

Pyramiding Transaction Taxes in New Mexico

A Report on the Gross Receipts Tax

from the



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NMTRI: Working to Improve New Mexico's Tax and Fiscal Policies

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ABOUT THE NEW MEXICO TAX RESEARCH INSTITUTE

One of the principal reasons for the existence of the New Mexico Tax Research Institute can be succinctly stated in the following two quotes, both from opinions delivered by the Supreme Court of United States.

"The power to tax involves the power to destroy" - *McCulloch v. Maryland*, 17 U.S. 316 (1819), Chief Justice John Marshall.

"Taxes are what we pay for civilized society" *Campañía General de Tabacos v. Collector*, 275 U.S. 87, 100 (1927), Justice Oliver Wendell Holmes, dissenting.

The New Mexico Tax Research Institute is a nonprofit, nonpartisan, member-supported organization dedicated to providing fact based principled research and analysis to the tax policy debate in New Mexico. We do not advocate any agenda for or against taxation. We seek only to study, inform and educate the public and tax policy makers concerning the pressing issues of taxation facing our state. We believe that well-versed policymakers and an active, informed citizenry are essential for effective representative government. We are organized and operate as a corporation pursuant to § 501(c)3 of the Internal Revenue Code and welcome individuals, businesses and organizations as members.

The creation of the New Mexico Tax Research Institute was recommended by the participants in a New Mexico First Town Hall Meeting held in May, 2001. We officially came into being in October, 2002. We are supported through the generosity of our members and through the gracious support of the McCune Charitable Foundation. We do not accept public funds inasmuch as we want to be able to be as objective as possible in our analyses and publications. Our members understand this and believe that professional, objective collection of data, analysis of that data and juxtaposition of information with sound principles enables the best decisions regarding tax and fiscal policies for our state.

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The Principles of Taxation

The **New Mexico Tax Research Institute** has adopted the following principles regarding taxation in our State:

- State and local taxes should be adequate to provide an appropriate level of those goods and services best provided by the public sector, such as education, public safety, law enforcement, streets and highways, and the courts.
- State and local tax policy should do the least harm to the private economy. Therefore, tax bases should be as broad as possible so that tax rates can be as low as possible in order to raise the necessary revenues.
- State and local tax policy should be fair and equitable towards individuals and businesses similarly situated. Individuals with the same income level should be taxed the same. Businesses engaged in similar commercial activities should be subject to the same level of taxation.
- State and local tax policy should not be costly to administer and should be easily understood by taxpayers so as to minimize taxpayer compliance costs.
- The state and local tax burden should be evaluated on the basis of the impact of all taxes levied on a given taxpayer, not just a single tax or tax rate.
- Deviations from established tax policy in pursuit of economic development, social or other goals should be well-reasoned and pursued only when established tax policies are not significantly undermined and the results of such deviations can subsequently be measured and evaluated.

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Executive Summary

Overview of this Report

The objective of this study is to examine pyramiding of the New Mexico Gross Receipts Tax and to estimate the extent to which it is occurring. The New Mexico Tax Research Institute undertook this study to provide context so that the appropriate action by policy makers can be made with as much knowledge and analysis as possible. We do not make a recommendation as to the findings. Although the Institute has not actually examined other states' tax systems and made a detailed comparison of the extent of pyramiding occurring there, the relevant literature makes clear that pyramiding occurs in all transaction tax systems. If needed, the Institute could undertake an examination of the degree of pyramiding occurring in other states for comparison purposes. We anticipate more research based on the questions raised by and the reaction to this study.

Pyramiding Defined

Pyramiding of taxation in state transaction taxes, like the New Mexico Gross Receipts Tax (GRT), occurs when the tax is paid by successive sellers of products and services as those products and services are sold and the subsequent seller is subject to the tax on its sales (assuming no suspension mechanism exists allowing a deduction, exclusion or exemption on the successive sales). In the process, the tax becomes part of the base for subsequent prices and final purchasers pay a greater amount of tax because prior taxes have become part of the subsequent tax base. Economists would argue that, ideally, the GRT should be applied only to final consumption and not to business inputs. This ideal state of no taxation of business inputs is not achieved completely by any state's transaction taxes today. Intuitively it seems clear that a broad tax base, which is often a very desirable policy and which we have in New Mexico, will result in greater pyramiding of tax simply because more goods and services are subject to tax.

The Pyramiding Debate

If pyramiding of tax is perceived as a problem to be solved, more tax suspension mechanisms (exemptions or deductions) become necessary. Pyramiding is seen as a problem not just by the economists who prefer a theoretically sound, adequate and efficient system, but also by businesses subject to the tax who perceive that this "tax on tax on...tax" adds to their costs, makes them less competitive and in the end causes them to lose business. The Legislature acknowledged the issue in the 2005 session in HB 410 and took what was admittedly a small step toward some amelioration of the impact of pyramiding. Note that those who perceive unmet needs in our state that could be alleviated by greater government expenditures wonder if a solution to the "problem" of pyramiding might not result in serious and significant loss of needed revenue.

Pyramiding is an Issue for Economists and Businesses Because

1. It is a tax on a tax, therefore the statutorily mandated tax base and rate become distorted for some sellers and purchasers.
2. Taxpayers are not treated equally. Sectors of the economy that make intensive use of inputs are taxed more than sectors that do not rely on similar inputs or businesses that are more vertically integrated.
3. There is a loss of transparency. Although the ultimate consumers may not be aware of the cumulative embedded tax costs, they may pay for all of the accumulated taxes through an increased price or the seller might keep the price down by cutting back on the number of or amount paid to employees or on other business inputs.
4. These three results lead to strong perception of complexity and unfairness as the tax is applied successively.

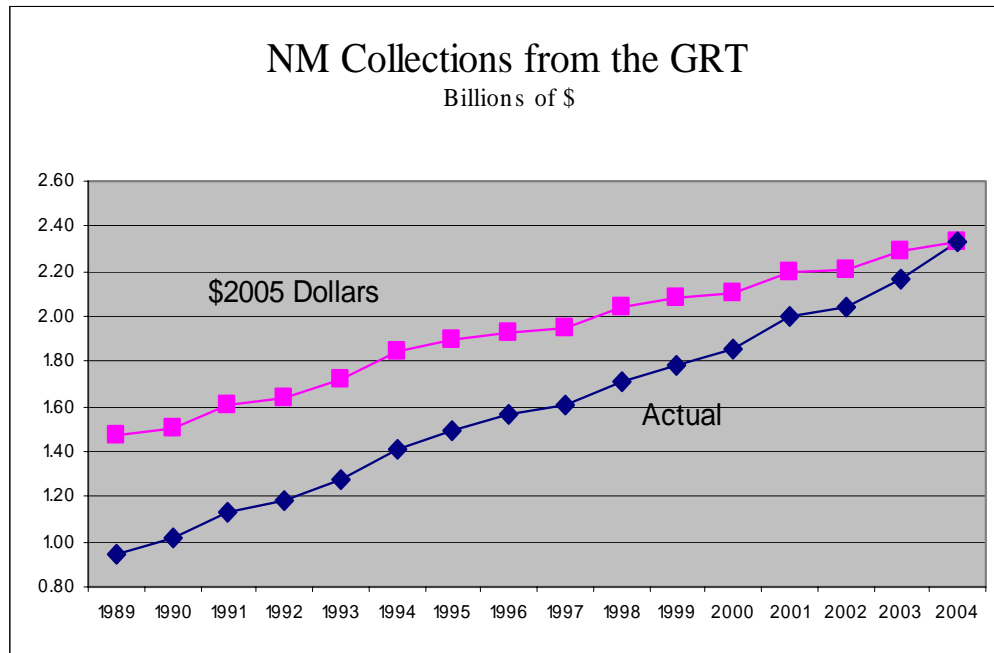
A Service Economy Complicates Matters

Sales of services are becoming a greater portion of the economy as compared with transactions involving tangible products. This trend creates issues in the efficient administration of the GRT system. Among these issues are:

1. Jurisdictional issues: The widespread use of information and communications technologies enable many services to be provided from anywhere and it becomes increasingly difficult to determine where the sale of a service takes place.
2. Difficulties in defining the inputs: In the service economy it is increasingly difficult to determine when a service becomes an input of another subsequent service.
3. Competitiveness problems: In a service economy, states compete not only with other states, but also with nations around the world. Investment today often depends on the quality and availability of the workforce, infrastructure to support business activities and lifestyle amenities. These things may be more important than the traditional need for access to natural resources or reducing the related tax bill.

Gross Receipts Taxes are a Critical Source of New Mexico State & Local Revenue

New Mexico's state and local governments are very dependent on the GRT for revenues. About 31% of the state general fund revenues comes from the GRT. About \$2.3 billion were collected in the past four quarters by state and local governments. GRT collections represent a steady and stable source of revenues for the state. Therefore, any change in the GRT system to alleviate pyramiding, depending on its comprehensiveness would have very significant fiscal impacts on the state and local governments.



Business Sector Analysis of Pyramiding

There are a few sectors that purchase a significant amount of inputs from other sectors and would therefore be more susceptible to pyramiding, if suspension mechanisms had not already been enacted to alleviate the effect of pyramiding. These sectors are Manufacturing, Mining, Wholesale and Retail, and Construction. In terms of business inputs as a percentage of Total Industrial Output, the Mining sector ranks first with about 42% of its business inputs purchased for outside sources, followed by Agriculture at 41% and Manufacturing with 36%.

The total New Mexico Gross State Product is \$55 Billion. Total purchases of business inputs in the New Mexican economy are approximately \$19.6 Billion. The State could be receiving \$1.175 billion in tax revenues from gross receipts tax on these inputs.. But provisions currently exist in the law to curtail some of this pyramiding in various sectors and these provisions are analyzed on a sector-by-sector basis.

Table A shows the effects that current New Mexico suspension mechanisms have had by sector. Overall, \$426 million in pyramiding relief has been granted under the GRT system through existing suspension mechanisms. This means that \$748 million are being collected as a result of pyramiding (1,175 – 426). There are sectors, such as Manufacturing, which despite receiving significant relief, still have significant pyramiding of taxes. In the Agricultural sector, anti-pyramiding legislation has been relatively effective. Mining, on the other hand, receives little relief. Utilities, in general, purchase few inputs from other sectors--except fuel--and the industry receives almost no pyramiding relief.

According to the results of the study, pyramiding in New Mexico represents about 32% of GRT revenues collected (\$2.3 billion). According to these figures if the existing pyramiding in NM were to be eliminated, the GRT tax rate would have to be increased by 2 percentage

points in order to maintain current levels of revenue. This calculation is done without considering the potential impact on quantity demanded due to price elasticity.

Table A also shows the steps taken to calculate the impact of pyramiding on various sectors of the New Mexico economy.

Steps in the Calculation of Pyramiding by Sector

Economic Sectors	Value of Business Purchases (1)	Potential Tax from All Business Purchases (2)	Pyramiding Relief Under Current Law (3)	Tax Collected from Pyramiding (4=2-3)	Percentage of Pyramiding "Solved" by Current GRT Law (5=3/2)
Agriculture	\$1,118.8	\$67.1	\$45.0	\$22.1	67.0%
Mining	\$2,557.5	\$153.5	\$9.1	\$144.4	5.9%
Utilities	\$445.0	\$26.7	\$0.5	\$26.2	1.9%
Construction	\$1,621.8	\$97.3	\$71.6	\$25.7	73.6%
Manufacturing	\$5,307.0	\$318.4	\$149.2	\$169.2	46.9%
Wholesale	\$536.0	\$32.2	\$2.1	\$30.2	6.5%
Retail	\$1,303.0	\$78.2	\$1.9	\$76.2	2.4%
Transportation	\$990.0	\$59.4	\$11.7	\$47.7	19.7%
Information	\$686.7	\$41.2	\$16.9	\$24.3	41.0%
Finance	\$881.4	\$52.9	\$26.7	\$26.2	50.5%
Real Estate	\$761.0	\$45.7	\$12.6	\$33.1	27.6%
Professional, Mgmt, Admin	\$1,073.3	\$64.4	\$1.0	\$63.4	1.6%
Education	\$90.4	\$5.4	\$4.4	\$1.0	81.1%
Health	\$1,294.0	\$77.6	\$51.0	\$26.6	65.7%
Arts	\$124.0	\$7.4	\$2.0	\$5.4	26.9%
Accom and Hotels	\$545.0	\$32.7	\$13.0	\$19.7	39.8%
Other Services	\$254.0	\$15.2	\$8.0	\$7.2	52.5%
Total	\$19,588.9	\$1,175.3	\$426.7	\$748.6	36.3%

Comparison of Results from Studies

Table B, below, summarizes and compares the estimate obtained in this study, vis-à-vis the results of other studies, by the Council of State Taxation (COST) (2005), by Ring (1999) and by using TRD revenue estimates. The “ceiling” is the calculation of total purchases of business inputs in the NM economy, multiplied by a typical 6% rate. The COST estimate of \$1,190 million is above the “ceiling” and it is therefore an over-estimation in our opinion. The estimate by Dr. Ray Ring of the University of North Dakota is also very high, almost reaching the “ceiling.” In our opinion, the Ring study reflects the impact of pyramiding under the GRT without recognizing the provisions existent to soften the effect of pyramiding.

The estimate of the New Mexico Tax Research Institute study and the estimate using “revenue losses” by TRD coincide to a certain extent, mainly because the same “ceiling” from the Input-Output economic model was used in both estimates.

Both the COST study and the New Mexico Tax Research Institute study use IO tables, but the COST study is national in scope and reports results for all states. NMTRI makes use of a New Mexico specific IO model, and delves in more detail into the New Mexico tax law, with the aid of experts that have had policy and tax administration experience. Ring uses a method that relies on Census and Survey Data.

Table B
Estimates of Pyramiding

Pyramiding “Ceiling” Calculated by the IO Table	\$1,175
COST Estimate of Pyramiding (2005)	\$1,190
Estimate of Pyramiding, Ring (1999)	\$1,150
Using TRD Data	\$775
Sectoral Study (NMTRI, 2005)	\$748

As noted above, unless a state’s transaction tax system exempts all business inputs or has an extremely comprehensive system of exclusions, deductions and exemptions having the same effect, pyramiding will occur. Pyramiding is not unique to New Mexico. Any state that imposes a sales-type tax will create a certain amount of Pyramiding. Hawaii, for example, has a similar tax system as New Mexico but, according to the COST study, does not pyramid as much. On the other hand, the same study reports that Louisiana, which imposes a more standard transaction tax, pyramids more than New Mexico.

The bottom line is that pyramiding **is** either a major problem requiring swift and extensive relief by the Legislature or **it is not**. It depends on your perspective. The answer probably lies, as it often does, in the middle. Selective relief may be necessary to ameliorate the negative impact that is unique to New Mexico but that relief should be applied without eviscerating the Gross Receipts Tax system that serves the state so well.

Introduction

In the past several years of tax policy discussion in New Mexico, the issue of “Pyramiding” of the Gross Receipts Tax has received significant attention. Each legislative year, the business sector proposes alternative strategies to relieve “Pyramiding” in the Gross Receipts Tax (GRT).

As will be explained below, Pyramiding occurs when the Gross Receipts Tax, levied at early stages of production is shifted forward. In the process, the tax becomes the base for subsequent price increases and final purchasers pay a greater amount than justified by the original tax rate.

We develop our estimate of Pyramiding in the New Mexico Gross Receipts Tax system in the following three sections. The first section deals with general concepts of Pyramiding, pointing out why it is an issue in New Mexico and the United States in general. This section also examines the implications of the rise in importance of the services sector in the state and national economies, and why this trend puts more pressures on the GRT system. States have generally been aware of Pyramiding and have enacted “suspension mechanisms” (exemptions and deductions) to circumvent the side-effects caused by Pyramiding.

The second section deals more specifically with the GRT in New Mexico, and how this revenue stream plays a critical role in the fiscal health of the state. It also examines the set of suspension mechanisms that has been designed to curtail Pyramiding and how those provisions currently apply in New Mexico.

The third section is an effort to quantify Pyramiding within the gross receipts tax system, using an Input Output model, reviewing the GRT law and conducting interviews with experts. The IO model provides the dollar value of business purchases of inputs by sector, therefore providing the maximum amount of Pyramiding that can occur in the New Mexican economy. Since New Mexico already has a set of suspension mechanisms designed to ameliorate pyramiding, the challenge of the quantification is to deduct the effect of these existing suspension mechanisms from the maximum, as obtained by the IO model.

The reader should not expect an exact quantification of Pyramiding in New Mexico. The numbers presented here are not accounting numbers; rather they are estimates obtained from the model, from expert opinion and from official statistics. In the quantification effort, several “unknowns” are introduced that force the use of “ranges” in the report. The last section discusses estimates made by others.

General Concepts

Definition

Sales taxes were implemented in the Depression years, when incomes decreased significantly and the property tax system had virtually collapsed. Transaction taxes, also known as consumption or sales taxes, were seen as an alternative to income and property taxes to raise revenues. At that time, the economic paradigm was uncomplicated: the tax was to be applied only to the transaction between the seller and the final consumer. For example, a farmer would harvest wheat, manufacture bread and sell it in a family outlet. The buyer would then purchase the bread and deposit the tax, probably in a jar on the counter of the farmer's store. The economy was simpler and sales were largely local. The purchase of inputs by the manufacturer/seller was not at all apparent and was not subject to tax. Since no tax was paid on inputs, the final price to the buyer did not include taxes on business inputs.

Since the Depression years, and with a more developed, complex and global economy, the purchase of business inputs has become increasingly important in many sectors of the economy, such as agriculture, manufacturing and construction. A business may pay transaction taxes¹ on the purchase of inputs and shift forward these taxes to the next production stages. The profit markup at the end of the production process may include all the transaction taxes paid in earlier stages, and the accumulation of taxes embedded in the final price ends up being higher than the statutory sales tax rate. This process is called Pyramiding in this study and is also known as "cascading."

The process is illustrated in Figure 1, where a hypothetical manufacturer purchases two inputs, and has to collect the taxes from his/her vendors. The manufacturer then incorporates the GRT paid on the inputs, on the mark-up price, and he sells the product to the final buyer.

¹ Transaction taxes include sales taxes and gross receipts taxes such as in New Mexico.,

Figure 1.
Pyramiding or Cascading

Why is Pyramiding an issue?

There are four fundamental reasons why Pyramiding is an issue worthy of discussion:

- 1) It is a tax on a tax. Taxes in an ideal world should be applied to income, profits, sales, transactions, wealth, but not to another tax. In the case of Pyramiding, when the tax is applied to the final consumer, it is also applied to the taxes that have been paid when the inputs were purchased.
- 2) The effective tax rate (ETR) becomes higher than the statutory tax rate. When a transaction tax is applied only to the transaction with the final consumer, i.e., without any pyramiding, the statutory sales tax rate and the actual tax rate paid are equal. When pyramiding occurs, the actual tax rate paid is higher than the statutory tax rate on the transaction. When businesses pay tax on tax, it results in higher costs and damages the competitiveness of NM firms. If a business is a price taker and cannot shift the pyramiding taxes onto the final consumer via price increases, then the profit of the business has to be reduced or other adjustments made, *e.g.*, cutting labor costs.
- 3) Taxpayers are not treated equally. Sectors that make more intensive use of inputs may be taxed more than sectors that do not rely on inputs, to the same extent.
- 4) There is a loss of transparency. The effects and burdens of taxes on intermediate transactions are not obvious to the final consumer. The ultimate payer of the tax is not aware of the total hidden tax costs embedded in the transaction.

Services Become More Important than Tangibles

A clear trend in state, national and world economies is that services are becoming a larger component of the world economy as compared to the manufacture and sale of tangible goods. This trend puts additional pressure on traditional sales tax systems, such as the GRT in New Mexico, because they were designed when the sale of goods was the greatest part of the economy, and creates the following problems:

- 1) Jurisdictional problems: It is increasingly difficult to determine where the sale of a service takes place. In the midst of the widespread use of information and communication technologies, a service can be provided by somebody living in a different jurisdiction and official records of the transaction might not be available to the taxing jurisdiction or even exist.
- 2) Problems in the definition of inputs: In the service economy it is increasingly difficult to determine when a service is an input of another service. In the tangible world this problem is tractable, because it is a simple matter to determine-for example-that an engine becomes an integral part of a motorized vehicle. The problem of the definition and location of inputs is highly visible in the software industry, where tasks can be and are distributed around the world, to be integrated later in a single location.
- 3) Competitiveness problems: Traditional tax incentives focused on goods-based economic growth will not be effective in a growing service economy. In a service economy, a strategy to attract investment cannot be cast in terms of access to natural resources and traditional tax incentives, but rather, in terms of access to human and intellectual capital.

Suspension Mechanisms to Curtail Pyramiding

Pyramiding is not a new phenomenon and it is not unique to New Mexico. Pyramiding or “cascading” has been discussed for decades in the context of transaction taxes, aimed at the final consumption of goods, all over the world. Almost all states in the US that have similar sales tax systems have enacted legislation to curtail Pyramiding, and have achieved that objective to varied degrees.

The Anti-Pyramiding legislation typically includes any of a great variety of statutory devices-which we label “suspension mechanisms”-enacted to reduce the taxes paid on business inputs in the production process. These suspension mechanisms are driven by two main principles:

- 1) First, suspension mechanisms are applied to inputs that become an integral part of the final product. This is a classic principle that is derived from a traditional manufacturing process. For example, the purchase of the iron or aluminum used in the manufacturing of an automobile is exempt because they become an integral part of the final product. At the present time, most states have deductions or exemptions suspending the transaction tax on these inputs, which takes care of a significant proportion of pyramiding. Another example is the use of subcontractors in the construction sectors, where electric, plumbing and heating services can be exempted from the tax.
- 2) Second, like the raw material mentioned above, suspension mechanisms are applied to products purchased completely for resale. When a product is bought and resold,

without adding any value to it, only the final transaction is usually taxed. All other transactions in the chain are suspended from the transaction tax.

These two principles drive the basic design of the suspension mechanisms of a sales tax system, but as it will be later apparent, services pose a set of challenges that were not expected when economies were based mostly on the production and sale of tangible goods.

The New Mexico Gross Receipts Tax System

General Characteristics

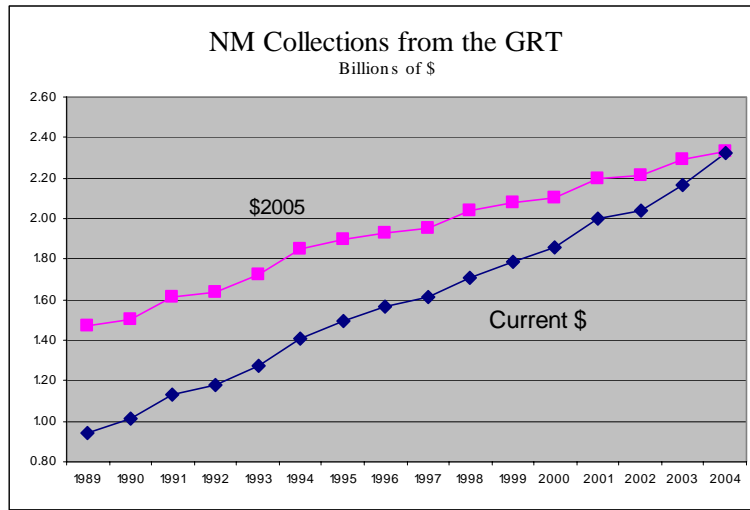
The state Gross Receipts Tax (GRT) rate in New Mexico is 5%, and local governments can impose additional local option rates. The local option makes the total GRT rates fluctuate from 5% to 7.75%. The GRT is complemented by the compensating tax, which is imposed on goods imported into New Mexico. The compensating tax is applied at a rate of 5%, without any local option portion.

New Mexico is very dependent on the GRT for state revenues. About 31% of General Fund revenues comes from the GRT, and as is shown in Figure 2, the Taxation and Revenue Department collects about \$2.3 billion in GRT revenues, which includes the state and the local option portion.

Figure 2 shows that GRT collections are not only significant in terms of absolute numbers, but they are also very stable and have steadily been increasing through time, for the period of analysis. The flow of revenues appears not to have been affected by economic downturns, probably due to its wide base and because of the presence of the flow of Federal funds into the state.

In current dollars, Figure 2 shows that GRT collections have almost tripled since 1989, from about \$800 thousand to \$2.3 billion. Even in 2005 dollars—discounting for inflation—revenue flows from GRT have increased by 60%, since 1989.

Figure 2



What is unique in the GRT system in New Mexico is that most services are included in the tax base. On one hand, since the state and national economies are moving towards services- and revenues from the production and sale of tangibles are consequently declining-experts suggest that services be included in the tax base for the states to maintain fiscal health. On the other hand, traditional sales tax systems and even the GRT system of New Mexico, are often not well equipped to deal with intangible business inputs such as services.

Another unique attribute of the GRT system in New Mexico is that the legal incidence of the tax is on the seller, as opposed to the majority of sales tax systems in the US, where the legal incidence of the tax falls on the buyer. Economic theory and Public Finance textbooks (Rosen, 2005) emphasize the fact that the economic incidence is independent from the legal incidence. Economic Incidence theory bases its analysis on the elasticities of supply and demand and pays almost no attention to the legal incidence.

In the New Mexico GRT law there are approximately 26 separate sections designed to curtail pyramiding. The list is enumerated in Table 1, with the corresponding revenue loss, as calculated by the Taxation and Revenue Department. Only 7 of them are exemptions, while 19 are deductions. The total revenue loss caused by these suspension mechanisms is approximately \$420 million, according to calculations by TRD.²

² The deduction of Property and Licenses purchased for resale (\$600) was removed from this list, because this paper only deals with Pyramiding caused by the purchases of business inputs.

**Table 1. Revenue Loss Associated with Suspension Mechanisms Designed to Curtail Pyramiding
(Millions of \$)**

Statute			Total
7-9-18	E x e m p t i o n s	Livestock & unprocessed agricultural products	\$ 3
7-9-19		Livestock services	\$ 1
7-9-30		Compensating Tax: Railroad equipment and commercial aircraft	\$ 6
7-9-33		Storing or use of oil & gas on a production unit	\$ 10
7-9-34		Storing or use of oil & gas in the oil refining business	\$ 30
7-9-36		Pipeline fuel	\$ 9
7-9-38		Compensating Tax: Electricity used in production and transmission of electricity	\$ 8
7-9-46		D e d u c t i o n s	Property for manufacturing ingredients
7-9-48	Services for resale that is subject to GRT		\$ 160
7-9-49	Property and licenses for subsequent lease		\$ 9
7-9-50	Lease of property for subsequent re-lease		\$ 3
7-9-51	Materials incorporated in construction projects subject to GRT or on tribal lands		\$ 50
7-9-52	Construction services to construction projects subject to GRT or on tribal lands		\$ 30
7-9-56.1	Internet services		\$ 8
7-9-56.2	Hosting worldwide website		\$ 3
7-9-58	Certain sales to farmers and ranchers		\$ 5
7-9-59	Certain agriculture services		\$ 1
7-9-62	50% of agricultural implements; vehicles; aircraft manufacturers		\$ 9
7-9-66.1	Real estate commissions on transactions subject to GRT		\$ 2
7-9-68	Manufacturer's warranty obligations		\$ 2
7-9-69	Certain services to an affiliated corporation		\$ 1
7-9-73	Prosthetic devices to medical practitioners		\$ 1
7-9-75	Certain services to a manufacturer		\$ 6
7-9-76.2	Leasing & licensing Theatrical tapes		\$ 5
7-9-77	50% compensating tax deduction for ag implements; vehicles; aircraft manufacturers		\$ 5
7-9-78	Compensating Tax: Property for Subsequent lease		\$ 5
			Total

Source: TRD, projections for FY2005

Business Purchases

Using an Input Output model for the New Mexican economy, the New Mexico Tax Research Institute (NMTRI) calculated that \$19.6 billion are spent yearly on business purchases in all sectors. This is about 35% of total Gross State Product. At a 6% GRT tax rate and if anti-pyramiding laws had not been enacted in New Mexico, total collections from these business inputs (pyramiding) would be approximately \$1.175 billion (see Table 2). This number represents a “ceiling” or maximum amount of tax from pyramiding, and any estimate of the actual Pyramiding should not be above \$1.175 billion, which is 52% of GRT revenues.³

Table 2 also shows the sectors that purchase a significant amount of inputs from other sectors and would be more susceptible to Pyramiding, if suspension mechanisms had not been enacted in the legislation: Manufacturing (\$318 million), Mining (\$153), Wholesale and Retail combined (\$110), and Construction (\$97). In terms of business inputs as a percentage of Total Industrial Output, the Mining sector ranks first with about 42%, followed by Agriculture (41%) and Manufacturing (36%).

Table 2.
Business Purchases by Sector
Results from the IO Model

	Business Purchases	6% GRT
Agriculture	\$1,118.80	\$67.13
Mining	\$2,557.50	\$153.45
Utilities	\$445.00	\$26.70
Construction	\$1,621.80	\$97.31
Manufacturing	\$5,307.00	\$318.42
Wholesale and Retail	\$1,839.00	\$110.34
Transportation	\$990.00	\$59.40
Information	\$686.70	\$41.20
Finance	\$881.40	\$52.88
Real Estate	\$761.00	\$45.66
Professional, Manag, Admin	\$1,073.30	\$64.40
Education	\$90.40	\$5.42
Health	\$1,294.00	\$77.64
Arts	\$124.00	\$7.44
Accom and Hotels	\$545.00	\$32.70
Other Services	\$254.00	\$15.24
Total	\$19,588.90	\$1,175.33

Source: IO Model, IMPLAN/NMTRI

³ These data were obtained from the IO model which will be discussed later in this study

Sectoral Analysis of Pyramiding

In this section an effort is made to quantify the actual Pyramiding caused by the GRT in New Mexico. The quantification is conducted with the aid of an Input/Output model developed for the state (IMPLAN, 2004). The main result—as was stated in the previous section—is the quantification of business inputs by sector, *i.e.*, the amount of purchases by a specific sector, from the rest of the sectors. The IO model provides a significant level of disaggregation (about 90 subsectors), but in this study the 16 sector model was mostly used, except when consultation with experts was conducted.

Considering that a set of Anti-Pyramiding measures (suspension mechanisms—or exemptions and deductions) are already in place in New Mexico, the effects of these measures need to be deducted from the maximum pyramiding “ceiling” provided by the Input/Output model. The challenge in this process is that, while the model provides data by sector, the suspension mechanisms are not necessarily designed by sectors.

The suspension mechanisms studied here are designed to remove business inputs from the tax base. It is assumed that all the sale for resale transactions are already suspended by current tax law. In the wholesale and retail sectors, purchases for resale are not considered a business input.

The I/O model has been previously used in the calculation of Pyramiding (Leung, et. al, 1988; Cline, et. al., 2005). The strategy of the quantification is therefore to calculate the dollar amount that each sector spends in the purchase of business inputs, apply the GRT rate, and then deduct from this amount the inputs that are suspended under current law.

The Agricultural Sector

In terms of Gross State Product, the agricultural sector in New Mexico is relatively small, \$979 million, which is 1.5% of State GSP. The sub-sectors included in this category are Crop Farming, Livestock, Forestry and Logging, Fishing and Hunting, and Agricultural and Forestry Services.

The agricultural sector purchases \$1.1 billion of inputs from other sectors⁴, and if no anti-pyramiding provisions were applied in the agricultural sector, the state would be collecting about \$67 million from the purchase of intermediate inputs in the agricultural sector (1.1 x 0.6).

The most important business input in this sector is the purchase of livestock, by the livestock sector itself—calves purchased to be fed and sold as cattle. About \$270 million are spent on these purchases which are suspended from the GRT, resulting in a pyramiding relief of \$17

⁴ It is not contradictory that a sector has a lower GSP than the value of inputs purchased.

million.⁵ Similarly, under the same sub-sector, crops and feed to be used in the livestock sector are exempt from the Gross Receipts Tax, which provides relief of \$7.5 and \$7.6, respectively (See Table 3).

Other inputs such as agricultural services, chemicals, machinery (of which only 50% is suspended) and wholesale trade, all combined generate relatively little additional pyramiding relief, \$4.5, \$0.5, \$0.2 and \$3.5 million, respectively. The total relief to the agricultural sector is \$45 million, as it is shown in Table 3. Table 4 shows the total Pyramiding that occurs in the sector, after the relief is deducted.

Table 3

Pyramiding Relief in the Agricultural Sector

	Purchases	Relief
Livestock	\$ 270.0	\$ 16.2
Feed	\$ 127.5	\$ 7.7
Crops	\$ 113.1	\$ 6.8
Agricultural Services	\$ 87.5	\$ 5.3
Wholesale	\$ 85.9	\$ 3.9
Transportation	\$ 49.3	\$ 3.0
Other	\$ 37.5	\$ 2.3
Total Relief	\$ 770.8	\$ 45.0

Table 4

Pyramiding in the Agricultural Sector

Total Business Inputs	\$ 1,118.8
GRT on Total Business Inputs	\$ 67.1
Pyramiding Relief	\$ 45.0
Pyramiding	\$ 22.2

The Mining Sector

The Gross State Product of Mining is \$3.1 billion, about 5.7% of total GSP for New Mexico. The main sub-sectors include Oil and Gas Extraction, Mining, and Mining Support Services. Total purchases of inputs from other business by this sector are about \$2.6 billion and the total GRT taxes that would be paid in the case that there were no relief mechanisms, are \$153.5 million.

The main sub-sector from which inputs are purchased in the mining sector are Mining Support Services, which are consumed primarily by the Oil and Gas Extraction activities and by the Mining Support Services sub-sector itself. Purchases from this sub-sector reach \$1.2 billion, and they are not suspended from the GRT. Significant purchases by the mining

⁵ All these suspensions are enumerated in Table 2, and the corresponding NMSA citations are also included in that Table.

sector also include petroleum and fuels, and professional services, which likewise do not get relief from the GRT.

In general terms, modest relief is given to this sector. Chemicals purchased by the mining sector are suspended, which actually results in less than \$1 million of relief.⁶ Total relief, as indicated in Table 5, which includes Insurance, Transportation and other items, is on the order of \$9.1 million. Therefore, pyramiding of \$144.4 million is estimated to occur in the Mining sector.

Table 5

Pyramiding in the Mining Sector

Total Business Inputs	\$ 2,557.5
GRT on Total Business Inputs	\$ 153.5
Pyramiding Relief (Includes Chemicals)	\$ 9.1
Pyramiding	\$ 144.4

The Utility Sector

The Utilities sector comprises about 2% of the New Mexico GSP, and purchases about \$445 million in business inputs from other sectors. The most important input is the purchase of fuels, which is more than one third of all the business purchases by this sector. The utility sector gets no pyramiding relief for purchasing fuel. According to the numbers used in this analysis the relief would be in the order of \$11.8 million if fuels were to be suspended.

Another important input in the sector is Pipeline Transportation and Professional, Scientific and Technical Services, which do not get pyramiding relief.

Table 6

Pyramiding in the Utility Sector

Total Business Inputs	\$ 445.0
GRT on Total Business Inputs	\$ 26.7
Pyramiding Relief (Insurance)	\$ 0.5
Pyramiding	\$ 26.2

One of the important issues in analyzing pyramiding in this sector is that Utilities are traditionally natural monopolies, and as such, are regulated by the government. If a regulatory strategy is based on Rate or Return of the utility companies, then all costs are included at the time a request is made to raise rates (including taxes.) In this case, firms do not have a strong incentive to ameliorate pyramiding, since all taxes are passed on to the

⁶ This is a preliminary estimate of the revenue loss, using the IO model.

consumer. This status as a monopoly is deteriorating somewhat as more and more utilities find themselves in a less regulated and more market driven competitive market.

The Construction Sector

The Construction Sector comprises about 4.2% of total GSP in New Mexico. This is a sector that benefits from considerable pyramiding relief, compared to others, such as Utilities and Mining.

Construction is different from other sectors in that services performed to carry out the construction are suspended from the GRT. Inputs that become an integral part of the construction project are also suspended, and these include wood products, metal and plastics. Taxes on machinery and transportation equipment are not suspended. Thus, the total relief that this sector gets is \$71.6 million as it is shown in Table 7.

Table 7

Pyramiding Relief in the Construction Sector

	Purchases	Relief
Inputs that become an Integral Part of Final Product	\$ 245.6	\$ 14.7
Wholesale and Retail	\$ 490.9	\$ 9.7
Transportation	\$ 736.5	\$ 24.5
Insurance	\$ 62.1	\$ 3.7
Professional and Tech. Services	\$ 251.4	\$ 15.1
Motor Vehicles and Parts	\$ 64.3	\$ 3.9
Total Relief		\$ 71.6

As it shown in Table 8, Pyramiding in the construction sector is in the order of \$25.7 million. Potential collections of GRT taxes from the purchases of inputs are \$97.3 million (1.6 x 0.6), but \$71.6 of those inputs are suspended. Coincidentally--and independently from these calculations--the Taxation and Revenue Department estimates that \$80 million in pyramiding relief is provided to the sector, which is close to the number obtained with the IO model.

Table 8

Pyramiding in the Construction Sector

Total Business Inputs	\$ 1,621.8
GRT on Total Business Inputs	\$ 97.3
Pyramiding Relief	\$ 71.6
Pyramiding	\$ 25.7

The Manufacturing Sector

The manufacturing sector GSP is \$4.8 billion and it comprises 8.8% of total GSP. It contains about 21 sub-sectors, among which the most important, in terms of purchase of business inputs are: Petroleum and Coal Production, Food Products, and Computers and Other Electronics.

The manufacturing sector purchases a significant amount of inputs from other sectors, approximately \$5.3 billion, which at a GRT rate of 6% would correspond to \$318 million, without taking the suspensions into consideration.

Table 9

Inputs that Become an Integral Part of the Output in the Manufacturing Sector		
Type Codes.Description	Business Purchases	GRT at 6%
111 Crop Farming	\$ 54.2	\$ 3.3
112 Livestock	\$ 486.2	\$ 29.2
113 Forestry & Logging	\$ 0.5	\$ 0.0
114 Fishing- Hunting & Trapping	\$ 0.4	\$ 0.0
211 Oil & gas extraction	\$ 961.3	\$ 57.7
212 Mining	\$ 56.5	\$ 3.4
213 Mining services	\$ 2.1	\$ 0.1
311 Food products	\$ 193.5	\$ 11.6
312 Beverage & Tobacco	\$ 0.7	\$ 0.0
313 Textile Mills	\$ 11.6	\$ 0.7
314 Textile Products	\$ 0.3	\$ 0.0
315 Apparel Mfg	\$ 1.1	\$ 0.1
316 Leather & Allied	\$ 0.6	\$ 0.0
321 Wood Products	\$ 7.2	\$ 0.4
322 Paper Manufacturing	\$ 1.1	\$ 0.1
323 Printing & Related	\$ 8.6	\$ 0.5
324 Petroleum & coal prod	\$ 305.2	\$ 18.3
325 Chemical Manufacturing	\$ 58.8	\$ 3.5
326 Plastics & rubber prod	\$ 94.9	\$ 5.7
327 Nonmetal mineral prod	\$ 2.1	\$ 0.1
331 Primary metal mfg	\$ 4.8	\$ 0.3
332 Fabricated metal prod	\$ 12.5	\$ 0.8
334 Computer & oth electron	\$ 427.4	\$ 12.8
337 Furniture & related prod	\$ 4.4	\$ 0.3
339 Miscellaneous mfg	\$ 3.6	\$ 0.2
Total	\$ 2,699.8	\$ 149.2

The largest input (in dollar value) in the manufacturing sector is the value of livestock and other food products procured by the food manufacturing sub-sector. These two items alone amount to \$670 million but taxes on these inputs are suspended. Another important input is

the purchase of Oil and Gas Extraction products by the Petroleum and Coal Industry, which amounts to \$1.2 billion. These purchases are also suspended from the GRT tax. Computer and Electronic purchases by the same sector itself are also important, and are in the order of \$330 million, which are also mostly suspended.

Table 10
Pyramiding in the Manufacturing Sector

Total Business Inputs	\$ 5,307.0
GRT on Total Business Inputs	\$ 318.4
Pyramiding Relief	\$ 149.2
Pyramiding	\$ 169.3

The Wholesale and Retail Sector

Wholesale and Retail activities comprise about 11% of GSP. These two sectors combined purchase inputs in the amount of \$1.8 billion, which at a 6% GRT rate would bring about \$110 million. Suspensions in these two sectors are minimal. Relief is applied to the insurance and transportation inputs that would account for approximately \$4 million, as it is shown in Table 11.

It should be noted again that products “moved” by these sectors to the final consumer (that is, sales for resale), are not considered inputs and are not being studied here.

Table 11
Pyramiding in the Wholesale and Retail Sectors

Total Business Inputs	\$ 1,839.0
GRT on Total Business Inputs	\$ 110.3
Pyramiding Relief	\$ 4.0
Pyramiding	\$ 106.3

The Transportation and Warehouse Sector

The transportation sector comprises about 2.2% to GSP. It includes several sub-sectors, such as air, rail, truck, pipeline transportation, plus postal services, couriers and warehousing and storage. This sector purchases inputs for the amount of \$990 million, which would result in \$59.4 in pyramiding. There are some suspensions however.

The most important suspension is the purchase of transportation services, from the same sector. This plus the insurance suspension, amounts to about \$11.7 million. As it is shown in Table 12, this sector pyramids in the order of \$47.7 million.

Table 12

Pyramiding in the Transportation and Warehouse Sectors

Total Business Inputs	\$ 990.0
GRT on Total Business Inputs	\$ 59.4
Pyramiding Relief	\$ 11.7
Pyramiding	\$ 47.7

Table 13

Transportation Services Used by the Transportation Sector

	B to B by the Transportation Sector	GRT 6%
481 Air transportation	\$ 1.1	\$ 0.1
482 Rail Transportation	\$ 9.4	\$ 0.6
483 Water transportation	\$ 0.0	\$ 0.0
484 Truck transportation	\$ 109.1	\$ 6.5
485 Transit & ground passengers	\$ 4.8	\$ 0.3
486 Pipeline transportation	\$ 2.5	\$ 0.2
487 Sightseeing transportation	\$ 47.1	\$ 2.8
491 Postal service	\$ 8.1	\$ 0.5
492 Couriers & messengers	\$ 5.3	\$ 0.3
493 Warehousing & storage	\$ 7.7	\$ 0.5
Total	\$ 195.2	\$ 11.7

The Information Sector

Total purchases of business inputs in the Information sector is on the order of \$686.7 million. Broadcasting services purchased by the Information sector are generally suspended because they are considered sales for resale. About \$200 million are spent on these items, which represent a pyramiding relief of \$12 million. Additionally there is other relief in the form of insurance and other types, which amount to \$4.9 million.

Table 14

Pyramiding in the Information Sector

Total Business Inputs	\$ 686.7
GRT on Total Business Inputs	\$ 41.2
Pyramiding Relief	\$ 16.9
Pyramiding	\$ 24.3

The Finance and Insurance Sector

The Finance Sector comprises about 3.6% of GSP and it consists of Credit Intermediation activities, Securities and other Financial Activities, Insurance companies and Fund-Trusts management.

The sector of Finance and Insurance receives almost no pyramiding relief. The total business inputs purchased by this sector, \$881.4 million, are not suspended, except for the insurance activities themselves, that the sector purchases, which is in the order of \$26.7 million.

Table 15

Pyramiding in the Finance and Insurance Sector

Total Business Inputs	\$	881.4
GRT on Total Business Inputs	\$	52.9
Pyramiding Relief	\$	26.7
Pyramiding	\$	26.2

The Real Estate and Rental Sector

The Real Estate and Leasing sector represents a significant part of the GSP in New Mexico, more than 12%, \$6.8 billion, but it purchases relatively few inputs, in the order of \$761 million, most of it from the Real Estate sector itself, and uses services in the area of Administrative Support. Other significant inputs are in the area of Utilities and Construction.

The sector only receives relief from the purchases coming from the same sector, as sale for resale purchases and insurance. Total pyramiding relief is in the order of \$12.6 million, and the Pyramiding left is around \$33.1 million.

Table 16

Pyramiding in the Real Estate and Leasing Sector

Total Business Inputs	\$	761.0
GRT on Total Business Inputs	\$	45.7
Pyramiding Relief	\$	12.6
Pyramiding	\$	33.1

The Services Sector

In this sector, three types of services are included, Professional and Scientific Services, Management of Companies, and Administrative and Waste Services. It is assumed that none of these three subsectors receive pyramiding relief. They are highly intensive in labor and make few business purchases of tangibles. These three sectors comprise almost 10% of GSP (\$5.4 billion), but they purchase only \$1.1 billion from other sectors, and they Pyramid in the order of \$64.4 million.

Table 17
Pyramiding in Services

	Business Purchases	6% GRT
Professional and Scientific Services	548.4	32.9
Management of Companies	108.1	6.5
Administrative and Waste Services	416.8	25.0
Total Pyramiding		64.4

The Educational Services Sector

The Educational sector is very small in terms of GSP, according to the Bureau of Economic Analysis. It has a value of only \$261 million, less than 0.5% of GSP. It is labor intensive, and it purchases inputs from other sectors in the order of \$90.4 million, which without suspensions, would bring about \$5.4 million in GRT on business purchases.

Since most of these services are provided by governmental organizations and by non-profits whose receipts are exempt and whose purchases of tangibles are also not taxed, the pyramiding that occurs in the educational services sector is basically negligible, or in the neighborhood of \$1 million.

The Health Care and Social Assistance Services Sector

The Health Care and Social Assistance sector is significant in terms of GSP in the state of New Mexico. It comprises 6.2% of GSP. The Health Care and Social Assistance sector consists of establishments providing health care and social assistance for individuals. The industries in this sector are varied, starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance.

Most of these establishments are either Non-Profits or are Governmental entities; therefore their purchases of tangible inputs are suspended from the GRT. However, there are several For-Profit hospitals that should be counted in this analysis. To find out what proportion of these services are provided by the private sector, a simple count was conducted to obtain the

proportion of private hospitals vis-à-vis non-profit hospitals and federal hospitals, in New Mexico. This percentage, (40% private and 60% non-profit or governmental) was used to calculate Pyramiding in this sector.

Table 18

Pyramiding in the Health Sector

Total Business Inputs	\$ 1,294.0
GRT on Total Business Inputs	\$ 77.6
Pyramiding Relief	\$ 51.0
Pyramiding	\$ 26.6

The Arts, Accommodation and Hotels, and Other Services Sector

Arts, Accommodations and Hotels and Other Services are presented together in this section, because these sectors receive limited relief from pyramiding, except the item of food inputs for restaurants and hotels that are suspended from the GRT, because they are considered sale for resale. These three sectors pyramid in the order of \$5.5, \$19.5 and \$7.0, respectively.

Table 19

	Arts	Accomo. and Hotels	Other Services
Total Business Inputs	\$ 124.6	\$ 545.0	\$ 254.0
GRT on Total Business Inputs	\$ 7.5	\$ 32.7	\$ 15.2
Pyramiding Relief	\$ 2.0	\$ 13.2	\$ 8.2
Pyramiding	\$ 5.5	\$ 19.5	\$ 7.0

Summary

In Table 20 the overall results from this section are reported. Total purchases of business inputs in the New Mexican economy are approximately \$19.6 billion as it was reported in Table 2, of which the State could be receiving \$1.175 billion in Pyramiding revenues, if no provisions existed in the law to curtail Pyramiding.

The third column lists the amount of Pyramiding relief that is granted to each one of the sectors. As it shown in the Table, about \$149 million are granted as relief to the Manufacturing sector, while \$71 is granted to the Construction sector and \$45 million to the Agricultural sector. In total, The current NM tax law contains \$426 million in Pyramiding relief, which results in an estimate of \$748 million being collected as a result of Pyramiding (1,175 – 426), which is the “ceiling” minus the relief granted in current law.

The fourth column reflects the Pyramiding that remains and is not “solved” by current law. Manufacturing and Mining are left with significant Pyramiding (\$169 and \$144 million, respectively). Retail and Professional Services are also left with significant Pyramiding.

The fifth column reflects the percentage of Pyramiding that is “solved” by current law, and by sector. It is interesting to note that Construction and Agriculture have significant relief in percentage terms,

There are sectors such as Manufacturing that, despite receiving significant relief, still have significant pyramiding. In the Agricultural sector, Anti-Pyramiding provisions are relatively effective in curtailing tax on business purchases. Mining on the other hand, receives little relief. Utilities, in general, purchase few inputs from other sectors, except fuel, and it receives almost no relief.

According to these estimates, Pyramiding in New Mexico represents about 32% of GRT revenues collected (\$2.3 billion). If the Pyramiding existing in NM were to be eliminated, the GRT tax rate would have to be increased in 2 percentage points in order to achieve “revenue neutrality”. This is calculation is done without considering the contraction in demand, due to the price elasticity of demand.

Table 20
Summary of Results

	Value of Business Purchases (1)	Potential Tax from All Business Purchases (2)	Pyramiding Relief Under Current Law (3)	Tax Collected from Pyramiding (4=2-3)	Percentage of Pyramiding "Solved" by Current GRT Law (5=3/2)
Agriculture	\$1,118.8	\$67.1	\$45.0	\$22.1	67.0%
Mining	\$2,557.5	\$153.5	\$9.1	\$144.4	5.9%
Utilities	\$445.0	\$26.7	\$0.5	\$26.2	1.9%
Construction	\$1,621.8	\$97.3	\$71.6	\$25.7	73.6%
Manufacturing	\$5,307.0	\$318.4	\$149.2	\$169.2	46.9%
Wholesale	\$536.0	\$32.2	\$2.1	\$30.2	6.5%
Retail	\$1,303.0	\$78.2	\$1.9	\$76.2	2.4%
Transportation	\$990.0	\$59.4	\$11.7	\$47.7	19.7%
Information	\$686.7	\$41.2	\$16.9	\$24.3	41.0%
Finance	\$881.4	\$52.9	\$26.7	\$26.2	50.5%
Real Estate	\$761.0	\$45.7	\$12.6	\$33.1	27.6%
Professional, Admin, Manag,	\$1,073.3	\$64.4	\$1.0	\$63.4	1.6%
Education	\$90.4	\$5.4	\$4.4	\$1.0	81.1%
Health	\$1,294.0	\$77.6	\$51.0	\$26.6	65.7%
Arts	\$124.0	\$7.4	\$2.0	\$5.4	26.9%
Accom and Hotels	\$545.0	\$32.7	\$13.0	\$19.7	39.8%
Other Services	\$254.0	\$15.2	\$8.0	\$7.2	52.5%
Total	\$19,588.9	\$1,175.3	\$426.7	\$748.6	36.3%

Other Studies that Measure Pyramiding

In this section the results of other efforts to estimate Pyramiding in New Mexico are discussed. The estimation of Pyramiding is not an exact science and has to be carried out indirectly. Businesses do not report the extent to which Pyramiding is affecting their activities and there is no hard data. The difficulty in the estimation in no way implies that Pyramiding is not occurring, and certainly does not imply that Pyramiding is not having a real effect on economic activity and tax burdens.

In the present study, the estimation process was aided by the construction of an Input/Output economic model, which provides relatively reliable data on business purchases by sector, at a respectable level of disaggregation. A sample of the disaggregation level that can be achieved by the IO model is presented in the Appendix, where business inputs by sectors are reported.⁷ (Note: due to time, space and printing costs, the Appendices will only be available electronically.) The estimates have also relied on official data, the legal framework and on the opinion of experts.

In this section, two efforts at the national level are reported, the study by Ring (1999) and by COST (2005). A third estimate is obtained by using the “ceiling” or maximum pyramiding calculated in this study and deducting the revenue loss estimated by the Taxation and Revenue Department that results from suspension mechanisms directed at Pyramiding.

Ring

Using US Census Data and the Consumer Expenditure Survey, Ring (1999) examined the sales tax incidence for the 46 states that apply a sales tax, including New Mexico. The author calculated that 59% of the sales taxes are paid by the consumer and 41% by businesses, at the national level. The author suggests that the business burden is composed mainly of taxes paid on business purchases.

In the case of New Mexico it is reported that 50% of the GRT collections are paid by businesses, mainly through purchases of inputs. Using recent GRT collections reported by TRD (\$2.3 billion), Pyramiding would be in the order of \$1.15 billion, in New Mexico, according to Ring.

COST Study

The main objective of the Council on State Taxation (COST) study (Cline, et. al., 2005) is to caution states about the Pyramiding that would occur if those states, and particularly Texas, were to include services in their sales tax systems. The COST study also uses Input Output models to carry out the calculations.

⁷ At the request of the reader more disaggregated data can be provided.

COST reports that \$100 billion is collected from taxation of business purchases (Pyramiding) at the national level. Carrying out a “back-of-the-envelope” calculation, \$345 per capita is paid in taxation of business purchases, in the nation. If the population of New Mexico is 1.9 million, then taxation of business purchases should be in the order of \$655 million, for NM to be an average state.

For the state of New Mexico the study reports that 55% of the GRT is paid by businesses, in the form of Pyramiding. It is the third state with the highest percentage, after Louisiana and Washington. It should be pointed out that Louisiana includes a very limited number of services in its tax base, therefore indicating that the inclusion of services is not a necessary requirement for the tax system to Pyramid.

The GRT collections used in the COST study for FY 2003 came from the Census Bureau. That amount is significantly less than collections reported by TRD for the same year (TRD reported \$2.17 vs the \$1.87 reported by the Census Bureau). If the percentage reported by COST (55%) is applied to collections reported by TRD, then the pyramiding estimate would be \$1.19 billion, very close to the estimate by Ring.

The COST study reports a pyramiding index by sector and based on the percentage of pyramiding rather than the dollar value for the sector. Based on the COST analysis, the sectors that pyramid the most are Primary and Fabricated Metals, Professional and Business Services (PBS), and Financial Services. The other sectors follow far behind these three. The PBS sector actually does not have any provisions to avoid pyramiding, that’s why they are high in the ranking on a percentage basis.

For the average state, the COST study indicates that taxing services would increase revenues by 33%. The NM IO model indicates that \$366 million are currently collected from services, which is 39% of NM GRT collections.

Using TRD Data

The total amount of Pyramiding taking place in New Mexico can also be calculated, globally, by the following formula:

$$PY = MAX_{io} - SUS_{trd}$$

Where PY is total Pyramiding in the state of New Mexico, MAX_{io} is the Maximum Pyramiding possible, as calculated by the I/O model, and SUS_{trd} is total suspensions as reported by TRD to curtail Pyramiding.

$$PY = \$1,175 - \$420$$

$$PY = \$775$$

Summary of Estimates

Table 21 summarizes the estimates reported in this NMTRI study. The first estimate, the “ceiling” is the calculation of total purchases of business inputs in the NM economy, multiplied by the 6% rate. The COST estimate of \$1,190 million is above the “ceiling” and is therefore an over-estimation of possible Pyramiding. The estimate by Ring is also very high, almost reaching the “ceiling.” Importantly, both of these results reflect Pyramiding as if NM had not enacted any anti-Pyramiding exemptions or deductions.

As it was stated above, the \$655 was obtained by weighing the national estimate of Pyramiding, with respect to population for the state of NM. The estimates of the present study and the estimate using “revenue losses” by TRD coincide to a certain extent, mainly because the same “ceiling” from the IO model was used in both estimates.

Clearly the Estimates by Ring and Cost are too close, or even higher, than the “ceiling” obtained by the IO model. And clearly also, New Mexico does have a set of suspension mechanisms that are currently being applied to curtail Pyramiding. The estimates by NMTRI and TRD share the same “ceiling” obtained by the IO model, which indicates that the detailed sectoral estimation by NMTRI, nearly coincide with the revenue loss estimates by TRD, in the aggregate.

Both, the COST study and the NMTRI study use IO tables, but the COST study is national and therefore reports results for all states. The NMTRI makes use of a NM IO model, and delves in more detail in the NM tax law, with the aid of policy experts that have experience in the field. Ring uses a method that relies on Census and Survey Data.

Table 21
Estimates Reported in this Study

Pyramiding “Ceiling” Calculated by the IO Table	\$1,180
COST Estimate of Pyramiding (2005)	\$1,190
Estimate of Pyramiding, Ring (1999)	\$1,150
Using TRD Data	\$775
Sectoral Study (NMTRI)	\$748

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