

Wisconsin's Manufacturing Machinery & Equipment Tax Exemptions: A Framework for Analysis

Alison H. Bergum
Pär Jason Engle
Michael A. Goodman
Sarah A. Maguire
Amanda M. Rogers

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For additional copies:
Publications Office
La Follette School of Public Affairs
1225 Observatory Drive
Madison, WI 53706

www.lafollette.wisc.edu
publications@lafollette.wisc.edu

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Foreword

This report on Wisconsin's manufacturing machinery and equipment (M&E) tax exemptions is the product of a collaboration between the Robert M. La Follette School of Public Affairs at the University of Wisconsin–Madison and the Wisconsin Department of Revenue. Our objective is to provide graduate students at La Follette the opportunity to improve their policy analysis skills while contributing to the capacity of the Department of Revenue to analyze and develop policies on issues of concern to the citizens of the state.

The La Follette School offers a two-year graduate program leading to a master's degree in public affairs. Students study policy analysis and public management, and pursue a concentration in a public policy area of their choice. They spend the first year and a half taking courses that provided them with the tools needed to analyze public policies. The authors of this report are all enrolled in Public Affairs 869, Workshop in Program and Policy Analysis, Domestic Issues. Although acquiring a set of policy analysis skills is important, there is no substitute for doing policy analysis as a means of learning policy analysis. Public Affairs 869 provides graduate students that opportunity.

The students were assigned to one of four project teams. One team worked on this project for the Department of Revenue, while the other teams worked on projects for the Joint Legislative Council, the Budget and Management Division of the City of Milwaukee, and the Economic Development Commission and the Mayor's Office of the City of Madison. The topic of this report—an analysis of the M&E property and sales tax exemptions—was chosen by Secretary of Revenue Michael Morgan in consultation with his staff.

All state governments, including Wisconsin, use tax policy as a tool for promoting economic development. In 1974 Wisconsin began exempting manufacturing machinery and equipment from both the property and the sales tax. The purpose of these exemptions was to encourage manufacturing firms to both stay and to expand operations within the state. This report uses data from a sample of tax returns filed by manufacturing firms to develop a more precise estimate of the dollar magnitude of these exemptions. The authors also provide a critical review of the academic literature on tax policy and economic development, and develop a general framework that could be used for analyzing proposed tax policies designed to provide incentive for economic development with the state. They then use their analytic framework to provide an analysis of the M&E exemptions.

This report does not provide the final word on the complex issues the authors address. The graduate student authors are, after all, relatively inexperienced policy analysts, and the topic they have addressed is large and complex. Nevertheless, much has been accomplished, and I trust that the students have learned a great deal, and that the Secretary and staff of the Department of Revenue will profit from their analysis of the M&E exemptions and the development of a framework to assess tax policy proposals designed to provide incentives for economic development within the state.

This report would not have been possible without the support and encouragement of Secretary Morgan, and the advice and guidance of Deputy Secretary Laura Engan and DOR senior staff members Milda Aksamitauskas, Rebecca Boldt, Audra Brennan, Blair Kruger, Pamela Walgren, and Bill Wardwell. A number of other people also contributed to the success of the report. Their names are listed in the acknowledgments.

The report also benefited greatly from the active support of the staff of the La Follette School. Terry Shelton, the La Follette outreach director, along with Kari Reynolds, Elizabeth Hassemer, and Gregory Lynch contributed logistic and practical support for the project. Karen FASTER, La Follette publications director, edited the report and shouldered the task of producing the final bound document.

I am very grateful to Wilbur R. Voigt whose generous gift to the La Follette School supports the La Follette School policy analysis workshop projects. With his support, we are able to finance the production of the final reports, plus other expenses associated with the projects.

By involving La Follette students in the tough issues faced by state government, I hope they not only have learned a great deal about doing policy analysis but have gained an appreciation of the complexities and challenges facing state and local governments in Wisconsin. I also hope that this report will contribute to the work of the Department of Revenue and to the ongoing public discussions of policies to spur economic development in Wisconsin.

Andrew Reschovsky
April 29, 2005

Acknowledgments

Many people contributed tremendous time and energy to this project. First, we would like to thank Milda Aksamitauskas from the Wisconsin Department of Revenue for her invaluable assistance and advice. We also thank Rebecca Boldt, Audra Brennan, Laura Engan, Blair Kruger, Pamela Walgren, and Bill Wardwell, all of the Department of Revenue, for their assistance with planning our project, researching these exemptions, and editing our work. Thank you also to the analysts and staff at the Eau Claire, Fond du Lac, Green Bay, Madison, and Milwaukee district offices, who graciously provided us with access to their files and their workspaces in our data collection process.

We also extend our gratitude to Professor David Marcouiller, University of Wisconsin–Madison, Department of Urban and Regional Planning; Professor Steven Deller, University of Wisconsin–Madison, Department of Agriculture and Applied Economics; Professor Emeritus Jon Udell, University of Wisconsin–Madison, School of Business; and Rick Olin of the Legislative Fiscal Bureau for their assistance as we planned our project. Thank you also to Lisa Beane, Kim Herb, Alan Paberzs, Melissa Schmidt, and Sam Wayne, who provided valuable peer editorial feedback. Finally, thank you to Professor Andrew Reschovsky for his guidance and continued feedback on our work.

Executive Summary

Wisconsin first implemented the manufacturing machinery and equipment (M&E) property and sales tax exemptions in 1974 in an attempt to stimulate the manufacturing sector, promote economic development, and retain manufacturing firms in the state. At the request of the Wisconsin Department of Revenue (DOR) this report examines the efficacy of these exemptions. Specifically, it: (1) presents a critical review of the academic and professional literature on tax policy and economic development; (2) derives more accurate estimates of the M&E sales and personal property tax exemptions; and (3) develops a framework to analyze the impact of these and similar tax policies on economic development. By applying this framework to the M&E exemptions, this report not only demonstrates that it is feasible to conduct comprehensive analyses of tax incentives, it can guide analyses of tax incentives designed to serve as engines for economic development.

The first component of this report is a literature review focused on the rationales for creating tax incentives as well as methods for evaluating and modeling their impacts and effectiveness. Although little consensus exists on the effectiveness of these policies, most experts agree that tax incentives will not damage a state's economic climate. Moreover, because there is a preponderance of economic development policies among states, these policies may actually be necessary for regional competitiveness. That said, experts also agree that states should not sacrifice spending on public services that firms value. Perhaps most importantly, if states do choose to enact tax incentive policies, it is important to establish clear goals and follow up with comprehensive evaluations to determine whether these goals are met.

Next, this report seeks to establish a more precise measurement of Wisconsin's M&E property and sales tax exemptions. To begin this process, we selected a sample of firms from Wisconsin's 10,648 manufacturing tax returns for 2004—this sample represents 46.2 percent of the total value of all manufacturers' personal property. From this sample, we determined that exempt M&E represents approximately 93 percent of the total M&E reported in Wisconsin each year. This differs from DOR's current "rule of thumb" estimate that 10 percent of Wisconsin's M&E personal property is taxable and 90 percent is exempt. Our newly derived estimate for the value of exempt M&E is \$16.5 billion, noticeably greater than DOR's current \$11.9 billion figure.

Last, we present an analytical framework to assess the impact of the M&E exemptions on economic development in Wisconsin. This framework, informed by widely accepted tenets of sound tax policy and best practices among states and researchers, is based on the following questions: What is the economic development value of this policy in terms of job creation, firm retention and reinvestment, and firm attraction? Is this policy equitable? Is it efficient? And, how do the administrative costs of this policy relate to its benefits? We examine the M&E exemptions using our framework for analysis. In doing so, we rely on IMPLAN software to model a range of possible economic development impacts from the M&E exemptions. This report closes with a discussion of the tradeoffs that are inherent to tax incentive policies and suggests how to apply the principles of this framework to similar policies.

Introduction

Although state and local governments have long sought to retain, attract, and promote the expansion of businesses within their borders, it was not until the mid- to late-1970s that business tax incentives gained in popularity. Since then, tax incentives have expanded rapidly in scope, size, and prevalence to include corporate income tax credits, small business capital gains exclusions, property tax exemptions, and sales tax exemptions. Although these incentives vary in their design and focus, they are all geared toward a similar goal: making one state or municipality more competitive than another in terms of business retention or relocation.

At the request of the Wisconsin Department of Revenue (DOR), this report examines the impact and efficacy of one particular set of state tax exemptions, the manufacturing machinery and equipment (M&E) exemptions. These exemptions provide Wisconsin manufacturers with preferential tax treatment in the short-term and long-term in that manufacturers are not required to pay sales tax on eligible M&E at the time of purchase or personal property tax during the equipment's useful life. This report is intended to be a stand-alone analysis of Wisconsin's M&E exemptions and a guide for future analyses of other types of preferential tax treatment designed to serve as engines for economic development.

The first section of this report presents a critical review of the academic and professional literature on tax policy and economic development. The review focuses on the rationale for creating tax incentives as well as methods for evaluating and modeling their impacts and effectiveness. Additionally, it summarizes available conventional wisdom and discusses dissenting views in the field. The second section of the report provides a brief discussion of the role of the manufacturing industry in Wisconsin's economy, along with a description of the state's tax treatment of M&E. Third, the report presents a newly derived estimate of the value of Wisconsin's M&E exemptions. The report then introduces a framework to evaluate the impact of the M&E exemptions. This framework, informed by widely accepted tenets of sound tax policy¹ and best practices among states and academics, is based on the following: What is the economic development value of this policy in terms of job creation, firm retention and reinvestment, and firm attraction? Is this policy equitable? Is it efficient? And, how do the administrative costs of this policy relate to its benefits? This framework includes an analysis of Wisconsin-specific economic development impact scenarios modeled using IMPLAN software for economic development forecasting. In the last section of this report, this framework is applied to the M&E exemptions, modeling the impact of these exemptions on economic development in Wisconsin and outlining guidelines for how best to apply the principles of the analysis to other types of tax incentives.

¹ These tenets have been accepted by the National Council of State Legislatures. They include: (1) tax systems should provide appropriate revenues; (2) tax systems should be equitable; (3) tax systems should be easily and economically administered; and (4) tax systems should ensure accountability. For more information, see Brunori, 1997.

Economic Development, Firm Location Decision-Making and Tax Policies: Background

Localities have attempted to create policy that attracts businesses since the early U.S. colonial period, when towns offered payments to lure needed businesses and skilled craftsmen. In 1791, New Jersey used tax incentives to entice Alexander Hamilton to move his factory to the state (Buss, 2001). Today, states create myriad tax incentives designed to attract businesses, spur economic growth, and create jobs. Wisconsin's M&E exemptions are examples of policies that have economic development as their primary goal. The effectiveness of these policies, however, is far from clear. To better understand and evaluate the M&E exemptions and similar tax policies with economic development goals, it is worthwhile to examine available research and expert opinions as they relate to tax incentives, job creation, and firm location decision-making.

A survey of recent literature on tax policies and economic development produces a number of common themes as well as significant divergence of opinion (See Summary of Literature, Appendix A). While most of the literature suggests that tax policies of a given state or locality are not primary factors in firm location decision-making, there is far less agreement on the amount of influence that the tax conditions of a state has on these decisions (Courant, 1994). Similarly, while there is general agreement that the effects of such policies need to be properly measured and evaluated, metrics and methodologies vary widely.

Policymakers rarely recognize this lack of consensus. They often cite tax policies as having critical effects on economic development, but actual proof supporting these claims is rare (Bradbury, Kodrzycki, and Tannenwald, 1997). In fact, of the methods that states use to influence their business climates—regulation, public services, and taxation—tax incentives by far represent the largest dollar amounts (Dabson, Rist, and Schweke, 1996). A 1986 study conducted by the Citizens Research Council found the per-capita expense for business tax incentives for Michigan residents was \$16; New York was \$27; and Louisiana was \$60. To put these numbers in perspective, the U.S. per-capita average for state economic development agency spending in 1994 was \$5 (Bartik, 1994).

Why are tax incentives so widely used when there is little consensus as to whether these policies work and are cost effective? Certainly, even if businesses do not need these incentives in order to remain profitable, they are motivated to seek and support them. At the same time, policymakers can demonstrate through legislation that they have made efforts to improve the economic vitality of their states. But missing from this discussion are comprehensive evaluations of these policies once enacted (Buss, 2001). The studies that do exist often contradict one another and thus can be disregarded by policymakers (Bradbury, Kodrzycki, and Tannenwald, 1997). But even without consensus on the issue, there is relevant information as to what factors businesses do consider when making location and expansion decisions.

Firm Location Decision-Making: Costs Versus Benefits

Because the central goal of economic development policies is to attract, retain, and grow business, much of the discussion centers on the priorities that individual firms set when considering new facilities, expansion, or relocation. As for the efficacy of the policies themselves, consensus on taxation policies with respect to firm location decisions is rare. At a 1996 conference sponsored by the Federal Reserve Bank of Boston, leading experts in the field noted:

The conditions under which state policies can significantly influence business location and economic growth are limited, mainly because the most important determinants of a jurisdiction's relative rate of economic growth are largely beyond the control of state and local governments—for example, labor costs, the availability of appropriately skilled labor, energy costs, climate, and the availability of natural resources. A few experts also noted that competitive forces have narrowed differences among states in both business tax burdens and business incentives, dampening the effectiveness of any new measures (Bradbury, Kodrzycki, and Tannenwald, 1997).

The conventional wisdom in firm location decisions is, simply put, that firms will choose a location that minimizes input costs and increases revenues. Decisions related to costs may include input factors (labor, land, capital); infrastructure and transportation costs; and agglomeration economies (i.e., concentration of similar and complementary businesses). Decisions related to revenue may include proximity to markets and tax incidence (Wasylenko, Bartik, Duncan, and McGuire, 1997). Although most or all of these factors may be considered in firm location decisions, some have more weight than others and weighting schemes may vary by particular firm and by industry. If a firm is relatively labor intensive, for example, then it may look for a location with good public schools in order to attract a qualified labor force, while a firm with significant shipping needs may place more weight on transportation infrastructure (Bradbury, Kodrzycki, and Tannenwald, 1997).

Conventional wisdom also provides insight into the importance of tax climate on firm decision-making. In a 1997 study, for example, Robert Ady, an executive consultant with Deloitte & Touche/Fantus Consulting, notes that tax climate as a decision factor for a manufacturing firm's community selection was far below other factors—such as cost and quality of labor and transportation infrastructure (Ady, 1997). Ady explains that differences in taxes from state to state are only a small share of “geographically variable operating costs” and arguably of far less importance than other factors (Ady, 1997). So, while the tax policies of a state may be part of the decision-making process of a firm, the available evidence suggests it is usually a marginal one. Firms are more likely to look at state taxing conditions in relation to valued public services than state tax policy alone (Wasylenko, Bartik, Duncan and McGuire, 1997; Helms, 1995). Wasylenko et al. argue that firms are more likely to seek an area with taxes that are uniform and that has a wide and diverse tax base in order to support public services at the lowest possible cost to any one sector or type of business (Wasylenko, Bartik, Duncan and McGuire, 1997).

Even though taxes are considered to be a marginal factor in a firm location's decision, they still may be the factor that tips the firm's choice from one state or locality to another. Given this, the zero-sum game that states are playing (sometimes called "smokestack chasing" or "incentive wars") as they compete among one another for firms may only "neutralize" the marginal effects of such policies as states' tax structures and policies become more competitive with each other (Wasylenko, Bartik, Duncan and McGuire, 1997). And, as suggested earlier, as states race to offer greater tax incentives, they may lose the resources needed to compete in terms of public service quantity and quality.²

Efficacy of Policy

Even with uncertainty and disagreement among experts on the impacts and efficacy of tax incentives for economic growth in a state, there is notable consensus in several areas. First, most experts seem to agree that tax incentives will not directly hurt the economic viability of a state (Buss, 2001). They may be costly and not very effective, but they will not damage a state's economic climate. Because there is a preponderance of such policies, they also may be necessary for regional competitiveness. But, there does seem to be agreement that states should not sacrifice spending on public services that firms may value more than the marginal tax differences. Many experts assert that businesses are more concerned that the tax system is stable and consistent, and that it funds the services and programs upon which they rely (Wasylenko, Bartik, Duncan and McGuire, 1997). Finally, several experts noted that if states intend to enact and perpetuate tax incentive policies, they should establish clear goals for these policies and then follow up with comprehensive evaluations to identify whether these goals are being met.

² Although state tax regimes differ, policies to attract and retain businesses are a common theme. Appendix B summarizes state policies relating specifically to manufacturing M&E exemptions.

Wisconsin's M&E Tax Exemptions

Wisconsin first implemented its M&E personal property and sales tax exemptions in 1974 in an attempt to retain manufacturers in the state, stimulate the manufacturing sector, and promote economic development.³ Wisconsin Statutes § 70.11(27)(b) exempts machinery and specific processing equipment, repair parts, replacement machines, and safety attachments that are used exclusively and directly in the production process from the property tax. Wisconsin Statutes § 77.54(5)(d) and (6)(a) exempts mobile units used for mixing and processing and the motor vehicle or trailer on which the unit is mounted; and machines and specific processing equipment and repair parts or replacements thereof used by a manufacturer in manufacturing tangible personal property from the sales tax. In fiscal year 2004, DOR estimates that the M&E sales tax exemption resulted in \$158.6 million in foregone tax revenue, suggesting that a total of \$3.2 billion of M&E was purchased throughout the year (State of Wisconsin Summary of Tax Exemption Devices 2005). While the precise value of exempt property is unknown, DOR estimates the value to be 90 percent of the total value of M&E in the state, \$12.4 billion in 2003, which translates to a “tax shift” of up to \$245.3 million in that year (DOR 2004).

Even with the M&E exemptions, Wisconsin manufacturers pay several billion dollars in combined property and sales taxes each year. In the aggregate, however, the property taxes paid by manufacturers represent a small and decreasing proportion of Wisconsin's total property and sales tax revenue. In fiscal year 2004, for example, Wisconsin manufacturers paid \$292.7 million in property taxes, about 4.1 percent of the total \$7.1 billion paid in property taxes that year. Most of this amount, \$243.7 million, was collected from real estate property tax payments; \$49 million was collected through the personal property tax (Olin, 2005). The manufacturing industry also pays a small proportion of Wisconsin's total sales and use tax collections. In fiscal year 2003, for example, sales and use taxes generated \$3.7 billion in tax revenue. Manufacturers paid \$129.7 million in sales and use taxes, which represent only 3.5 percent of the total sales and use taxes paid in the same year (Russell, 2005).

M&E exemptions cover only a portion of the property owned and purchases made by manufacturers. Real property, including building and real estate owned by manufacturers, represents a far greater share of taxable assets. In 2004, manufacturers' taxable personal property was valued at \$2.15 billion, while real property totaled \$11.40 billion.

The variability and interrelationships of different tax structures complicate any analysis of business tax incentives such as the M&E exemptions. Increasing tax incentives lowers tax revenue from affected businesses, necessitating (a) a shift of tax burden from these businesses to households and businesses unaffected by the exemption; (b) a decrease in government spending; or (c) a combination of decreased spending and increased burden for households and unaffected businesses. Because state grants provide incentives for most local governments (school districts, municipalities, and counties) to maintain or

³ The success of the manufacturing sector plays a substantial role in the vitality of Wisconsin's economy and the well-being of its residents. As of 1998, manufacturing provided 27.8 percent of all earnings in Wisconsin, as compared to a national average of 17.4 percent for this sector (Bernat, 2000).

increase spending, and because local budgets are established based on expected revenue (tax proceeds), it is reasonable to assume that much of the impact of the M&E property tax exemption will “shift” property taxes to households and unaffected businesses—especially in the short-term. Therefore, in this analysis, we use the term “tax shift” when discussing the “uncollected” revenue resulting from the M&E property tax exemption. The sales tax, on the other hand, is described as “lost revenue” or “forgone revenue” because the state does not replace this revenue with funding from other tax sources.

Deriving New Estimates of M&E Tax Exemptions

DOR estimates that Wisconsin forgoes collection (or shifts to other taxpayers) several hundred million dollars each year because of its M&E sales and property tax exemptions. As discussed earlier in this report, these exemptions are intended to promote economic development activities by encouraging manufacturers to expand their operations and relocate to Wisconsin. To gain a better understanding of how the M&E exemptions have influenced economic development, DOR has requested an updated measure of the tax revenue that is forgone or shifted as a result of these exemptions.

Sampling Manufacturing Returns

DOR currently calculates the total value of exempt M&E by imputing 90 percent of the estimated total M&E in Wisconsin in a given fiscal year. While this imputation conveys the approximate magnitude of the state's exempt M&E, it is based upon historical data that may no longer reflect the type and composition of M&E in Wisconsin. This method of imputation, however, is quite practical given current reporting procedures and technological constraints. Manufacturers report the values of their exempt and taxable M&E annually on Form M-P, Schedule M (Machinery, Tools, Patterns, and Shop Equipment) of the Wisconsin tax return. Forms are then analyzed and processed manually. Although aggregate values of net taxable M&E are tracked electronically through DOR's Madison office, the values of exempt M&E are available only on paper tax returns in each of five regional DOR Manufacturing and Utility Assessment offices.

With the goal of obtaining a more precise measurement of Wisconsin's M&E property and sales tax exemptions, we selected a sample of firms from Wisconsin's 10,648 manufacturing returns for 2004. The sample we chose followed a stratified random sampling methodology that divided the population of firms into strata based on quintiles of total personal property and thirteen consolidated Standard Industrial Classification (SIC) codes.⁴ Table 1 helps to explain our sampling process by displaying the number of firms and total personal property sampled from each quintile of total manufacturing personal property.⁵ The top quintiles, as demonstrated in Table 1, contain a greater percentage of manufacturing personal property, and thus were more heavily sampled.

⁴ Stratified random sampling coupled with probability proportional to size is cited as a best practice when sampling for auditing purposes (Yancey and Pfaffenberger, 1997). For more information about this methodology and how it is applied in this analysis, please see Appendix C.

⁵ See Appendix E for a table that displays the distribution of firms and personal property based on Standard Industrial Classification codes.

Table 1			
Sample Distribution of Firms and Personal Property Based on Quintile			
\$2,187.2 million in Total Personal Property			
Quintile	Number of Firms	Percent of Firms Included in Sample	Percent of Property Included in Sample
Top Quintile	30	100.0%	100.0%
2	100	72.0%	69.9%
3	280	41.4%	40.1%
4	796	16.0%	16.6%
5	9,442	1.4%	4.2%
Total	10,648	4.5%	46.2%

Using this sampling method, we selected a sample of 475 manufacturing firms. Of this sample, 420 firms had a current return with a completed Schedule M on file. Those firms that lacked the requisite schedule in the relevant year were omitted from our sample.⁶ Information collected from Schedule M included:

- A. Total Original Cost of Equipment in Previous Year
- B. Additions and/or Deletions of Equipment During Year
- C. Total Original Cost of Equipment in Current Year (A + B)
- D. Current Exempt M&E in Original Cost (C – E)
- E. Current Taxable M&E in Original Dollars
- F. Net Taxable M&E according to schedule (depreciation schedule applied to E)

The sample used in our analysis represents 46.2 percent of all personal property held by Wisconsin manufacturers. In addition, it represents a broad spectrum of industries and geographic locations and includes firms reporting to DOR's five assessment offices.

Data collected from Schedule M for these 420 firms enable us not only to develop estimates for the M&E tax exemption but also to estimate the total original value of machinery and equipment stock, the yearly change in machinery and equipment from 2003–2004, and the composition of the stock and yearly flow of machinery and equipment each year for ten years.

⁶ Nonfilers and unfound returns were considered random nonresponses and were adjusted by weighting class adjustment. This adjustment corrects for nonresponse by dividing the sample into a number of groups, our initial strata, and giving each a weight equal to the inverse of its dollar-weighted response rate (Kalton, 1984).

Estimate of the Value of the M&E Exemptions

Our newly derived values for the M&E personal property tax exemptions are notably divergent from previous estimates. As demonstrated in Table 2, our value of taxable M&E personal property is slightly smaller than the existing estimate listed in the biennial *Summary of Tax Exemption Devices*. Our value of exempt M&E, on the other hand, is significantly larger; our estimate of \$16.5 billion in exempt M&E is approximately 40 percent greater than the current estimate of \$11.9 billion.

Table 2			
Comparison of 2004 M&E Personal Property Estimates			
(\$ billions)			
Estimates	Taxable M&E	Exempt M&E	Total M&E
La Follette Project	\$1.24	\$16.5	\$17.7
Summary of Tax Exemptions	\$1.32	\$11.9	\$13.2
Difference	-\$0.08 (6%)	\$4.6 (39%)	\$4.5 (34%)

* Non-filers may create systematic underestimates of actual assessments (2000-2004) of personal property (doomage assessments).

These new estimates of taxable and exempt M&E indicate that the forgone revenue and the property tax “shift” that occur as a result of the M&E property tax exemptions differ from DOR’s current estimates. As demonstrated in Table 3, the newly derived maximum aggregate estimate for the property tax shift, which we calculate by applying an effective average property tax rate in 2003 of \$20.01 per \$1,000 to the total net exempt M&E, yields a shift of up to \$330 million. According to the *Summary of Tax Exemption Devices* the value of this shift is currently estimated to be \$239 million.⁷ Thus, our newly derived estimates indicate a property tax shift that is almost 40 percent greater than that reported in the *Summary of Tax Exemption Devices*.

Table 3 also demonstrates a difference between our value of the forgone tax revenue resulting from the M&E sales tax exemption and the current estimate of this value. By applying a 5 percent sales tax rate to \$3.09 billion in M&E purchased in 2003, we estimate that the state forgoes approximately \$154.5 million in sales tax revenue as a result of this exemption. However, the *Summary of Tax Exemption Devices* reports an estimated \$158.6 million in forgone revenue—3 percent more than our estimate.

⁷ This figure was calculated using the following formula; $(\$11.89 \text{ billion}/\$1,000)*\$20.01 = \239.2 million .

Table 3		
Comparison of Property Tax and Sales Tax Revenue Estimates		
(\$ millions)		
Estimates	Property Tax: Tax Shift	Sales Tax: Revenue Forgone (or Forgone Revenue)
La Follette Project	\$330	\$154.5
Summary of Tax Exemptions	\$239.0	\$158.6
Difference	\$92.5 (39%)	-\$3.9 (-3%)

Table 4 displays our estimates of the original and depreciated values of total taxable M&E personal property and total exempt M&E personal property. These depreciated values indicate that 7 percent of all M&E in Wisconsin is taxable, as opposed to the current estimate of 10 percent.⁸

Original cost figures are notable as well. As demonstrated in Table 4, the total gross estimated original cost of taxable M&E in Wisconsin is \$3.28 billion, whereas the net estimated value of exempt M&E is \$42.85 billion. The original cost of M&E owned by Wisconsin manufacturing firms is \$46.1 billion.

⁸ Our estimate of 7 percent was calculated using the Total Net Taxable M&E and Total Net Exempt M&E values from Table 3, $1.24/(1.24+16.5) = 7.0$ percent.

Table 4
2004 M&E Estimates - Total and Net (Depreciated) Values
(\$ millions)

Year of Acquisition	M&E 01/01/2003	Changes During 2003	M&E 01/01/2004	Original Cost - Exempt M&E	Original Cost - Taxable M&E	Index/ Useful Life Factor	Net Taxable M&E	Net Exempt M&E	Net Value of Exemption*
2003	-	\$3,091.4	\$3,091.4	\$2,810.2	\$281.2	0.925	\$260.1	2,599.4	\$52.0
2002	3,701.3	-350.4	3,350.8	3,153.0	197.8	0.778	153.9	2,453.0	49.1
2001	3,496.2	28.6	3,524.7	3,305.1	219.6	0.655	143.8	2,164.9	43.3
2000	3,008.7	3.8	3,012.5	2,791.8	220.7	0.557	122.9	1,555.0	31.1
1999	3,853.6	2.3	3,855.9	3,573.8	282.1	0.473	133.4	1,690.4	33.8
1998	3,321.1	2.9	3,324.0	3,101.9	222.1	0.402	89.3	1,247.0	25.0
1997	3,817.5	-83.4	3,734.2	3,560.1	174	0.342	59.5	1,217.6	24.4
1996	3,038.2	-151.2	2,887.0	2,702.9	184.1	0.294	54.1	794.7	15.9
1995	2,355.5	24.2	2,379.8	2,231.7	148	0.252	37.3	562.4	11.3
1994	2,016.6	-126.5	1,890.2	1,739.4	150.8	0.216	32.6	375.7	7.5
1993 & earlier	15,840.5	-769.1	15,071.4	13,876.7	1,194.7	0.132	157.7	1,831.7	36.7
Total	44,449.2	1,672.6	46,121.8	42,846.6	3,275.2	-	1,244.7	16,491.7	330.1

*Net Value represents the tax shift from the M&E exemption (Net Exempt M&E multiplied by the Average Tax Rate of \$20.01 per \$1,000).

A Framework for Analyzing Tax Policies; M&E Exemptions as an Example

Quantifying the value of Wisconsin's exempt M&E is one way to evaluate the impact of the state's M&E property and sales tax exemptions. This method of evaluation indicates that Wisconsin shifts approximately \$330 million in property tax collections to households and non-manufacturing businesses and forgoes another \$154.5 million in tax revenue each year as a result of the exemptions. To understand the impacts of this policy on economic development, however, one must consider more than forgone and shifted tax revenue. Commonly considered factors in a more comprehensive evaluation of tax policy include the policy's ability to increase employment and stimulate economic development in a given area, the extent to which the policy is equitable and efficient, and the administrative costs associated with implementing the policy. These factors form the framework for our analysis of Wisconsin's M&E exemptions.

When developing this framework, we considered "best practices" in evaluation methodology among states and published research, as well as the tenets of sound tax policy. A survey sent to state departments of revenue revealed that most states do not evaluate the impact of property tax exemptions.⁹ Some states, however, do have procedures in place to evaluate tax policies. In Michigan, the Department of Development has conducted Regional Economic Models Inc. (REMI) simulations to evaluate the impacts of a recently proposed tax package. Oklahoma, on the other hand, relies on evaluations prepared by its state universities.

Published research presents a number of methodologies for evaluating specific tax policies in distinct geographic locations. For example, an evaluation of New Jersey's urban enterprise zones included a cost-benefit analysis with an input/output model to simulate the effects of the economic development policy (Rubin, 2001).¹⁰ An evaluation of Georgia's Business Expansion Support Act (BEST) included an econometric model that determined the policy's effectiveness regarding job creation (Ihlanfeldt, 2001). And in Wisconsin, a study by the Legislative Fiscal Bureau recommended using administration, equity, and economic neutrality criteria to evaluate proposals to exempt property (Olin, 2000).

In the remainder of this report, we propose a framework with which to examine tax policies, using Wisconsin's M&E exemptions as an example. This framework evaluates the exemptions in the following contexts: (1) economic development, specifically, job creation, firm retention and reinvestment, and firm attraction; (2) equity as it applies to tax burden; (3) efficiency as demonstrated by firm behavior; and (4) costs associated with administering this policy. As the primary purpose of the M&E exemption is promoting economic development, this area is presented in the most depth. Within each area we suggest methods and tools to use when evaluating tax policies other than the M&E exemption.

⁹ Our surveying process consisted of sending six questions related to M&E exemptions and evaluation methods to all states via the Department of Revenue listserv. Additionally, we reviewed the statutes of all states to determine if they exempt M&E. If a state was found to exempt M&E, and the state did not respond to our survey, we sent a follow-up email to its tax department to ask about evaluation procedures. For a listing of all survey responses please see Appendix B.

¹⁰ See Appendix D for a description of input/output modeling.

Impact of the M&E Exemption Policy on Economic Development

This section of our framework begins with a discussion of the theory behind the evaluation of economic development policies, including descriptions of commonly used concepts. It continues by applying this theory using an economic simulation software package, IMPLAN. This software allows us to model the results of economic development policies in terms of employment and income changes.

The Interstate Elasticity of Taxation on Economic Activity

Timothy Bartik, an economist who has long studied the relationship between tax policy and economic development, has quantified the impact of state and local business taxes on business activity using an interstate elasticity of economic activity. Elasticity captures the effect of a 1 percent change in one variable (taxes) on another variable (business activity) and is the traditional metric used to demonstrate the impact of tax incentives on economic development. Bartik estimates that this elasticity varies between (-0.1) and (-0.6) in relation to business taxes with consensus estimates between (-0.2) and (-0.3). This means that lowering business taxes by 10 percent will increase some or all of the indicators of business activity that Bartik uses—investment, employment, and new business creation—by 1 to 6 percent (Bartik, 1992).

Applying this concept of elasticity and Bartik’s estimates to Wisconsin-specific data provides a picture of the impact tax incentives can have on employment in the state. As seen in Figure 1, assuming an elasticity of (-0.2), a \$50 million reduction in business taxes collected in Wisconsin would create approximately 7,100 new jobs, a 0.21 percent increase in state employment. This calculation translates into an annual cost of \$5,600 (in lost revenue) per job created.¹¹

Figure 1 - Applying Interstate (Interregional) Elasticity

Total Business Taxes in Wisconsin (2001): \$4.801 billion*

Total Employment (2001): 3.419 million**

Annual Tax Revenue per Job: $\$4.801/3.419 = \$1,400$

- (1) A decrease in taxes of \$50 million is $\frac{0.050}{4.801} = 1.04\%$
- (2) At an elasticity of (-0.2), Total Employment changes: $(-0.2)(1.04\%) = 0.21\%$
- (3) Total change of Employment $(0.21\%)(3.419 \text{ million}) = 7,128 \text{ jobs}$

* All taxes combined (i.e., property, sales, income, etc.). Source: Council on State Taxation (COST): Total State and Local Business Taxes: A 50-State Study of the Taxes Paid by Business in 2003

** Source: Bureau of Economic Analysis, Regional Economic Accounts, CA25N Total full-time and part-time employment by industry—Wisconsin

¹¹ (Annual fiscal impact)/(Jobs created) – (Annual tax revenue per job) as indicated above, or alternately, (Annual business tax per job) x (1 + 1/E), where E = interregional elasticity; i.e., $(4.801/3.419) \times (1 + 1/-.02) \approx \$5,600$.

This example of applying elasticities demonstrates the usefulness of forecasting the economic effects of tax policies and reveals the necessity for more precision. Is it plausible to expect all tax policy to affect employment in the same way? What kind of employment would a new tax policy foster? More detailed impact analysis requires more sophisticated tools, methods, and refinement to the specific impact under scrutiny.

Applying IMPLAN: Tax Incentives and Job Creation, Income, and Value-Added

Business tax incentives and economic development are often studied in a way that infers a direct linkage of one to the other. However, the effect of tax incentives on economic development occurs in two separate stages. First, states design tax incentives to induce firms to expand or locate in their state. As noted earlier in this report, it is extremely difficult to generalize about the effects of taxes on firms. Notably, the effects of a tax or tax abatement depend largely on a firm's "sensitivity" to that particular tax. This sensitivity determines where the costs or savings are directed. If the labor for a firm is immobile, a higher tax may reduce wages. If the tax affects the capital needs of a firm, the firm may be more likely to relocate (Wasylenko, Bartik, Duncan and McGuire, 1997).

Second, after this expansion is realized, the new economic activity generates added value for a region through circulation of dollars associated with the new activity. Such "added value" is especially notable when the new or expanded businesses represent basic economies, adding jobs and income that are indirectly associated with, or induced by, the new business.¹² In addition to attracting outside money into a local economy, industry benefits that community because the new (outside) dollar will change hands multiple times as it travels through the local economy. The cascading effect of this extra money in a locale multiplies the impact of each additional dollar. Experts in the field of economic development use multipliers to capture the value of each initial dollar created by new or expanded firms in an extended regional economy. These multipliers are commonly used to describe how a dollar travels through the regional economy.¹³

Regional economic simulation models use multipliers to forecast likely impacts of new policies given a set of assumptions about regional economic behavior, region-specific industry data, and transaction patterns. Many of these models benefit from or augment existing econometric research to provide a range of plausible assumptions for modeling economic behavior. Combining Bartik's consensus estimates of the elasticity of tax incentives related to economic development with estimates of manufacturing multipliers, for example, demonstrates one way these impact models can be used to inform decision-making.

To demonstrate the possible effects of tax policies that target the manufacturing sector, such as the M&E exemptions, we present two possible economic development forecasts using IMPLAN software. Tables 5 and 6 display the results of our analysis. This analysis decreases manufacturers' tax burden by \$50 million and then by \$20 million and

¹² Basic economies are comprised of industries that produce goods that exceed local demand, typical of manufacturing sectors, and thus add new dollars to the region. This falls under the discussion of export base theory. See Appendix D for a more detailed discussion of export base theory.

¹³ For more discussion, refer to Appendix D.

simultaneously “shifts” the burden of this tax to households.¹⁴ Government services are unchanged in this analysis—effectively imitating the expected behavior of the property tax in the short term. In Table 5, we assume that by lowering taxes, new economic activity is created within the state using the elasticity of (-0.2). Table 6 shows the results for a greater elasticity of (-0.3).¹⁵

The traditional indicators of economic output—total production (output), employment, and value-added—are listed along the top of each table.¹⁶ These indicators are broken down into the types of effect that the tax abatement will have on the economy, including direct, indirect, and induced. Direct effects represent the response or change resulting from the change in final demand across Wisconsin. Indirect effects represent the response by the economy, or the change in demand necessary to accommodate industry purchasing from these direct effects. Induced effects represent the response by all industries in Wisconsin that results from the change in demand due to consumer income. The amount of the hypothetical tax incentive for each IMPLAN scenario (\$20 million or \$50 million) is indicated along the side of the table.

Table 5			
Economic Response to Tax Decrease - Elasticity of (-0.2)			
(\$ millions)			
\$50 million decrease	Output	Employment	Value-Added
Direct	\$278.7	2,029	\$125.9
Indirect	\$96.0	1,045	\$49.1
Induced	\$86.5	1,107	\$50.3
Total	\$461.2	4,181	\$225.3
\$20 million decrease	Output	Employment	Value-Added
Direct	\$111.5	812	\$50.4
Indirect	\$38.4	418	\$19.6
Induced	\$34.6	443	\$20.1
Total	\$184.5	1,673	\$90.1

Source: Minnesota IMPLAN Group Inc. (data and software), 2001.

¹⁴ For this analysis, manufacturers are identified by a one-digit Standard Industrial Classification code.

¹⁵ While these elasticities were originally intended to reflect the total impact of tax incentives (direct, indirect, and induced), we used them as the determinant for direct effects only, reflecting lack of explicit treatment in literature.

¹⁶ Value-added loosely defines production income less cash costs for input. IMPLAN specifically includes employee compensation, proprietary income, and indirect business taxes in its calculation of “value-added.”

Table 6			
Economic Response to Tax Decrease - Elasticity of (-0.3)			
(\$ millions)			
\$50 million decrease	Output	Employment	Value-Added
Direct	\$443.1	3,228	\$197.2
Indirect	\$147.1	1,603	\$75.3
Induced	\$134.7	1,724	\$78.4
Total	\$724.9	6,555	\$350.9
\$20 million decrease	Output	Employment	Value-Added
Direct	\$177.2	1,291	\$78.9
Indirect	\$58.8	641	\$30.1
Induced	\$53.9	689	\$31.3
Total	\$289.9	2,621	\$140.3

Source: Minnesota IMPLAN Group Inc. (data and software), 2001.

These tables demonstrate the importance of elasticity—initial firm location and investment behavior in response to taxation—in determining the economic value of tax incentives such as the M&E exemptions. Although the elasticities in the first and second table differ by only one-tenth, all three indicators of economic activity are different from one another. Even within this generally accepted range of elasticities, then, policymakers may reach vastly different conclusions about the impact of tax incentives. Reasonable policymakers may question the degree to which a relatively small change in tax revenue intake, say \$20 million, may directly induce large multiples of total economic activity that would not have occurred absent the incentive. Equally reasonable policymakers may be more concerned that small changes in taxation will cause disproportionate flight. Thus, relaxing, restricting, or adding additional assumptions within the IMPLAN model, while important to consider, are secondary to considerations of basic economic impact as measured by elasticity.

To provide perspective of the magnitude of the hypothesized impact of a tax decrease, Table 7 indicates the percent increase in Wisconsin's output, employment, and value-added due to the tax change. Of the reported impact to output, employment, and value-added, the benefit comes from potential firm attraction—completely new activity—and not the immediate wealth effects of incumbent firms.

Table 7 Impact of a Tax Decrease to Manufacturers on Wisconsin's Economic Activity Using Economic Data from 2001¹⁷						
Tax Decrease	Output	Percent of WI Output	Employment	Percent of WI Employment	Value-Added	Percent of WI Value-Added
Elasticity of (-0.2) ¹⁸						
\$50 million	\$461.1	0.25%	4,181	0.12%	\$225.3	0.19%
\$20 million	\$184.5	0.10%	1,673	0.05%	\$90.1	0.08%
Elasticity of (-0.3)						
\$50 million	\$725.0	0.40%	6,554	0.19%	\$350.9	0.30%
\$20 million	\$290.0	0.16%	2,621	0.08%	\$140.3	0.12%
Wisconsin Output (2001): 183,055 Wisconsin Employment (2001): 3,418,677 Wisconsin Earnings By Place of Work (2001): \$118,830 million						

Source: Bureau of Economic Analysis, SA30 State economic profiles – Wisconsin; and Minnesota IMPLAN Group Inc (data and software), 2001

¹⁷ Figures are represented in 2001 dollars (most recent data available in IMPLAN).

¹⁸ Direct effect elasticity. Indirect and induced effects are ignored.

IMPLAN Model: Assumptions

IMPLAN relies on a number of assumptions about the behavior of firms, markets, and households. To examine Wisconsin's M&E exemptions, we need to make a number of additional assumptions. Each of these assumptions affects the magnitude and the direction of our findings; some inflate their value while others make them smaller. On balance, the set of assumptions we selected errs on the side of a larger, rather than a smaller estimate. Each respective assumption may not be a considerable factor, but taken together, we expect that our overall impact estimates are likely overstated for a number of reasons: firms may choose to purchase fewer inputs in-state than expected; the model may not fully account for in-migration of labor; the range and values of multipliers are estimates; the analysis treats Wisconsin as a homogenous whole; the timeframe for full impact is likely too short; and household income loss or reduction of government service may affect firm decision-making. The remainder of this section outlines each of these assumptions in turn.

The assumptions inherent in IMPLAN and input/output models embody a complex set of firm output, investment, and employment decisions rooted in economic theory, regional purchase tendencies, inter-industry margins, and consumption and production functions. However, they are not infallible. Some error may come from the assumption of how much firms are expected to purchase and sell locally. If a firm decides to purchase all of its inputs out of state, for example, indirect and induced effects may be overstated.

Additionally, IMPLAN's model of Wisconsin's economy may not fully account for all of the state's special characteristics. Wisconsin's political boundaries, for example, may not adequately represent close ties to the labor and product markets of the region. Thus, IMPLAN may underestimate labor and firm mobility within the Upper Midwest. With firm and labor mobility, the benefit of Wisconsin tax abatements that accrue to Wisconsin citizens becomes less clear. A 1991 study of new jobs estimates that 77 percent of new hires will come from out of state, while only 23 percent will come from resident employees who are unemployed or out of the workforce (Bartik, 1991). Labor in-migration may be even more prevalent under conditions of full employment, and thus should be accounted for when producing and evaluating such models.

Other assumptions also influence how simulation results are presented. In Wisconsin, for example, there are a wide range of multipliers within the various manufacturing sectors.¹⁹ This variation means that we can be more certain of manufacturers' effects on the broader Wisconsin economy than their effects on specific industries or areas. That is, all exemptions to all firms are not equal. Tax credits for crop farming, for example, will have lower multipliers (1.583) and consequently, lower yields of economic output per tax dollar than food processing (5.207) all else equal (See Appendix D, Table 11).

In this analysis, we treat the state of Wisconsin as a homogenous whole. In reality, it is very likely that additional economic development will help some localities more than others, some firms more than others, and some households more than others.

¹⁹ Appendix D, Table 11 shows a variety of multipliers across Wisconsin industries.

Any resulting tax shift or change in government service will also be distributed unevenly among locations, firms, and households. In addition, the extent to which firms decide to initiate new business activity within Wisconsin as a result of the incentive is an important intermediary in determining ultimate economic impact. Thus, the rate at which incentive money translates to a catalyst for new economic activity has a great impact on the economic development value of the incentive.

Our IMPLAN impacts are assumed to occur within one year. The immediacy of this assumption may overstate the impact estimates. Phasing in a benefit over a number of years and creating a discounted benefit stream might be a more appropriate strategy for future models. More importantly, perhaps, from a modeling standpoint, is the notion that economies are often self-correcting and “impact nullifying” over time; a region attracting business by offering cheaper labor, by virtue of its attractiveness makes labor more expensive, and subsequently less attractive.

Most importantly, it is likely that this analysis underestimates the effects of a tax shift to households or a reduction in government service. IMPLAN reports both household income loss and service reduction at face value. However, while IMPLAN’s calculation of service reduction includes an additional loss of employment and a reduction in local consumption and sales income for many businesses, offsetting disincentives that this may have on firm location are ignored. If government service reductions result from tax incentives, Wisconsin could become marginally less attractive for businesses in both the manufacturing and non-manufacturing sectors. Service reductions, for example, may lower quality of life in the state and inhibit a firm’s ability to attract and retain skilled workers.

IMPLAN Model: Application

The economic development impacts that result from our “reasonable range” of elasticities alone are modest. In terms of employment, our initial sketch of elasticities indicated an annual cost (in revenue shifted or forgone) of approximately \$5,600 per job created. During a period of ten years, this cost per job totals a net present value of about \$50,300.²⁰ On further investigation, we find these initial calculations to be optimistic. Our more refined IMPLAN estimate places the minimum annual cost per job between \$6,200 and \$10,600—a net present value of \$55,700 to \$95,200 per job.²¹ This estimate represents a best-case scenario. Taking all these assumptions into account, (e.g. direct effect elasticity, one-year impact, and most importantly, discounting of location disincentives as a result of service cuts or tax shifts) makes the effects weaker and costs higher.

²⁰ Ten years at discount rate of 2 percent.

²¹ Cost per job is determined using data from Table 6 and the data outlined in Figure 1: (Annual fiscal impact)/(Jobs created) – (Annual tax revenue per job). For example, (\$50 million/4,181) – \$1,400 = \$10,600.

Equity—Tax Incidence

Examining the extent to which a proposed tax is equitable, or fair, is the second component of this framework. In tax analysis, equity is generally considered in relation to both individuals and businesses. Additionally, equity is often evaluated using the “ability to pay” principle or the “benefit” principle. As its name suggests, the “ability to pay” principle indicates that tax burdens “should be distributed among households according to their ability to bear them” (Tannenwald, 2004). This principle is often discussed in tax policy literature in terms of tax incidence, which describes the individuals or businesses that pay for, or bear the burden, of a tax. Wisconsin DOR’s 2004 *Wisconsin Tax Incidence Study* presents a comprehensive evaluation of the state’s taxes in terms of ability to pay and tax incidence (DOR, 2004). The “benefit” principle suggests that tax burdens “should reflect the distribution of benefits conferred by governmental services” (Tannenwald, 2004).²² According to this principle, all recipients of public services should pay taxes for the services they receive. Using the “ability to pay” and “benefit” principles as a guide, we evaluated the equity of Wisconsin’s M&E exemptions.

When considering “ability to pay,” we drew from the findings of the *Wisconsin Tax Incidence Study* to analyze the impact of the M&E exemptions on individuals and business sectors in Wisconsin. According to the study, the incidence of Wisconsin’s sales tax paid by businesses in the manufacturing sector falls primarily on laborers in the form of lower wages (DOR, 2004).²³ The remaining portions of the tax are borne by consumers in terms of higher prices and by business owners in the form of lower profits. Because the M&E sales tax exemption lowers the amount of sales tax paid by manufacturers, it affects the incidence of the sales tax. Laborers’ wages are, therefore, higher with the exemption than they would be without it. In addition, prices of goods may be lower and business owners may earn slightly higher profits as a result of the exemption. These findings suggest that in terms of “ability to pay” the M&E sales tax exemption is a slightly progressive tax policy that increases wages and lowers prices. However, the technical challenges inherent in the measurement of tax incidence suggest that these findings should be considered strong assumptions at best.

Business owners, consumers, and laborers bear the incidence of the property tax manufacturers pay, just like the sales tax, the *Wisconsin Tax Incidence Study* indicates (DOR, 2004). By exempting certain manufacturing M&E from the property tax, these same business owners, consumers, and laborers presumably bear less tax burden than they would without the exemption. This finding, however, is complicated by the tax shift created by the exemption. As indicated earlier, in 2003 Wisconsin shifted approximately \$330 million in annual property tax revenue to individuals and other non-manufacturing businesses because of its M&E property tax exemption. Any tax exemption targeted toward manufacturing property would, therefore, increase property tax levies for

²² Although some experts argue that the “benefit” principle is easier to apply than the “ability to pay” principle when evaluating the equity of a business tax, this measure is complicated by tax shifts. Additionally, controversy exists regarding whether ability to pay should be determined using measures of income or consumption. For a more thorough discussion of the “benefit” principle see Tannenwald, 1996.

²³ The *Wisconsin Tax Incidence Study* considered regressive, plausible, and progressive variants of tax incidence. This paper discusses the plausible version of the incidence of the sales and property taxes.

individuals and non-manufacturing business sectors. As the property tax is traditionally considered to be a regressive tax, this shift translates into a marginally more regressive statewide tax burden (Fisher, 1996).²⁴

Using the “benefit” principle to evaluate equity, we considered whether manufacturers pay their fair share of taxes to support public services. Like all businesses, manufacturers use public services such as law enforcement, trash removal, and fire protection, and, presumably, they should help to pay for these services. By giving manufacturers preferential tax treatment, one could argue, though, that they pay less for the same public services as individuals and non-manufacturing businesses. In standard tax analysis, paying less than other business sectors could be construed as a breach of horizontal equity, which suggests that individuals or businesses with similar income should pay about the same amount in taxes. Several other factors should be considered, however, before concluding that Wisconsin manufacturers do not pay their fair share of taxes according to the benefit principle. Non-manufacturing businesses may receive preferential tax treatment that does not apply to manufacturers, or manufacturers may use fewer public services than individuals or non-manufacturing businesses. Thus, the information discussed in this section is only a cursory analysis of the equity of the M&E exemptions and an example of how the “ability to pay” and “benefit” principles can be applied in the analysis of other tax policies.

Efficiency

Our framework continues by evaluating the economic efficiency of the M&E exemptions. Efficient tax policies are those that have as small an impact as possible on the economic behavior of individuals and businesses. These policies generate little excess burden, which is “the burden over and above the revenue generated” from the tax, because they have low rates and broad tax bases (Fisher, 1996). In addition, efficient policies often have a negligible impact on the decisions of individuals and firms. Public finance experts typically promote efficient policies and use efficiency as a key component of tax policy evaluation.

The efficiency of the M&E exemptions can be evaluated from three perspectives: (1) by considering the impact of the exemptions on the purchasing decisions made by manufacturers; (2) by considering the impact of the exemptions on manufacturers’ decision to operate in Wisconsin and the “cost” associated with each new job created because of this decision; and (3) by considering the impact of collecting personal property taxes on some but not all industries.

Because the M&E exemptions apply only to personal property used “directly and exclusively” in the manufacturing process, one might expect businesses to invest more heavily in this type of property than in taxable personal property that has broader

²⁴ The *Wisconsin Tax Incidence Study* found the property tax to be regressive across all Wisconsin household groups, although it is less regressive for renters than for property owners. The study also found that, when utilized, the Homestead Tax Credit significantly reduces the regressivity of the property tax. The long-standing opinion that property taxes are regressive is based on the assumption that these taxes operated as excise taxes on commodities (e.g. housing as a commodity). In contrast, “new” property tax analysis considers a portion of property taxes to be taxes on capital and thus, often, finds property taxes to be proportional or marginally progressive (Fisher, 1996).

application in a business enterprise. Such a change in business behavior would suggest that M&E exemptions generate excess burden and are, like most taxes, somewhat inefficient. However, how significant is the excess burden created by this change in behavior? Presumably, the types and amounts of equipment manufacturers need to produce their products are constrained by the type of good produced and the technology available to aid production. Thus, it is unlikely that manufacturers are able to substitute exempt equipment for taxable equipment with any regularity. That is, it is unlikely that the amount of excess burden created by this behavior change is substantial.

Efficiency can also be evaluated by examining the impact of these exemptions on the location behavior of manufacturing businesses. For example, do the M&E exemptions encourage startups or expansions in Wisconsin's manufacturing sector? If so, how costly are the new jobs that are created as a result of the exemptions? As discussed in the literature review section of this report, tax treatment is only one factor in the complex decisions of firm location and expansion, regardless of business sector. On the margin, however, tax treatment can be the factor that tips a business's decision in favor of one state over another. Thus, one can assume that, all else equal, M&E exemptions might represent a "tipping point" in favor of Wisconsin. This is not to say that these exemptions provide enough incentive for an entrepreneur to substitute a manufacturing business idea for a business idea in another industry; it is simply to point out that the M&E exemptions provide extra incentives to new and expanding manufacturers.

When these exemptions are indeed the "tipping point" in a business decision, their efficiency can be evaluated by calculating the approximate "cost" of new manufacturing jobs. According to the output from IMPLAN, \$50 million in foregone tax revenue creates between 4,200 and 6,500 new jobs in Wisconsin. This translates into an annual cost of \$6,200 to \$10,600 per new job created.²⁵ Because the sales tax exemption leads to more than \$50 million in annual forgone tax revenue, the cost per job is likely greater. Is a policy that creates new jobs at an annual cost of \$6,200 efficient? Without comparing this amount with the cost per job created by other tax policies in Wisconsin, this question is difficult to answer.

These exemptions also influence the behavior of firms that do not benefit from them (non-manufacturing firms). Economic theory indicates that tax rates (or payments) might be reflected in the price of goods sold by businesses in higher tax sectors. That is, when possible, businesses essentially "pass on" these higher tax rates to individual consumers. Little conclusive evidence exists, however, to confirm the extent to which higher tax rates affect non-manufacturing firms and consumers. Instead, these impacts likely vary significantly by industry.

This section has evaluated the efficiency of the M&E exemptions by examining the influence that the exemptions have on manufacturing and non-manufacturing firms' business decisions. These same methods of evaluation can be applied to other tax policies.

²⁵ The figure of \$6,200 per job, the absolute minimum cost estimate, considers the direct, indirect, and induced benefits of the job and the extra taxes paid by new workers.

Administrative Costs

An examination of the administrative costs associated with implementing and monitoring a proposed tax policy completes our framework for evaluation. The cost of administering a tax policy typically does not impact that policy's ability to provide tax relief or stimulate economic development. Administrative costs, however, may detract from the aggregate benefits associated with a policy and, therefore, should be considered when evaluating new and existing tax policies. The benefits of a policy with particularly high or burdensome administrative costs, for example, should outweigh the costs of administering that policy (Olin, 2000). In the case of tax policies such as the M&E exemptions, which are intended to stimulate economic development and presumably generate tax revenue, it is especially important for benefits to outweigh costs.

A policy's administrative costs can be evaluated by comparing them directly to its benefits or as a component of a more comprehensive cost-benefit analysis. Each of these approaches begins with a calculation of the annual costs associated with administering the policy. In the case of Wisconsin's M&E exemptions, salaries and benefits of DOR's assessment staff represent the majority of the policy's administrative costs. According to a recent report produced by the Wisconsin Legislative Audit Bureau, in the 2003–2004 fiscal year, these costs equaled approximately \$2.8 million (LAB, 2004).²⁶ Other administrative costs associated with the M&E exemptions can be categorized as opportunity costs as they limit the time DOR employees can spend on other responsibilities. These opportunity costs include the time associated with preparing, reviewing, and auditing M-P tax forms and time spent preparing the biennial estimate of the exemption. Arguably most of these administrative costs are inherent in evaluating manufacturer's taxable property and would exist in the absence of exemptions for M&E. Also, in the case of Wisconsin's M&E exemptions, the administrative costs are relatively small when compared with the plausible range of economic benefits outlined in this report's section on the "Impact of the M&E Exemption Policy on Economic Development." However, this is not the case for all tax incentives; some could have significant administrative costs. In the case of tax incentives with administrative costs that are particularly high in relation to benefits received, DOR may wish to consider eliminating the incentive or administering the incentive in a more cost effective manner. Technology and process improvements could help to reduce administrative costs, for example. While our research does not suggest any benchmarks to use when making this comparison or applying these alternatives, decision-makers should typically expect a policy's administrative costs to be relatively small when compared to its benefits.

²⁶ The Legislative Audit Bureau indicated in its report that the DOR's Bureau of Manufacturing and Telco Assessment has 41.5 full-time equivalent employees. Of this amount, 4.7 are dedicated to Telco assessment, therefore, the cost of salaries associated with manufacturing assessment is probably less than \$2.8 million.

Conclusion

All states strive to remain economically competitive. Failure to be competitive may risk needed jobs and revenue vital to the health of their economies. Likewise, being too aggressive with business tax incentives may sacrifice revenue, thereby placing a greater tax burden on other taxpayers and risking the quality or quantity of public service demanded by the public and businesses in the state. While the analysis in this report does not definitively resolve these issues, it does establish a framework for evaluating current and future policies. Our framework consists of four broad categories of analysis: economic development value, equity, efficiency, and administrative costs.

Applying this framework to the M&E exemptions provides a better understanding of the effectiveness of this incentive as well as the tradeoffs that need to be considered when evaluating it. However, the interpretation of any such evaluation varies widely. For some, the \$6,200-\$10,600 estimated annual cost per job provides proof of a successful economic development policy. For others, this cost is too high. Tradeoffs like this one are not unique to the M&E exemptions—they are inherent to the application of all tax incentive policies; thus, we recommend caution when implementing new economic development incentives. In the end, we leave it up to the reader to decide the worth of the M&E exemptions.

The evaluative framework outlined in this paper is designed to give policymakers tools to better understand the impacts of their decisions and allow them to carefully target policies to get the highest return for the lowest cost. When applying our framework of analysis to the M&E exemptions, several recommendations became evident:

- A. Set clear goals and metrics when enacting tax incentive policies.
- B. Consider short and long-term evaluations from the beginning.
- C. Target tax exemptions/incentives carefully to achieve the highest return.
- D. Evaluate policies holistically using all four framework categories.
If tradeoffs are made, take care to justify them.
- E. Consider Wisconsin's unique economic features to get the highest return.
Do not create policies solely on the basis of other states' actions.

While we do not expect that any policy will be able to fully satisfy each criterion presented in our framework, our efforts to estimate and evaluate the M&E exemptions demonstrate that it is both feasible and worthwhile to conduct such an analysis. We conclude by proposing that all tax incentive policies (new and ongoing) be analyzed using the aforementioned framework so that policy-makers can be explicit about the goals, costs, and priorities they choose to make.

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Appendix A: Summary of Literature

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
Trends in State Business Incentives: More Money and More Accountability	LeRoy, Greg, director of Good Jobs First	2004		Trends in state spending for economic development	National	<ul style="list-style-type: none"> States are spending more money to entice companies, measured in per job amounts Tax expenditures are typically unaccountable due to transparency, lack of auditing, and loss of budget control There is a growing shift toward accountability 	<ul style="list-style-type: none"> Provides good overview of state incentives for economic development Gives dollar amount for how much cities and states spent on economic development Evaluates spending on a per job basis
Impact of Tax Exemptions: An Overview	Steven Lerch, Washington State Institute for Public Policy	2004		Impact of state and local tax exemptions	Washington	<ul style="list-style-type: none"> Each approach to measuring the impact of tax exemptions on economic activity has advantages and disadvantages Taken as a whole, the research suggests that state taxes and tax incentives can have an impact on economic activity 	<ul style="list-style-type: none"> Studies a variety of tax exemptions and concludes that their impact may be weakened or strengthened by the design of tax incentive programs or a state's business tax burden relative to other states The economic impact of tax exemptions is likely to be small and less important than other factors, such as labor costs and productivity

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
Jobs in the Millennium - WI Regional Economies 1999-2003	Sammis White, University of Wisconsin-Milwaukee	2004	1999-2003	Jobs in Wisconsin	Wisconsin	<ul style="list-style-type: none"> • Wisconsin lost more than 85,500 manufacturing jobs from 1999-2003 • Manufacturing was 19 percent of all employment in Wisconsin (though this has been reduced a bit in the last year) • Average earnings per worker in manufacturing rose more than 9 percent from 1999-2003 	<ul style="list-style-type: none"> • Includes breakdown of employment totals and changes by industry, location, etc. • Uses data from Department of Workforce Development, Department of Administration, Bureau of Labor Statistics for nine areas of state. Uses NAICS codes • Data on: Labor force demographics by region, state; and regional employment by industry; employment change by industry • Specific discussion of manufacturing
Michigan's Renaissance Zones: Eliminating Taxes to Attract Investment and Jobs in Distressed Communities	Gary Sands	2003		Evaluation of renaissance zones, which are virtually tax free	Michigan	<ul style="list-style-type: none"> • Renaissance zones had more success retaining business than attracting new business • Most zones had some growth in business and jobs 	<ul style="list-style-type: none"> • Specific analysis of a single state • Used surveys to compile results
Is the Tax Expenditure Concept Still Relevant?	Leonard E. Burman	2003		Tax expenditure measurement	National	<ul style="list-style-type: none"> • Tax expenditures are useful ways of showing how government affects the allocation of resources directly — by financing public activities via tax concession—and indirectly, by altering after-tax prices and thus distorting the allocation of resources. • Savings subsidies in the context of a hybrid income-consumption tax system can create substantial resource misallocations 	<ul style="list-style-type: none"> • Qualitative examination of federal tax policies, especially with relation to tax expenditures.

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
Economic Development Incentive Wars: What Influence Do State and Local Economic Development Incentives Have on Location Decisions of Firms?	Chris Lockie	2002		State and local business development incentives	National	<ul style="list-style-type: none"> • It is incredibly difficult to measure tax incentive and economic development policies • Econometric studies show some relationship between presence of incentives and economic development spending on employment growth but the relationships are small and inconsistent. 	<ul style="list-style-type: none"> • Discussion of efficacy of economic development incentives and four common methods of assessing them • Recommends policy reforms given the difficulty of studying economic development incentives
The Effect of State Economic Development Incentives on Employment Growth of Establishments	Todd Gabe and David Kraybill	2002	1993-1995	State economic development incentives on manufacturing and non-manufacturing firms	Ohio	<ul style="list-style-type: none"> • Incentives have little or even a negative effect on actual growth • Incentives have a substantial effect on announced growth 	<ul style="list-style-type: none"> • Studies the effect of state economic development incentives on 366 Ohio firms in the manufacturing and the non-manufacturing sectors between 1993 and 1995
Conducting an Analysis of Georgia's Economic Development Tax Incentive Program	Keith R. Ihlanfeldt and David L. Sjoquist	2001		Impact of income tax credits in Georgia (tax known as BEST)	Georgia	<ul style="list-style-type: none"> • Policy could be more effective because it only applies to income tax liability, and more than 75 percent of firms have no income tax; all new jobs receive same credit regardless of type of job; a number of other problems were listed as well 	<ul style="list-style-type: none"> • Discusses framework for analysis • Primarily focuses on a job tax credit
An Evaluation of the Effectiveness of Louisville's Enterprise Zone	Lambert, Thomas E. and Coomes, Paul A.	2001		Louisville's enterprise zones	Kentucky	<ul style="list-style-type: none"> • Enterprise zones were not successful in creating new jobs and attracting business • Difficult to evaluate success (or lack of) in enterprise zones due to competing economic development programs and other factors 	<ul style="list-style-type: none"> • Provides good methodology for evaluating a tax incentive program, including metrics evaluated and limitations

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
The Effect of State Tax Incentives on Economic Growth and Firm Location Decisions: An Overview of The Literature	Terry Buss	2001		Literature review of studies on the relationship among taxes and economic growth	National	<ul style="list-style-type: none"> • Studies yield conflicting results • Tax studies offer little guidance to policymakers concerned about fine-tuning tax rates and using tax incentives as economic development tools 	<ul style="list-style-type: none"> • Recommends constructs to keep in mind in performing cost-benefit analyses of economic development policies • Examines current academic literature on the issue
Urban Enterprise Zones: Do They Work? Evidence from New Jersey	Marilyn Rubin	2001		Cost effectiveness evaluation of urban enterprise zones in New Jersey	New Jersey	<ul style="list-style-type: none"> • Found urban enterprise zone credits to be cost effective • Cautioned that rapid economic growth during the time period may have affected results 	<ul style="list-style-type: none"> • Used input/output model to determine policy benefits; compared benefits with policy costs
Incentives: Good Business Practice of Bad County Policy?	Kevin Wilcox	1999		Incentives localities use to encourage business development	National	<ul style="list-style-type: none"> • Most common tax incentives are, in order, property tax, income or franchise tax, sales tax, job training, preferred financing, employment of payroll tax credits, or utility rebates 	<ul style="list-style-type: none"> • Descriptive and normative discussion of business tax incentives
Do Business Tax Incentives Contribute to a Divergence in Economic Growth?	J.M. Phillips and E.P. Goss	1999		Evaluates business tax incentives across Nebraska	Nebraska	<ul style="list-style-type: none"> • Qualifying business tax investment had a statistically significant impact on economic growth for low-unemployment counties, no statistically significant impact for high-unemployment counties, and tended to be undertaken in areas with historically higher investment 	<ul style="list-style-type: none"> • Example of assessing tax policy using data amassed by a state department of revenue

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
The Effect of Taxes on Economic Development	Stephen Mark, Therese McGuire, and Leslie Papke	1998		Review of economic policies in the Washington, D.C., metropolitan area	D.C. metropolitan area	<ul style="list-style-type: none"> Economic effect of taxes tends to be both small and less important than other factors, including labor force availability and quality The way tax revenues are spent is important Cutting taxes to induce economic growth is unlikely to be efficient or cost-effective 	<ul style="list-style-type: none"> Studies economic tools currently used in the D.C. metropolitan area
Industrial Incentives: Competition Among American States and Cities	Peter S. Fisher and Alan H. Peters	1998		Tax incentives and economic development	National	<ul style="list-style-type: none"> Investigates the actual value of economic development incentives to firms in 24 states 	<ul style="list-style-type: none"> Measures the value of competitive incentives to typical manufacturing firms Examines incentives for the differences they make to the income of firms
Principles of Tax Policy and Targeted Tax Incentives	David Brunori	1997		Efficacy of tax incentives	National	<ul style="list-style-type: none"> Targeted tax incentives violate established principles of sound tax policy 	<ul style="list-style-type: none"> Considers tax policy under traditional constructs of revenue growth, equity, administrative efficiency, and accountability Skeptical of tax incentives
The Effects of State and Local Public Policies on Economic Development: An Overview	Katharine L. Bradbury, Yolanda K. Kodrzycki, and Robert Tannenwald	1997		State and local business development incentives	National	<ul style="list-style-type: none"> Policies pursued by subnational governments do affect the pace of economic development within states These effects are generally modest Evidence is inconclusive about which policies exert the greatest effects and under what circumstances 	<ul style="list-style-type: none"> Reports results of the Federal Reserve Bank of Boston's 1996 symposium to examine and critique existing theoretical and empirical evidence concerning effectiveness of state and local tax, spending, and regulatory policies as instruments of economic development

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
Taxation and Economic Development: The State of the Economic Literature	Michael Wasylenko, Timothy J. Bartik; Harley T. Duncan; Therese J. McGuire	1997		Elasticity estimates for state and local policy	National	<ul style="list-style-type: none"> Elasticity of economic decisions with relation to taxes Reviews of econometric and other empirical studies 	<ul style="list-style-type: none"> Provides elasticity estimates for economic development policies Provides conceptual framework and caveats in using these estimates
The Effects of State and Local Public Services on Economic Development	Ronald C. Fisher	1997		Efficacy of tax policy on economic development	National	<ul style="list-style-type: none"> Summarizes the literature of relationship between government spending and economic development 	<ul style="list-style-type: none"> Surveys economic development and growth effects of transportation, public safety, and education spending and services Studies relationship between public capital and national productivity
State Business Tax Climate: How Should It Be Measured and How Important Is It?	Robert Tannenwald, Federal Reserve Bank of Boston	1996	1991	Impact of tax structure on business climate; and measuring "manufacturing climate"	Massachusetts and northeast United States	<ul style="list-style-type: none"> Business tax climate exerts only a small, highly uncertain effect on capital spending States may be more likely to stimulate their economies by enhancing public services that businesses value Indicators of tax competitiveness should focus on taxes that most directly affect a firm's bottom line (during life of facility and to all levels of government) Comparative measure used: after-tax rates of return (AFTAXs); five "most competitive" states: Alabama, Maryland, South Carolina, Florida and New York 	<ul style="list-style-type: none"> Outlines analytic framework for weighing tax competitiveness from view of profit-maximizing business executive who is weighing sites for a new facility (regression) Critiques "representative firm approach" Mentions existing studies of tax competitiveness Describes method for determining state's average property tax burden

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
Business Climate and The Role of Development Incentives	Brian Dabson, Carl Rist and William Schweke for the Federal Reserve Bank of Minneapolis	1996		Efficacy of economic development policies	National	<ul style="list-style-type: none"> Identifies five key components of a positive business climate 	<ul style="list-style-type: none"> Provides a qualitative and general theoretical discussion
Where We Stand - 1996: Business Tax Competitiveness among the Great Lakes States	James A. Papke	1996		Comparative taxation and impact on economic development	Upper Midwest	<ul style="list-style-type: none"> Intraregional tax cost differentials imposed on domestic companies by diverse tax systems are relatively small Competition for capital investment by neighboring states does not necessarily result in differences in business taxation levels 	<ul style="list-style-type: none"> Discusses ways to measure interjurisdictional business tax differentials Studies disparity between level of business taxation and economic growth rates
The Effect of State and Local Taxes on Economic Development: A Meta-Analysis	J.M. Phillips and E.P. Goss	1995		Elasticity estimates for state and local policy	National	<ul style="list-style-type: none"> Derives more precise estimates of tax elasticity Determines how inclusion and omission of key variables influences estimates 	<ul style="list-style-type: none"> Builds on Bartik's analysis by statistically analyzing results across empirical studies
Analyzing a Proposal to Ban State Tax Breaks to Businesses	Thomas J. Holmes	1995		Whether overall welfare of the United States would increase if there were a federal law	National	<ul style="list-style-type: none"> Making tax breaks illegal could increase the summary measure of total welfare in the economy 	<ul style="list-style-type: none"> Would spread the tax burden more evenly and reduce the dead weight loss per dollar Efficient pattern of industry locations

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
How Would You Know a Good Economic Development Policy if You Tripped Over One? Hint, Don't Just Count Jobs	Paul N. Courant	1994		Efficacy of economic development policies	National	<ul style="list-style-type: none"> • Economists should direct more effort to evaluating the potential for improving economic welfare as distinct from measuring the consequences • Jobs are not coterminous with benefits 	<ul style="list-style-type: none"> • Provides research areas to consider when analyzing a state or local economic policy
Do State Business Climates Still Matter? Evidence of a Structural Change	Robert Carroll and Michael Wasylenko	1994	1967-1988	Effect of state and local fiscal variables on income and employment growth	National	<ul style="list-style-type: none"> • State/local fiscal variables (policies) had a larger effect in the 1970s than they did in the 1980s • Fiscal variables had little effect on non-manufacturing industries in either decade 	<ul style="list-style-type: none"> • Suggested reasons for change: (1) state specific factors became less important relative to differences among countries (globalization) (2) after 1983, downsizing in manufacturing happened across all states, not just high tax states
Jobs, Productivity, and Local Economic Development: What Implications Does Economic Research have for the Role of Government?	Timothy J. Bartik	1994		Efficacy of economic development policies	National	<ul style="list-style-type: none"> • Financial and tax subsidies have high cost per job created • Benefits large enough to justify costs are more likely in economically distressed areas • Newer economic development policies need assessment 	<ul style="list-style-type: none"> • Productivity-oriented services may make sense for low and high unemployment areas • Applies economic theory to study efficacy of economic development policies

Title	Author - Affiliation	Year Written	Year Analyzed	Focus (subject)	Focus (Location)	Key Points/Conclusions	Reader Comments
Who Benefits From State and Local Economic Development Policies?	Timothy J. Bartik	1991		State and local economic development policies	National	<ul style="list-style-type: none"> • Economic development policies can significantly affect the growth of a state or metropolitan area and benefit the unemployed • Faster growth means occupational upgrades 	<ul style="list-style-type: none"> • In-depth consideration of economic development policies and their impact at the state and local level
Measuring Differential State-Local Tax Liabilities and Their Implications for Business Investment Location	James A. Papke & Leslie E. Papke	1986		Impact of state and local tax differentials on industrial growth and location	National	<ul style="list-style-type: none"> • Business tax cost differentials exist at various locations both within and among states • Tax differentials may be an important location factor 	<ul style="list-style-type: none"> • Dated study but surveys evidence to support the conclusion that tax differentials matter
The Effect of State and Local Taxes on Economic Growth: A Time Series-Cross Section Approach	Jay Helms	1985	1965-1979	Effect of taxes (increases) on economic growth	National	<ul style="list-style-type: none"> • Taxes affect economic growth; how depends largely on what the revenues are used for • When tax revenues fund increased public services, they can encourage economic growth (benefit tax) • When tax revenues fund state transfer payments, they slow economic growth (redistribution is more effective at federal level) 	<ul style="list-style-type: none"> • Time series regression of sample from 48 states (1965-1979) • Looks at spending and revenues

Appendix B: Other States' Treatment of M&E²⁷

Different states have vastly different taxation regimes. Some states levy property taxes at the state level, while others levy only on a local level. Other states levy a combination of both. Given these different regimes, policies on M&E property tax exemptions also vary widely, and it is somewhat difficult to make generalizations across the states. To obtain as accurate a picture as possible, we surveyed all state departments of revenue and researched relevant statutes. As of March 4, 2005, sixteen states had replied to our survey. Our survey responses are compiled in Table 8, and our statutory research is compiled in Table 9.

Going into this research, we assumed that the states were likely to have similar if not identical taxation policies with regard to M&E. Logically, this assumption makes sense; if one state has more favorable tax treatment toward manufacturers, it is likely that manufacturers will try to obtain that benefit. In practice, however, different states have a wide array of policies, which likely reflect the differing economies of the state and different needs of the manufacturers.

Thirty-eight states tax manufacturing M&E the same way they tax other personal property in the state, although the specific policies differ among these states. Rhode Island, for example, explicitly does not exempt M&E from its property tax. Virginia taxes M&E only on the local level. States such as South Dakota, Pennsylvania, Texas, and Tennessee do not levy statewide property tax against personal property. M&E is subsumed in this general policy of nontaxability.

Many states also provide other types of favorable treatment for M&E. Florida, for example, levies taxes only on the local level and has a statute permitting the localities to pass referenda exempting M&E from taxation. West Virginia taxes M&E but at a lower rate than other personal property. Missouri taxes manufacturers under the slightly preferred rate that merchants receive.

The M&E taxation policies are more comparable among the Midwestern states. Iowa and Minnesota both exempt M&E from their property tax. Minnesota taxes some utility property, but by and large, M&E is not taxed. Iowa phased out its M&E property tax in 1996 during a five-year period. Iowa, however, has been and will continue to provide replacement funding for about eight years. Illinois's policy has a slight variation: although M&E has not been taxed under the property tax since 1979, it is subject to a personal property replacement tax. The personal property replacement tax is a corporate income tax that is collected by the department of revenue but distributed to local governments. M&E is still subject to property tax in Ohio, but it may be phased out during the next two years.²⁸

Other states that specifically exempt M&E from the property tax include Connecticut, Delaware, Kansas, Louisiana, Montana, Oklahoma, and South Carolina.

²⁷ A number of researchers have looked into this issue. Our research counts states with M&E exemptions only if the states fully exempt M&E and treat M&E differently from other personal property in the state.

²⁸ According to the survey respondent, the governor proposed a two-year phase out in the new budget.

Table 8 - Survey Responses

State	Manufacturing M&E subject to property tax?	If yes, at what percent of full-market value is it assessed?	Manufacturing M&E subject to tax rates different from other types of property?	How does state provide relief to manufacturers through income tax credits or other means?	Any evaluation?	When was manufacturing M&E exempted?
Arizona	Yes	0.25	No	No	No, however, there is a proposal that may be considered by the legislature this year that would assess manufacturing personal property at 13 percent rather than the current ratio of 25 percent.	N/A
Delaware	No	N/A	N/A	N/A	N/A	N/A
Florida	Yes	Tangible personal property, including manufacturing M&E, is subject to the same valuation standard as real property—full market value (referred to as just value in the constitution and statute).	The tax rates on real and tangible personal property are the same.	Yes. Florida allows county and municipal governments, by a majority vote of the people, to exempt up to 100 percent of the tax on real property improvements and tangible personal property of new or expanding businesses. The exact exemptions are set by the government enacting the exemption. The exemption is only for the government's own tax levy.	Yes. Estimates are made for most exemptions from all taxes including property tax. For property tax exemptions, see page 141 of the Florida Tax Handbook at http://www.state.fl.us/edr/reports/taxhandbook/taxhandbook.htm	The local option economic development exemption was enacted in 1980.

State	Manufacturing M&E subject to property tax?	If yes, at what percent of full-market value is it assessed?	Manufacturing M&E subject to tax rates different from other types of property?	How does state provide relief to manufacturers through income tax credits or other means?	Any evaluation?	When was manufacturing M&E exempted?
Idaho	Yes	100 percent (of course that is based on current market value annually redetermined after consideration of depreciation).	Generally no. However, certain specialized taxing districts, like flood control districts, levy only on real property and there are certain other minor exceptions.	We have a state investment tax credit which may be swapped for a property tax exemption for qualifying equipment under certain (loss) income circumstances.	Yes — we have detailed analyses of various personal property and industrial property tax exemption impacts, although none are specific to “manufacturing.”	N/A

State	Manufacturing M&E subject to property tax?	If yes, at what percent of full-market value is it assessed?	Manufacturing M&E subject to tax rates different from other types of property?	How does state provide relief to manufacturers through income tax credits or other means?	Any evaluation?	When was manufacturing M&E exempted?
Illinois	We do not tax machinery and equipment under the property tax. This occurred in 1979 and was replaced with a personal property replacement tax that is a corporate income tax that goes completely to local governments. One interesting outcome is that this income tax is counted as a state tax when the census categorizes taxes into local or state whereas the property tax would have been considered under the local tax category.	N/A	N/A	N/A	N/A	1979

State	Manufacturing M&E subject to property tax?	If yes, at what percent of full-market value is it assessed?	Manufacturing M&E subject to tax rates different from other types of property?	How does state provide relief to manufacturers through income tax credits or other means?	Any evaluation?	When was manufacturing M&E exempted?
Iowa	<p>In Iowa, property tax on machinery and equipment was phased out a number of years ago. The phase-out occurred during about five years with the state providing replacement funding for about eight years. Iowa has not done any evaluation of the economic impact of property tax exemptions. The phase-out of the tax on M&E began with fiscal year 1996. Beginning that year, any new M&E property was exempted from property tax. Then starting in fiscal year 2001, the tax on existing M&E property was phased out over a three-year period.</p>	N/A	N/A	N/A	N/A	1996, with five-year phase-in

State	Manufacturing M&E subject to property tax?	If yes, at what percent of full-market value is it assessed?	Manufacturing M&E subject to tax rates different from other types of property?	How does state provide relief to manufacturers through income tax credits or other means?	Any evaluation?	When was manufacturing M&E exempted?
Maine	Yes	Manufacturing M&E is assessed at the same percentage of value as all other property within that taxing jurisdiction.	Manufacturing M&E is assessed at the same rate as all other property within that taxing jurisdiction.	Maine' Business Equipment Reimbursement Program (BETR) reimburses most business machinery and equipment placed in service after April 1, 1995.	With respect to manufacturing machinery and equipment? Yes and no. We do not have a clean definition for property tax purposes as to just what types of property should be included as falling under "manufacturing machinery and equipment." We have made some attempts to measure local impacts, but do not have any clean figures to share.	N/A
Minnesota	No, with the exception of certain utility property.	N/A	N/A	Minnesota's main exemption is from sales tax on capital equipment.	Property tax exemptions are discussed in the Minnesota Tax Expenditure Budget http://www.taxes.state.mn.us/taxes/legal_policy/research_reports/research_reports.shtml .	Fully exempt in 1971
North Carolina	Yes, unless it is pollution control, waste recycling, or cotton dust abatement equipment.	M&E is assessed based on trended replacement cost minus depreciation.	No	Tax credits provided for a percentage of the cost of purchasing new equipment, but not specifically for the property taxes paid on the equipment.	No	N/A

State	Manufacturing M&E subject to property tax?	If yes, at what percent of full-market value is it assessed?	Manufacturing M&E subject to tax rates different from other types of property?	How does state provide relief to manufacturers through income tax credits or other means?	Any evaluation?	When was manufacturing M&E exempted?
Ohio	Yes, however in the state budget introduced this week, the governor proposes eliminating the tax over the next two years.	It is assessed at 25 percent of depreciated cost.	When a levy is passed in Ohio, the rate is the same on all types of property. However, over time, the rate on real property is rolled back to prevent inflationary increases. There is no such rollback on M&E, so the overall rate on M&E is higher.	We have investment tax credits on our corporate franchise tax for investment in M&E, but those credits are currently in question because of the ruling in the Cuno case.	We have looked at the impacts of eliminating the tax on M&E.	N/A
Washington	Yes. Machinery and equipment that is affixed to the structure is included in the value of the real property, which is determined by the county assessor. M&E that is moveable is listed annually with the county assessor and is taxed as personal property, generally based on the current fair market value.	Washington has no percentage classification system for different types of property. The goal of the valuation process is market value; however, for various reasons the assessed value is generally somewhat less. Based on annual ratio studies, the statewide average assessed value of real property is typically about 91 percent of fair market value and personal property is about 95 percent.	No	No	While not really an "evaluation," the department conducts periodic studies of all tax exemptions. A report issued every four years lists all exemptions for most major state/local taxes and provides an estimate of the amount of tax savings for taxpayers. (The report can be found at: http://dor.wa.gov under "Statistics and Reports").	N/A

State	Manufacturing M&E subject to property tax?	If yes, at what percent of full-market value is it assessed?	Manufacturing M&E subject to tax rates different from other types of property?	How does state provide relief to manufacturers through income tax credits or other means?	Any evaluation?	When was manufacturing M&E exempted?
West Virginia	Yes	60 percent, (except for qualified pollution abatement equipment, and molds, jigs, dies, and templates, which are assessed at roughly 3 percent. In addition, a certified capital addition of more than \$50 million to an existing industrial plant with an original cost of at least \$100 million also qualifies for the 3 percent assessment ratio.	No. (Rental property, all personal property, commercial property, and industrial property is taxed at double the rate imposed on owner occupied residential property.)	No, except for the exceptions mentioned.	Generally no.	N/A

Table 9 - Summary of State Statutes Relating to Manufacturing Machinery and Equipment Taxation

State	Exempt from Property Tax?	Relevant Statute, if Applicable	Summary Notes
Alabama	No	Al. Code § 40-14A-24(4)	M&E does not count toward net worth.
Alaska	No	Admin. Code, Tit. 8, Ch. 40	Regulation offering special treatment never implemented.
Arizona	No	n/a	
Arkansas	No	n/a	
California	No	n/a	
Colorado	No	Col. Rev. Stat. § 39-3-118.5	Business personal property exempted until used in business.
Connecticut	Yes	Conn. Gen. Stat. § 12-81(72)	M&E exempt for five years after acquisition.
Delaware	Yes	Del. Stat. Tit. 30 § 102	
Florida	No	Fl. Stat. § 196.1995	Localities permitted to exempt if they choose.
Georgia	No	Ga. Stat. § 48-5-41.1	
Hawaii	No	Haw. Stat. §§ 246-1& 246-4	
Idaho	No	n/a	State investment tax credit available in some circumstances.
Illinois	Yes	Ch. 35 ILCS § 5/201	
Indiana	No	n/a	
Iowa	Yes	[Westlaw keeps timing out]	Tax phased out in 1996.
Kansas	Yes	Kan. Stat. § 79-201w	
Kentucky	No	Ky. Stat. § 132.200(40)	M&E exempt from local taxes.
Louisiana	Yes	La. Rev. Code § 47:4301	Express purpose to retain manufacturers in state.
Maine	No	n/a	
Maryland	No	Md. Stat. § 7-301	
Massachusetts	No	n/a	
Michigan	No	n/a	
Minnesota	Yes	Minn. Stat. § 272.02(9)	
Mississippi	No	Miss. Code. Ann. § 27-31-1	
Missouri	No	Mo. Stat. § 150.310	Manufacturers taxed in same manner as merchants.
Montana	Yes	Mt. Stat. § 15-6-201(1)(a)(i)(ff)(iv)	

State	Exempt from Property Tax?	Relevant Statute, if Applicable	Summary Notes
Nebraska	No	n/a	
Nevada	No	n/a	
New Hampshire	No	N.H. Stat. § 72:23	
New Jersey	No	n/a	
New Mexico	No	N.M. § 7-36-33	Special valuation method for certain M&E.
New York	No	n/a	
North Carolina	No	N.C.G.S. § 105-275	
North Dakota	No	n/a	
Ohio	No	Ohio R.C. § 5711.22	Proposal to eliminate tax proposed in 2005.
Oklahoma	Yes	Ok. Stat. Ann. § 2807	M&E subject to ad valorem tax.
Oregon	No	n/a	
Pennsylvania	No	n/a	
Rhode Island	No	R.I. Stat. § 44-3-6	Explicitly does not exempt M&E.
South Carolina	Yes	S.C. Stat. § 12-37-220	
South Dakota	No	n/a	
Tennessee	No	n/a	
Texas	No	Tex. Tax Code § 11.14	
Utah	No	n/a	Exempts M&E from sales tax.
Vermont	No	Vt. Stat. T. 32 § 3802	M&E not subject to statewide education tax.
Virginia	No	Va. Stat. § 58.1-3507	Subject only to local taxation.
Washington	No	n/a	
West Virginia	No	n/a	M&E taxed at constitutionally limited rates.
Wisconsin	Yes	Wis. Stat. 70.11(27)(b)	
Wyoming	No	n/a	

Source: Author Research and Area Development Online: Site and Facility Planning; available at <http://www.areadevelopment.com/Pages/Homepage.html>

Appendix C: Sampling Methodology

To obtain the best estimate of the M&E tax expenditure, we used a stratified random sampling methodology to select firms. Stratified random sampling maximizes the quality of data selected from a population by dividing data into discrete groups or strata and selecting a sample from within each group.²⁹ This sampling methodology was an attractive option because DOR provided upfront information about each manufacturer, such as Standard Industrial Classification code (SIC) and total value of taxable personal property, which helped to divide the firms into groups. These groups contained a selection of firms with different SIC codes as well as different taxable personal property values, ensuring a representative sample of the population of firms. Because we strongly suspected industry and taxable income were the strongest determinants of exempt M&E from the data provided, we used a consolidated two-digit SIC code (yielding thirteen consolidated SIC codes) and quintile of taxable personal property to create our groups. With thirteen consolidated SIC codes and five quintiles, we expected our sample of 475 firms to adequately cover the resulting 65 distinct groups.³⁰ While finer distinctions were considered for grouping our data, such as region of the state, we did not feel the geographic data were more workable than industry data. Additionally, making any finer distinctions would require a much larger sample size and would make for very thin groupings.

In addition to categorizing the sample by SIC and taxable personal property value, we weighted the probability of selecting a particular firm from within a group by the amount of total taxable personal property. Firms with larger taxable personal property had a greater likelihood of being selected. By weighting the probability of selecting firms, the sampling process avoided biasing population estimates by overrepresenting firms with smaller amounts of taxable personal property and presumably smaller amounts of exempt M&E. In sum, the total sample consisted of aggregating samples, which were randomly drawn from each group or stratum, and, in turn, randomly drawn within groups based on the taxable property value of the firm.

Because we used this sampling methodology, a few dominant industries may have a disproportionate contribution toward total M&E when compared to many smaller ones, a pattern expected with the paper industry in Wisconsin's northeast region. Thus, this sampling method controls for any unanticipated regional or industry clustering.

²⁹ The California State Board of Equalization reported that by using a stratified random sampling methodology, its organization surveyed only 5 percent of total firms (550) regarding sales and use taxation, but was able to sample 30-80 percent of total taxable dollars. Depending on the distribution of firms' taxable personal property and anticipating larger economies of scale in capital, we expected California's estimate, a figure based on Sales and Use Tax Distribution, to be low compared to property. California State Board of Equalization. Audit Manual. "Chapter 13: Statistical Sampling." Selection Techniques – 1304.00, Stratified Random Sampling – 1304.15.

³⁰ Thirteen SIC codes multiplied by five quintiles results in 65 distinct groups.

Sample Size

We chose to sample between 400 and 500 manufacturing firms. This decision was based upon the number of observations we expected we could collect and still obtain a reasonably precise estimate. Based upon our sample of taxable M&E, the sample containing the proportional dollar estimate, a sample of 400 firms has a standard error of approximately 9 percent. If taxable M&E is a reliable indicator of M&E and our strata help explain some variation in our sample, we expect our precision to fall at the very least 20 percent above or below the estimate with 95 percent confidence. These results suggest that 400 firms may give us adequate precision. To ensure accurate estimates and a baseline sample size of 400, we settled on a procedure that selected 475.

Technical Notes on Sampling

The sample was extracted from the 10,648 manufacturing firms who filed a 2004 personal property tax from using the SAS procedure “proc surveystest.” The groups or strata were identified as two-digit, consolidated SIC grouping (13 groups) and tier (five quintiles of personal property returns based on size of taxable personal property). SIC groups were consolidated based upon the heterogeneous dollar totals in each two-digit SIC grouping. The following table lists the consolidated SIC groups.

Table 10			
Consolidated Standard Industrial Classification Groups			
Industry	Two-Digit SIC	Number of Firms	Percent of Taxable Personal Property
Apparel and other finished products made from fabrics and similar materials, textiles/leather, and rubber/plastics	22, 23, 30, 31	784	5.3%
Chemicals and allied products	28	467	7.5%
Electronic and other electrical equipment and components except computer equipment	36	353	8.0%
Fabricated metal products except machinery and transportation equipment	34	1,348	5.5%
Food and kindred products	20, 21	887	17.1%
Industrial and commercial machinery; transportation and computer equipment	35, 37	2,018	16.8%
Lumber and wood products	24, 25	1,166	4.2%
Measuring, analyzing, and controlling Instruments; photographic, medical, and optical goods; watches and clocks	38	134	1.8%
Mining, petroleum, and primary metal industry	14, 29, 33	643	5.8%
Miscellaneous manufacturing industries	39	788	3.1%
Paper and allied products	26	373	17.6%
Printing, publishing, and allied industries	27	1,196	5.2%
Stone, clay, glass, and concrete products	32	491	2.3%
Total		10,648	100.0%*

**Numbers add to 100.2% due to rounding.*

Additionally, within groups, we selected firms with “Probability Proportional to Size” (PPS). In SAS, the selected procedure was PPS_SAMPFORD, selecting the stratum with probability proportional to aggregate group size and within stratum proportional to firm size. To mitigate any error in total personal property’s ability to forecast machinery and equipment, the maximum number of firms sampled in each category was set to ten while the ratio of values of total personal property was constricted. A minimum sample selection value of personal property was set at \$100 and a maximum set at \$1 million. These parameters served to suppress any mathematical errors caused by the disparity in scale of firms’ personal property.

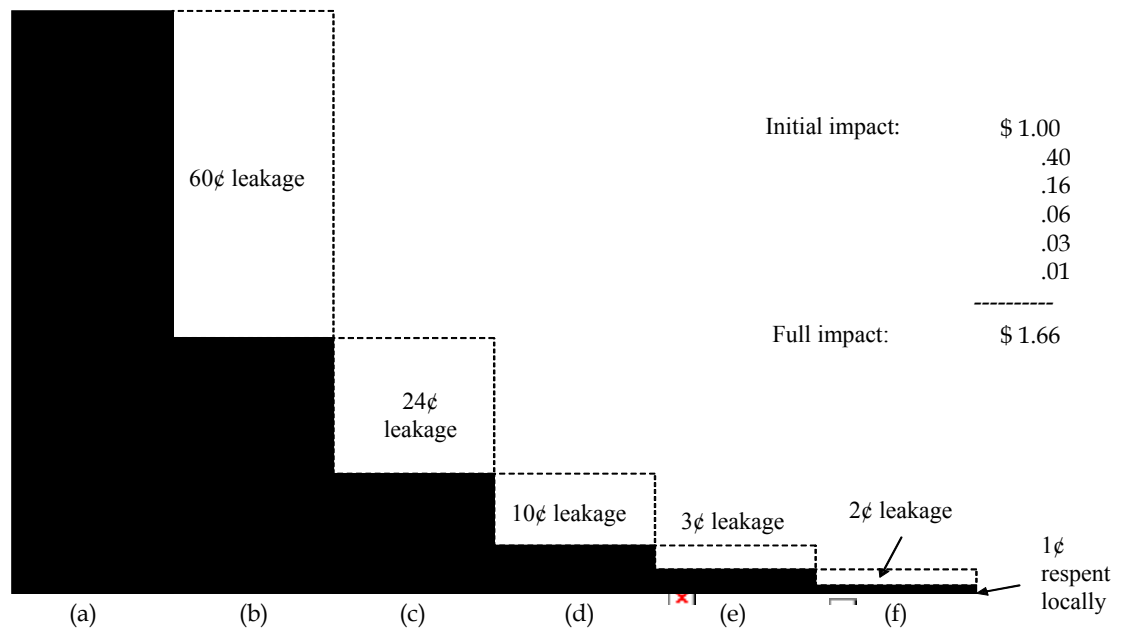
Appendix D: Export Base Theory and Input/Output (I/O) Modeling

While, in theory, economic development encompasses a variety of improvements in overall social welfare, traditional economic analysis generally narrows economic impact study to several key areas: employment, output, and income. While “soft” indicators such as crime rate, income distribution, and diversity of industry can be very important, for practical purposes, employment and income take precedence in discussing the economy. Impact study in particular seeks to take a single event in the economy and forecast its likely spillover to jobs and income. As such, the guiding literature in impact analysis starts with economic base theory, or export base theory.

Export base theory divides the economy into two types of sectors, basic and nonbasic. Basic sectors provide primary goods that exceed local demand. Manufacturers generally serve as an excellent example of basic sectors, producing far more of a good than can be consumed locally. By contrast, nonbasic sectors and goods are intended primarily for local consumption. They produce just enough, or many times less than local demand dictates. Nonbasic sectors include grocery stores, movie theaters, barber shops, and related goods or services.

Because basic sectors draw money into a community, region, or state, they have been highly sought after as engines of economic growth. The engine operates through an increase in income, paid in wages and circulated in the economy multiple times. Beyond having attracted extra money into the local economy, a locale with a basic industry benefits additionally by having that dollar increase demand in nonbasic sectors, perhaps changing hands multiple times within the locality before being leaked. The cascading effect of extra money in a locale, as depicted in Figure 2, is represented by multipliers. Multipliers communicate how that initial dollar has influence over the extended regional economy.

Figure 2 - Impact of \$1 in Exports on the Regional Economy



Leakage refers to the money spent outside the local economy.

*Source: Shaffer, Ron et al. Community Economics: Linking Theory and Practice. Iowa State Press. p. 292.

Measuring whether economic development policies have succeeded can be challenging for states. The most common outcome that these policies seek is job growth (or at least slowing or stopping employment loss). Other metrics, including firm creation, output, investment (both in- and out-state), offshoot business growth, personal income, capital expenditures, labor intensity of manufacturing, high-tech employment, size of new plants, number of relocating firms, and amount of industrial land, can and should be measured (Courant, 1994). Even more difficult to measure is the causal connection between policies and these metrics. Other complexities are introduced when adding time and spatial equations to the evaluation. Short term and long-term effects may be very different. Intrastate policies may also affect key indicators (Papke, 1996).

Export base theory often leads to a predictable conclusion for manufacturers. Attracting basic sectors into a locale such as Wisconsin has greater value than the added jobs, income, and output the individual manufacturer generates. Under these assumptions, manufacturers are extremely valuable community, regional, and state assets, conferring external benefits to the area in which they operate.

Input/output (I/O) analysis attempts to determine the impact an event may have on the economy. On the premise that manufacturers have an external benefit on regional economies, I/O analysis helps model the inter-industry effects of events such as a

relocation or firm expansion. I/O analysis simulates the interdependent regional economy as a network of industries.

Table 11 indicates influential industries from a study conducted in the state of Washington in 1997. In this table, one added job (first column) in a sector leads to a total increase in jobs equaling the multiplier, or full impact of the initial employment addition. The resulting multiplier serves as an indicator of industry influence.

Table 11		
Selected Employment Multipliers for Washington (1997) and Wisconsin (2001)		
Selected Standard Industrial Classification Group	Employment Multiplier	
	Washington 1997	Wisconsin 2001
Field crops, fruits, and vegetables	1.553	1.583
Livestock and products	2.703	2.109
Mining	2.072	2.205
Food products	4.302	5.207
Pulp and paper products	4.679	3.596
Industrial machinery and equipment	2.440	3.156
Real estate	1.937	1.583

Source: Washington State Input/Output Study (1997). Table 4-2a. Washington State Input-Output Multipliers 1997; and Minnesota IMPLAN Group Inc (data and software), 2001.

Appendix E: Sample Proportions Based on Standard Industrial Classification Grouping

Table 12 Sample Distribution of Firms and Personal Property Based on Standard Industrial Classification \$2,187.2 million in Total Personal Property				
SIC Group	Number of Firms	Percent Included in Sample	Total Personal Property (in millions of dollars)	Percent Included in Sample
Apparel, Fabrics, Textiles/Leather, and Rubber/Plastics	784	4.1%	\$115.2	32.6%
Chemicals and Allied Products	467	9.2%	\$163.9	59.1%
Electronic, Other Electrical Equipment, and Components, Except Computer Equipment	353	12.2%	\$174.2	69.4%
Fabricated Metal Products, Except Machinery and Transportation Equipment	1,348	2.4%	\$119.9	22.3%
Food and Kindred Products	887	5.0%	\$374.3	30.8%
Industrial and Commercial Machinery, Transportation and Computer Equipment	2,018	2.2%	\$366.7	47.1%
Lumber and Wood Products	1,166	2.7%	\$91.1	29.4%
Measuring, Analyzing, and Controlling Instruments; Photographic, Medical, and Optical Goods; Watches and Clocks	134	18.7%	\$39.6	87.3%
Mining+Petroleum+Primary Metal	643	5.9%	\$126.6	48.0%
Miscellaneous Manufacturing Industries	788	3.7%	\$67.8	38.8%
Paper and Allied Products	373	13.1%	\$385.4	58.3%
Printing, Publishing, and Allied Industries	1,196	3.0%	\$112.7	42.4%
Stone, Clay, Glass, and Concrete Products	491	5.5%	\$49.8	37.7%
Grand Total	10,648	4.5%	\$2,187.2	42.6%