not necessarily on the fine rate itself, but their perceived chance that they will be caught based on what they know of their friends and people around them.

While some results were surprising, it is clear that a considerable amount can be told about a person's compliance decisions based on sex, and that all students are focused on finding low prices on the goods they want, and are looking to do so in an easy and convenient manner. While voluntary compliance with the use tax is far from a reality, there are certainly aspects of peoples' behavioral choices that can be examined that my help make it happen should states really want to take the initiative to enforce this tax on a more everyday level.
APPENDIX
<table>
<thead>
<tr>
<th>Variable Definition</th>
<th>Additional Information</th>
<th># of Observations</th>
<th>Mean</th>
<th>Std. Err.</th>
</tr>
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<td>0 Never, 1 Once or twice a year, 2 3 or 4 times a year, 3 Once or twice a week or more</td>
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<td><strong>ONLINE BUYING HABITS</strong></td>
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<td>Buy clothing online</td>
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<td>Buy sporting goods online</td>
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<td>Buy electronics online</td>
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<td>Buy furniture online</td>
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<td>Buy toys/Misc. online</td>
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<td>Buy groceries, cosmetics, or clothes online</td>
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<td>0.516</td>
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<td>Buy clothing online</td>
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<td>Buy toiletries</td>
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<td>Buy other goods online</td>
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<td>0.188</td>
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<td>Finding items not available in store</td>
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<td>184</td>
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<td>0.922</td>
</tr>
<tr>
<td>No sales tax</td>
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<td><strong>ECONOMIC/BUDGET OPINION</strong></td>
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<td>Support simplifying related laws</td>
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<td>Support national sales tax</td>
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<td>Age</td>
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<td>See frequency table for ranges and categories</td>
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<td>U.S. Citizen</td>
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<tr>
<td>Other</td>
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<td>1: least</td>
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<td>most</td>
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<td>Amount out of $1000 would invest in savings account</td>
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<td>Amount out of $1000 would invest in bonds</td>
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<td>Amount out of $1000 would invest in stocks</td>
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<td>286.978</td>
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### Frequency Tables for Non-Ordered Variables

#### Opinion on Mass Taxis Yat Rate

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<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
<tr>
<td>0 - No Opinion</td>
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<tr>
<td>1 - About Right</td>
<td>103</td>
<td>62.88</td>
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<tr>
<td>2 - Too Low</td>
<td>6</td>
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<tr>
<td>3 - Too High</td>
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<td>9.84</td>
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<tr>
<td>4 - Other</td>
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<td>1.25</td>
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<td><strong>TOTAL</strong></td>
<td><strong>183</strong></td>
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#### Majors by Category

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<thead>
<tr>
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<tr>
<td>1 - Social Sciences</td>
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<td>44.44</td>
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<tr>
<td>2 - Natural Science</td>
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<td>38.88</td>
</tr>
<tr>
<td>3 - Humanities</td>
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<td>30.56</td>
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<tr>
<td>4 - Engineering</td>
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<td>26.67</td>
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<tr>
<td>5 - Undecided</td>
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<td>10.98</td>
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#### Political Affiliation

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<th>Frequency</th>
<th>Percent</th>
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</thead>
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<td>0 - Republican</td>
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<td>1 - Democrat</td>
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<td>2 - Independent</td>
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<tr>
<td>3 - Other</td>
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<td>26.63</td>
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#### Income Level

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<th>Family Income</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - Don't Know</td>
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<td>25.41</td>
</tr>
<tr>
<td>1 - Under $30,000</td>
<td>1</td>
<td>0.55</td>
</tr>
<tr>
<td>2 - $30,000 - $75,000</td>
<td>7</td>
<td>3.87</td>
</tr>
<tr>
<td>3 - $75,000 - $100,000</td>
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<td>8.27</td>
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<tr>
<td>4 - $100,000 - $200,000</td>
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<tr>
<td>5 - $200,000 - $1,000,000</td>
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<td>18.78</td>
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<tr>
<td>6 - $1,000,000 - $2,000,000</td>
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<td>8.84</td>
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<td>7 - $2,000,000+</td>
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<td><strong>TOTAL</strong></td>
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SURVEY INSTRUMENT
Thesis Survey - WIN $75 POINTS

(Email included with link to survey sent out to students)

This survey is being conducted as part of my senior honors thesis in economics. I am asking that you please take about 10 minutes to fill out the attached survey to help collect data for this project. Thank you very much for your time and help. For the protection of each respondent in answering these questions, each survey is filled out anonymously. There will be no attempt to identify the respondent, and all measures will be taken to insure confidentiality and anonymity. Any potential identifying information (e.g., IP address on the computer form on which the survey was completed) will be stripped from the data. At the end of the survey you will be asked for your email address, and this information will be used only so that you may be eligible for the $75 points prize. Thank you again for your time and have a great semester!

1) How often do you make out-of-state, mail order, or internet purchases?
   - Never
   - Once or twice a year
   - Once or twice a month
   - Once a week or more
   - Other (please specify)

   If you selected other please specify:

2) Of these items, which have you purchased online or from mail order during the past year?

   - Clothing
   - Textbooks
   - Movies/DVDs/CDs
   - Computer hardware/software
   - Food
   - Sporting Goods
   - Electronics
   - Furniture/House Goods
   - Travel tickets/Reservations
   - Other (please specify)

   If you selected other please specify:
3) Do you travel out of state to purchase items in New Hampshire?

☐ Yes
☐ No

Next Page

(Only taken if answer to #3 is yes)

4) Which items have you purchased in New Hampshire?

☐ Clothing
☐ Textbooks
☐ Movies/DVDs/CDs
☐ Computer Hardware/Software
☐ Food
☐ Sporting Goods
☐ Electronics
☐ Furniture/House Goods
☐ Travel Tickets/Reservations
☐ Other (please specify)

If you selected other, please specify:

5) How much would you estimate that you have spent on online or mail order purchases over the past month?

☐ $0
☐ $1-$50
☐ $51-$100
☐ $101-$150
☐ $151-$200
☐ $201-$300
☐ $301+
6) How much would you estimate that you have spent on online or mail order purchases over the past year?

- $0
- $1-$50
- $51-$100
- $101-$150
- $151-$200
- $201-$300
- $301+

7) On a scale from 1 to 5 (5 being the highest), how important are each of these aspects in your decision to buy items online or through mail order?

<table>
<thead>
<tr>
<th>Convenience of having items delivered to you</th>
<th>5 - very important</th>
<th>3 - neither important or unimportant</th>
<th>1 - very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finding items not available in stores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No sales tax</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lower prices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easier to find items</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available 24 hours a day</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8) Currently you are not charged any sales tax from most vendors if you buy goods online. If there were to be a sales tax on internet purchases, would you continue to buy as much online?

- Yes
- No
9) Have you paid the Massachusetts sales tax on any item in the past week, either in the state or online?

☐ Yes
☐ No
☐ Don’t Know

10) Do you know the Massachusetts sales tax rate, if so what is it? (If not please enter 0)


11) The sales tax rate in Massachusetts is 5%. What is your opinion of the Massachusetts sales tax rate?

☐ Too high
☐ Too low
☐ About right
☐ No opinion
☐ Other (please specify)

If you selected other please specify:


12) The use tax is defined by the Massachusetts Department of Revenue as follows:

“The Massachusetts use tax is 5% of the sales price or rental charge on tangible personal property (including mail order [and internet ordered] items) on which no sales tax, or a sales tax rate less than the 5% Massachusetts rate, was paid and which are to be used, stored, or consumed in the Commonwealth by the purchaser.”

In other words, the use tax is an extension of the sales tax. While the sales tax applies to goods or services you purchase in the state, the use tax applies to any good purchased out of the Massachusetts that you use in Massachusetts.
You are required to pay the use tax if you did not pay sales tax in the other state in which you bought the item.

The tax can be paid either by noting the amount on a line on the Massachusetts income tax form, or by filing a form directly with the state.

Had you previously heard of the use tax?

☐ Yes
☐ No

(Only brought to this page if answered yes to previous question)

13) Have you paid this tax in the past year?

☐ Yes
☐ No

(Only brought to this page if answered yes to previous question)

14) Why?

☐ It is the law
☐ Risk of fine
☐ Have previously been fined for non-compliance
☐ Other (please specify)

If you selected other please specify:
(Brings you straight to this question if answered No to #13. If you answered yes to #13 and are then sent to #14 you skip straight to #16)

15) Why not?

- Easy to evade or little risk
- Disagree with the tax laws
- Disagree with politicians
- Too expensive
- Other (please specify)

If you selected other please specify:


16) You have now learned the basics of the use tax.

As with any tax, not complying involves the risk of being caught and fined for evasion. Let us say you drive to New Hampshire, a state with no sales tax, to buy a couch costing $300 to bring back to school.

The salesperson tells you at the time of your purchase that you are responsible for paying the use tax to Massachusetts, and the Massachusetts Department of Revenue (DOR) is investigating out of state purchasers who do not pay the tax, charging the 5% use tax ($15 for the $300 purchase) plus an additional 15% ($45 for the $300 purchase) penalty fee.

There is a probability you will be caught if you do not pay, it may for example be a 1 in 10 chance which is a 10% chance of being caught, or 1 in 5 which is 20%, etc.

What would have to be this chance that you would be caught and fined by the DOR that would make you decide to comply and pay the tax? %

17) In the same situation, the DOR would charge evaders the 5% use tax but only an additional 5% penalty fee.

What would have to be this chance that you would be caught and fined by the DOR that would make you decide to comply and pay the tax? %

What if the penalty was 30% ($90 for a $300 item), what would have to be this chance that you would be caught and fined in order for you to decide to comply and pay the tax? %

Next Page
18) Now that you have learned about the use tax, will you comply on future purchases when you know the tax is due?
   ☐ Yes
   ☐ No

19) Why or why not?

20) If you or someone you know was fined for not paying the tax, how likely would this be to influence your decision to comply?
   ☐ Very likely
   ☐ Somewhat likely
   ☐ Not likely

21) If a notice about the tax were to be included with your purchases, how likely would this be to influence your choice to comply?
   ☐ Very likely
   ☐ Somewhat likely
   ☐ Not likely

22) If after purchasing items online a window would remind you that you are responsible for the tax, how likely would this be to influence your decision to comply?
   ☐ Very likely
   ☐ Somewhat likely
   ☐ Not likely

23) If the filing process were made easier, how likely would this be to affect your decision to comply?
   ☐ Very likely
   ☐ Somewhat likely
   ☐ Not likely
24) If advocating compliance with this tax became a statewide issue or general awareness were to increase, how likely would this be to influence your compliance decision?

☑ Very likely
☐ Somewhat likely
☐ Not likely

25) The complicated laws involving the sales and use taxes make enforcement by the state tough and expensive. Would you support legislation that would simplify these laws?

☐ Yes
☐ No
☐ Unsure

26) Would you support a nationwide sales tax rate?

☐ Yes
☐ No
☐ Unsure

27) Massachusetts is currently facing a budget shortfall of $3 billion. Which of the following would you support in order to help solve this problem? (check all that apply)

☑ Increase income tax
☑ Increase sales tax
☑ Increase corporate tax
☑ Budget cuts for state funded programs
☑ Other (please specify)

If you selected other, please specify:

28) The Massachusetts state budget is projected to be about $23 billion next year. How much of Massachusetts' budget revenue would you think comes from sales tax revenue?

☐ less than 10%
29) You are offered a gamble that involves flipping a fair coin. If it lands on heads you win $2, and if it lands on tails you lose $1. You can also be given a certain amount of money less that $2 which involves no risk instead of taking the gamble. How much money would you have to receive for certain to be indifferent between the definite payment and taking the gamble?

30) You are offered the same gamble and now if it lands on heads you win $20, and if it lands on tails you lose $10. You can also be given a certain amount of money less that $20 which involves no risk instead of taking the gamble. How much money would you have to receive for certain to be indifferent between the definite payment and taking the gamble?

31) You are given $1000 to invest in any way, how much would you invest in each of the given options? (Amounts must total $1000)

Savings Account—Any money invested in a savings account is insured against loss. In addition, you receive interest at an annual rate of 3%. (meaning if you invest $100 you will earn $3 at the end of the year, if $1000 you will earn $30)

Stocks—For every $100 that you invest in stocks there is some chance of gaining or losing money. After one year, there is a 1% chance that your investment will become worthless, a 39% chance you will end up with $80, a 35% chance you will break even, and a 25% chance you will end up with $140.

Bonds—For every $100 that you invest in bonds there is some chance of losing your investment. After one year, there is one chance in 1000 (.1%) that your bonds will become worthless. Otherwise, you will receive interest at the rate of 7% each year. ($7 for every $100 invested)

Mutual Funds—A group of stocks managed by an outside group, if investing $100, after a year there is a 20% chance you will end up with $90, a 20% chance you will break even, a 30% chance you will end up...
32) On a scale from 1 to 5, how would you classify your ability to handle risk? 1 meaning you try and avoid risks at all costs and 5 meaning you actively seek risky situations.

- 1 - very risk averse
- 2 - somewhat risk averse
- 3 - neutral
- 4 - sometimes seek risks
- 5 - often seeks risk

33) What is your gender?
- Male
- Female

34) Under which category would you classify your major?
- Social Sciences
- Humanities & Arts
- Natural Sciences & Math
- Engineering
- Undecided

35) What is your age?

36) Are you a U.S. citizen or permanent resident?
- Yes
- No

(If answer to #36 is No than skip past these next three questions)
32) In which state is your permanent residence?

33) Are you registered to vote?
   C: Yes
   C: No

39) Under which party are you registered?
   C: Democratic
   C: Republican
   C: Independent
   C: Other (please specify)

If you selected other please specify:

40) Which country are you a citizen of?

41) Would you consider yourself politically active?
   C: Yes
   C: No
42) Please check which represents your family's total income before taxes:

- Less than $10,000
- $10,000 to $25,000
- $25,000 to $50,000
- $50,000 to $100,000
- $100,000 to $150,000
- $150,000 to $200,000
- More than $200,000
- Don't Know

43) How would you classify your race? (optional)

____________________________
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