Report of the
Joint Legislative Audit and Review Commission
To the Governor and
The General Assembly of Virginia

Impact of Regulations on Virginia's Manufacturing Sector

SENATE DOCUMENT NO. 18
2006

In Brief

Impact of Regulations on Virginia's Manufacturing Sector

Senate Joint Resolution 360 directed JLARC staff to study the comparative burden of Virginia environmental, economic, workplace, and tax regulations on manufacturers.

The study used two approaches to estimate the cost to Virginia manufacturers to comply with federal and State regulations. Approach #1 included direct costs and resulted in estimates of around $1 billion. Approach #2 included direct costs as well as other types of costs and resulted in estimates as high as $3.49 billion.

The study concludes that federal regulations are the primary driver of regulatory costs in Virginia and that Virginia regulations do not add substantial costs. Furthermore, Virginia regulations were not the primary cause of the recent job loss in the manufacturing sector that also occurred in other states, nationwide, and in other industrialized nations.

Virginia manufacturers identified several regulatory issues for further analysis and consideration, including the efficiency of environmental permit processing and the machinery and tools tax. More broadly, efforts to foster a strong manufacturing sector in the State should consider other factors that are important to manufacturers, such as workforce issues.

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This report is available on the JLARC website at http://jlarc.state.va.us

COMMONWEALTH of VIRGINIA

Joint Legislative Audit and Review Commission

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November 1, 2006

The Honorable Thomas K. Norment, Jr.
Chairman
Joint Legislative Audit and Review Commission
General Assembly Building
Richmond, Virginia 23219

Dear Senator Norment:

Senate Joint Resolution 360 enacted by the 2005 General Assembly directed JLARC to report on the comparative burden of regulatory compliance on Virginia's manufacturing sector. Staff were directed to calculate the total cost to Virginia manufacturers of complying with environmental, economic, workplace, and tax regulations and to compare these compliance costs to those of manufacturers in other states and to those of companies in other sectors.

On behalf of the Commission staff, I would like to thank the staff at the Virginia Manufacturers Association, the Virginia manufacturing companies that provided cost information, and the Departments of Agriculture and Consumer Services, Planning and Budget, Environmental Quality, Labor and Industry, and Taxation for their assistance during this study.

Sincerely,

Philip A. Leone
Director

Table of Contents

JLARC Report Summary:

Impact of Regulations on Virginia's Manufacturing Sector

Key Findings

- Virginia's manufacturing sector lost approximately 66,000 jobs between 2000 and 2005. However, the sector is still a major component of the State's economy. Globalization, technology and productivity improvements, and increasing labor costs were the primary drivers of the job loss in Virginia. Virginia's regulations were not the primary reason for the sector's decline in jobs. (Chapter 1)
- Virginia manufacturing companies spent between $923 million and $3.49 billion to comply with federal and Virginia regulations in 2005. Federal regulations are the major driver of these compliance costs. (Chapters 2-5)
- Overall, Virginia's regulations generally follow federal regulations and are not substantially different from other states selected for comparison. (Chapters 2-5)
- Fostering manufacturing in Virginia requires considering factors other than regulations. These factors include workforce issues, such as workforce quality and the availability of Virginians with the necessary technical skills, and other issues such as transportation infrastructure. (Chapter 6)

Senate Joint Resolution 360, enacted by the 2005 General Assembly, directed JLARC staff to study the comparative burden of regulatory compliance on Virginia's manufacturing sector. The resolution notes the importance of manufacturing to Virginia's economy and cites the recent loss of jobs in Virginia's manufacturing sector. The resolution is provided in Appendix A.

VIRGINIA'S MANUFACTURING SECTOR EXPERIENCED SUBSTANTIAL JOB LOSS

Manufacturing is a major component of Virginia's economy. The sector is Virginia's third largest in terms of private employment, with approximately 296,000 people working in the manufacturing sector in 2005. However, manufacturing's prominence has diminished over the last five years. Between 2000 and 2005, the sector lost 66,000 jobs—nearly one-fifth of all manufacturing jobs in the State. Much of this job loss has come in labor-intensive manufacturing sub-sectors, most notably apparel, textile mill, and furniture and related product companies. Declines in these sub-sectors hit localities in the southern and western regions of the State especially hard.

Three major economic trends have heavily impacted the manufacturing sector in recent years. First, the globalization of the domestic economy has allowed emerging economies to increase their exports to the United States. In 1990 (before the North American Free Trade Agreement was passed in 1992), Mexico accounted for six percent of U.S. imports. By 2006, however, Mexico's portion of imports had nearly doubled to more than ten percent. The growth in imports from China during the time period is even more dramatic, more than quadrupling from 3.1 percent in 1990 to 14 percent in 2006. However, globalization has also provided the domestic manufacturing sector with more foreign buyers of their products. According to the U.S. Department of Commerce, manufactured goods comprise 86 percent of Virginia's total exports. Transportation equipment and chemical manufacturers are the largest exporters, each accounting for 16 percent of Virginia's total exports.

Second, modern technological and process improvements have allowed manufacturers to be far more productive. Between 1995 and 2005, U.S. manufacturing output per person increased more than 50 percent. This productivity gain has occurred during a time when net demand has been relatively stable as a percentage of Gross Domestic Product. Consequently, without a commensurate increase in demand to match productivity gains, manufacturing firms are choosing to maintain supply by relying on new technology rather than people.

Finally, labor costs for the manufacturing sector have increased an inflation-adjusted 26.3 percent between 1986 and 2004. The increased domestic reliance on manufacturing imports mentioned above has increased competition, making it more difficult for manufacturers to recoup these labor cost increases by raising prices. Moreover, the manufacturing wages paid per hour in countries that are driving the growth in imports, particularly China and Mexico, are substantially lower than the average of $22.87 paid in the United States or the averages paid in other developed countries. This compounds the effect of the increase in U.S. labor costs on domestic manufacturing companies trying to compete in the global market.

REGULATIONS BENEFIT THE PUBLIC AND, IN SOME INSTANCES, MANUFACTURERS

JLARC staff reviewed environmental, economic, workplace, and tax regulations. The long-term and public nature of the regulatory process generally ensures that these regulations have a purpose. These purposes can be wide ranging. Through this process, government has created regulations that apply to manufacturers pri-

marily because of the sector's impact on the environment or the hazardous nature of working in the manufacturing sector. For example, in 2001, five of the top ten point sources of pollution in Virginia were manufacturing companies (the other five were electric utility companies). Additionally, more than one in five injury and illness cases in private industry occur in the manufacturing sector.

Manufacturers' compliance with federal and Virginia regulations results in benefits. While manufacturers usually incur the majority of the cost of complying with regulations that apply to the sector, other groups typically receive the majority of the benefits:

- Environmental regulations primarily benefit the natural environment and local communities by protecting air, water, land, and citizens from harmful emissions.
- Economic regulations typically benefit consumers by setting safety standards for food, drugs, and other manufacturered products.
- Workplace regulations primarily benefit employees of manufacturers and, in some instances, manufacturers themselves, by setting standards for the economic and physical safety of workers.

APPROACH #1 COST ESTIMATE IS AROUND $1 BILLION WHILE APPROACH #2 IS AS HIGH AS $3.49 BILLION

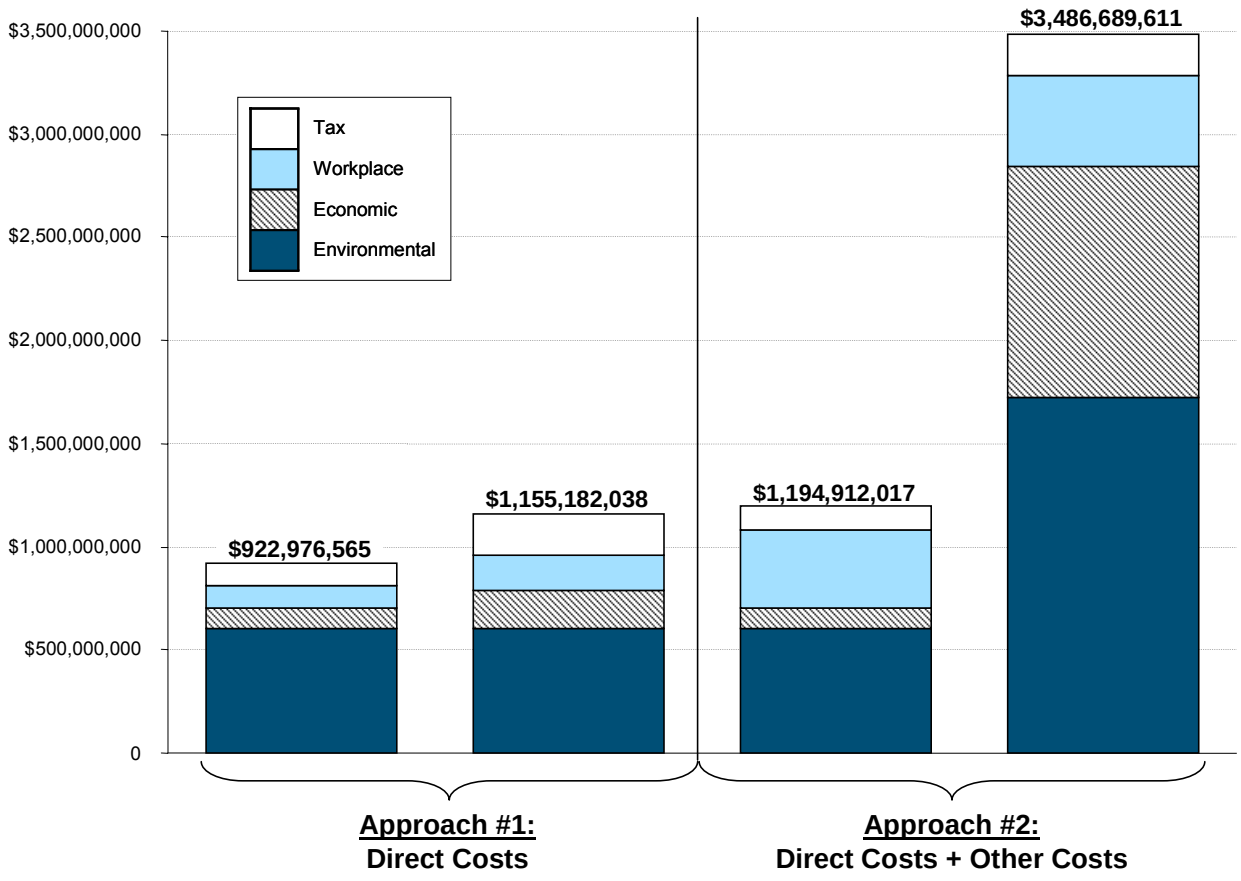
Previous Attempts at Similar Studies

The U.S. Government Accountability Office and another state's legislative oversight organization have previously attempted similar studies. These studies met with significant challenges, which JLARC staff have used as lessons learned to inform the methodology for this study. An overview of these previous attempts and additional methodological information are provided in Appendix B.

The regulatory impact estimates provided in this report were developed using the most appropriate information available, including existing estimates from federal agencies, academic and other organizations, and Virginia manufacturing companies. However, it should be noted that there is an inherent level of uncertainty to estimating the impact of regulation, particularly when compared to other types of estimates or projections.

JLARC staff used two main approaches to derive estimates for the cost to Virginia manufacturers to comply with environmental, economic, workplace, and tax regulations. Approach #1 included only direct cost expenditures while approach #2 included direct costs plus other types of costs. The resulting total compliance cost estimate using approach #1 is between $923 million and $1.16 billion (see figure on p. iv). Environmental regulations are the primary driver of these compliance costs, representing between one-half and two-thirds of total direct costs. The resulting total compliance cost estimate using approach #2 is from $1.19 billion to $3.49 billion. Environmental and economic regulations drive the increase, and together account for nearly 60 percent to more than 80 percent of total direct and other costs.

Total Cost for Manufacturers to Comply With Federal and State Regulation Is From $923 Million to $3.49 Billion



Source: JLARC staff-adjusted existing estimates of regulatory compliance costs from federal agencies and academic and other sources.

Costs to Virginia Manufacturers of Complying With Regulation Per Establishment, Employee, and as Percentage of Other Relevant Measures

	Amount (2005)	Approach #1 Estimate	Approach #2 Estimate
Establishments	6,119	$150,838 – $188,786[1]	$195,237 – $569,814
Employees	295,697	$3,121 – $3,907[2]	$4,041 – $11,791
Payroll	$11,915,146,000	7.7% – 9.7%	10.0% – 29.3%
Value Added	$49,714,651,000	1.9% – 2.3%	2.4% – 7.0%
Total Gross State Product	$352,745,000,000	0.3%	0.3% – 1.0%

[1] Cost is provided as per Virginia manufacturing establishment.
[2] Cost is provided as per Virginia manufacturing employee.

Source: JLARC staff analysis.

Inclusion of other costs, such as the opportunity cost of lost production efficiency, is the major reason why approach #2 results in a substantially higher estimate. Including these less directly measurable types of costs produces cost estimates with a higher degree of uncertainty than cost estimates based only on direct costs that are actual expenditures.

The table on page iv places these large numbers in some context. Estimated compliance costs, on average, ranged from just over $150,000 to nearly $570,000 for each of Virginia's manufacturing establishments. The compliance costs, once standardized by the number of manufacturing employees in Virginia, equates to an average cost of between $3,121 and more than $11,700 per employee. The compliance costs represent between approximately 1.9 percent and seven percent of the total value-added for the sector and between about one-third of a percent and one percent of the total gross state product.

JLARC staff case studies with Virginia manufacturers and results from the JLARC staff survey of Virginia manufacturers yield several themes. First, in all regulatory areas, companies had difficulty disentangling (1) costs attributable to regulation versus costs they would otherwise incur and (2) costs resulting from federal regulation versus costs resulting from State regulation. Second, though companies had some difficulty determining costs, the estimates they provided are likely more precise and have a higher degree of certainty for their company than aggregate estimates for all companies. Finally, compliance costs for specific manufacturing companies can vary widely depending on their sub-sector, size, organizational efficiency and culture, and the year costs are measured.

Companies and JLARC staff also identified several regulatory issues for further analysis and consideration, including

- the extent to which Virginia's Department of Environmental Quality can process permits faster, and whether it can undertake additional activities to further encourage manufacturers to reduce pollution;
- whether the overlap between the Virginia Workers' Compensation Act and federal Longshore and Harbor Workers Compensation Act causes sufficient increases in compliance costs that the overlap should be addressed; and
- the impact of the machinery and tools tax on manufacturers in the relatively few localities that rely heavily on the tax for local revenue.

VIRGINIA REGULATIONS LARGELY MIRROR FEDERAL REQUIREMENTS AND DO NOT ADD SUBSTANTIAL COSTS

Virginia's regulations that impact manufacturers generally do not go substantially beyond minimum federal requirements or include regulations without a clear purpose or intent. This conclusion results from several findings. First, while Virginia's regulations in some cases differ from other states, primarily for certain environmental regulations and taxes (especially the machinery and tools tax), its regulations are overall similar to those of the other mid-Atlantic and southern states examined during this review.

Sufficient data is not—and will likely never be—available to conduct a full cost-benefit analysis of all federal and Virginia regulations. However, there is some evidence that suggests that, overall, the benefits to society of Virginia's regulations are at least equal to and likely outweigh its costs to manufacturers. In most circumstances, Virginia either closely mirrors federal regulations or deviates from them based on Virginia's unique needs. These deviations or additions generally have a clear purpose, and while they impose costs on manufacturers, they also yield benefits for Virginia's natural environment, employees, and consumers. Therefore, it is reasonable to assume that the tendency for federal agency analysis to conclude that the benefits of federal regulation are usually greater than the costs could also be applied to Virginia.

Second, Virginia's regulatory process is a long-term, public approach to considering new regulations or changes to existing regulations. This process, along with legislative review of proposed regulations, appears to eliminate regulatory provisions that are unreasonable or not feasible in terms of compliance. The willingness of executive branch agencies to engage and partner with manufacturers during the regulatory development process also appears to limit the scope of regulations and appears to generally prevent regulations with overall costs that exceed overall benefits.

Finally, the majority of Virginia manufacturers that responded to the JLARC staff survey believed Virginia makes few modifications to federal regulations and the modifications reflect Virginia's priorities. Only 14 percent of companies responding believe that Virginia regulations go substantially beyond federal requirements.

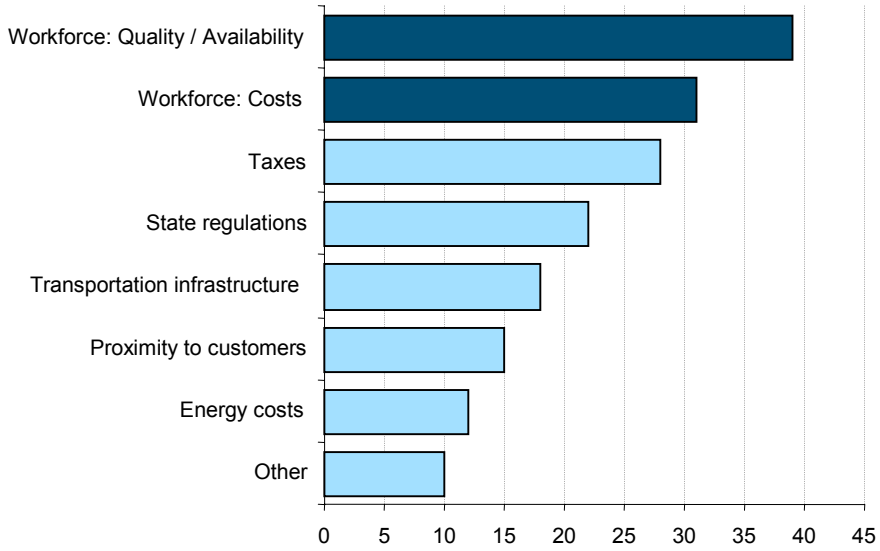
VIRGINIA REGULATIONS WERE NOT THE PRIMARY REASON FOR MANUFACTURING'S DECLINE

Virginia lost 66,000 manufacturing jobs between 2000 and 2005; the sector now employs about 296,000 people. This five-year loss represented nearly 20 percent of the State's total manufacturing employment. While this job loss is indisputable, the root cause is

attributable to many factors, including globalization, technological improvements, and changes in input costs and pricing power. Furthermore, manufacturing job loss has been a recent trend in other states, nationwide, and in other industrialized nations, suggesting that the cause of the job loss was not unique to Virginia.

The JLARC staff survey of Virginia manufacturers found that workforce considerations were the major drivers of manufacturers' business decisions, followed by taxes and regulations (see figure). The ranking of these factors, when considered along with the relative stability of Virginia's regulations prior to and during the time of the most significant job loss, suggests that Virginia regulations were not the primary driver of the job loss. More broadly, Virginia typically ranks highly when compared to other states on a range of factors intended to quantify the extent to which a state is attractive to business. For example, Virginia was ranked the best overall state for business in 2006 and has three localities among the top 15 in the nation when ranked by cost of doing business, job growth, and educational attainment, according to *Forbes.com*.

Workforce Issues Have the Biggest Impact on Whether to Stay in Virginia, Open a New Facility, or Close an Existing Facility



Note: Sixty-one companies answered the question, but were asked to select multiple factors. This resulted in 175 total factors being identified by companies.

Source: JLARC staff survey of Virginia manufacturers, 2006.

FOSTERING MANUFACTURING IN VIRGINIA REQUIRES CONSIDERING FACTORS OTHER THAN REGULATIONS

Sweeping changes to Virginia's regulations would not be feasible or prudent.

Nationally, manufacturing is recovering as the domestic economy has improved. In Virginia, the loss of manufacturing jobs has moderated and Virginia's economy overall is strong, with unemployment slightly above three percent. Overall, Virginia's regulations closely follow federal regulations and deviations appear to be based on Virginia's needs. The State's national reputation as a business-friendly state and the results of this review suggest that Virginia's regulations are generally sound. Simply stated, sweeping changes to Virginia's regulations would not be feasible or prudent.

To maintain and develop a strong manufacturing sector it appears that there are some issues that may be more critical for manufacturers than the costs to comply with Virginia regulations. Any efforts to support manufacturing would need to consider the wide range of these factors that are impacting the sector. Some possible questions to facilitate this consideration are listed below.

Considerations for Fostering Virginia's Manufacturing Sector

- What role will manufacturing play in Virginia's future economy? How will the manufacturing sector's role in the State economy change or evolve over time?
- How can Virginia complement and benefit from the federal American Competitiveness Initiative, particularly on nationwide and international issues primarily beyond Virginia's control?
- What are the manufacturing sub-sectors Virginia wishes to recruit? What are the manufacturing sub-sectors Virginia wishes to maintain and support?
- In what factors that influence private sector decision-making does Virginia have an advantage? Which manufacturing sub-sectors in particular would be interested in these factors? In what factors does Virginia need to improve, and who needs to participate in the improvement initiatives?
- How can the perspectives of citizens, interest groups, manufacturers, and other stakeholders be weighed and considered? What trade-offs will be necessary?

Source: JLARC staff analysis of interviews with Virginia executive branch agencies, Virginia Manufacturers Association, Virginia Economic Development Partnership, Virginia Chamber of Commerce, manufacturing companies located in Virginia, and environmental advocacy groups.

The Manufacturing Development Commission and other initiatives present opportunities to further address these considerations. Any efforts to foster stronger manufacturing in Virginia should account for the trade-offs that may be necessary and fully consider the range of impacts not only to manufacturing companies but to the natural environment, local communities, employees, and consumers.

Chapter 1

The Manufacturing Sector and Regulatory Impact Analysis

In Summary

In the last decade, manufacturers nationwide have been confronted with a challenging business environment. Globalization of the domestic economy, technological and productivity improvements, and increasing labor costs have led to significant job loss. Fewer than 300,000 Virginians are now employed by manufacturing companies—nearly 20 percent less than a decade ago. Localities in the western and southern regions of the State that have historically relied heavily on manufacturing for employment have been hit particularly hard. Against this backdrop, Senate Joint Resolution 360 directed JLARC staff to study the comparative burden of regulations on manufacturers. Regulations have been adopted at the federal and State levels to meet various public purposes, but also have cost impacts on manufacturers. To analyze these costs, important methodological limitations have to be recognized, including the difficulty of determining a baseline for comparison. With appropriate caveats noted, however, useful information about the magnitude of regulatory impact on manufacturers can be developed.

Senate Joint Resolution 360, enacted by the 2005 General Assembly, directs JLARC staff to study the comparative burden of regulatory compliance on Virginia's manufacturing sector. The resolution notes the importance of manufacturing to Virginia's economy and cites the recent loss of jobs in Virginia's manufacturing sector. The resolution is provided in Appendix A.

The mandate directed staff to calculate the total cost to Virginia manufacturers of complying with environmental, economic, workplace, and tax regulations. JLARC staff identified and adjusted existing estimates of regulatory cost, conducted case studies of selected companies, and administered a survey of Virginia manufacturers. The mandate also directed staff to compare these compliance costs to those of manufacturers in other states and to those of companies in other sectors. However, no other states have calculated compliance costs that can be used for comparison. Consequently, agency staff in selected states were contacted to characterize and compare their regulations that apply to manufacturers to Virginia's. In addition, no calculations of compliance costs existed for companies in other sectors in Virginia. Furthermore, manufacturers themselves noted that such a comparison can be misleading for environmental, economic, and workplace regulations because of differences among business sectors. As a result, JLARC staff only compared regulatory compliance with tax regulations for manufacturing to other business sectors.

MANUFACTURING IS AN IMPORTANT COMPONENT OF THE NATIONAL AND STATE ECONOMY

Manufacturing is an important component of an industrial economy. For this review, JLARC staff define manufacturing consistent with the sector's definition in the North American Industrial Classification System (NAICS). Nationally and in Virginia, the manufacturing sector has experienced dramatic job loss during the last decade. The sector is, however, still a critical component of both the nation's and Virginia's economy.

Manufacturing Definition and Role

For this study, JLARC staff needed to clearly delineate which companies are manufacturers. Staff chose a standard definition used by the U.S. Census Bureau (Census) and U.S. Bureau of Labor Statistics (BLS) as its working definition of manufacturing. This definition is from the NAICS, which is an internationally accepted taxonomy of sectors, sub-sectors, and industries that comprise an economy.

Based on the NAICS definition, JLARC staff defined the manufacturing sector as "establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products." These establishments are often described as plants, factories, or mills, and characteristically use power-driven machines and materials-handling equipment. The manufacturing sector comprises 21 sub-sectors, from beverage and tobacco to leather products (Table 1).

Companies that represent these manufacturing sub-sectors include some of the largest and most recognizable domestic firms. For example, in the chemical sub-sector are major pharmaceutical companies such as Pfizer and Merck, the food sub-sector includes

Table 1: Manufacturing Sub-Sectors

Beverage and tobacco products	Transportation equipment
Food	Chemical
Plastics and rubber products	Computer and electronic products
Paper	Fabricated metal products
Textile mills	Wood products
Machinery	Printing and related support activities
Electrical equipment, appliance, and components	Furniture and related products
Nonmetallic mineral products	Primary metal
Apparel	Petroleum and coal products
Textile product mills	Leather and allied products
Miscellaneous	

Source: North American Industrial Classification System, 2002.

Kraft and General Mills, the beverage and tobacco sub-sector includes PepsiCo and Philip Morris, and the transportation equipment sub-sector includes auto-makers such as Ford. Within each sub-sector are many smaller companies that also play an important role in the health of the manufacturing sector.

A strong manufacturing sector has at least two unique benefits when compared to other sectors of the economy. First, domestic research and development and innovation largely stem from the manufacturing sector. According to the U.S. Department of Commerce, the U.S. manufacturing sector accounts for more than 90 percent of patents registered annually. Second, demand in the manufacturing sector stimulates demand in other sectors. According to the Bureau of Economic Analysis, every $1 of demand for a manufactured good generates $0.55 of manufacturing Gross Domestic Product (GDP) and $0.45 of non-manufacturing GDP.

The U.S. Manufacturing Sector

The importance of the manufacturing sector in today's domestic economy is inarguable, but varies depending on how that importance is measured. For example, of the 18 business sectors tracked by Census, manufacturing ranked

- first with $576 billion in annual payroll, or 15.5 percent of the nation's private sector payroll;
- second with $3.9 trillion in sales receipts, or 18.3 percent of the nation's total sales;
- second with 15 million employees, or 13.5 percent of the nation's total employment; and
- ninth with 350,828 establishments, or 5.1 percent of the nation's total business establishments.

More broadly, manufacturing, along with the health care and social assistance, retail trade, and accommodation and food services sectors, accounts for half of the nation's employment. These sectors are among the eight that comprise nearly 80 percent of total employment, while the remaining 10 sectors account for the rest.

In recent years, however, the national economy as a whole has generally outpaced the manufacturing sector. Table 2 shows the changes in several key measures of conditions in the U.S. manufacturing sector and all sectors between 1992 and 2002. Although sales and payroll grew for the manufacturing sector during the time period, all sectors of the economy in total grew faster than manufacturing in number of establishments, sales, payroll, and

Table 2: Nation's Manufacturing Sector Has Lagged Behind Other Sectors

	Manufacturing			All Sectors (Including Manufacturing)
	1992	2002	% Change 1992–2002	% Change 1992–2002
Establishments	381,696	350,828	-8.1%	22.5%
Sales ($1,000)	$3,004,722,800	$3,916,136,712	30.3	62.1
Payroll ($1,000)	$559,087,300	$576,170,541	3.1	75.3
Employees	18,204,900	14,699,536	-19.3	25.0

Source: Economic Census, 1992, 1997, and 2002, U.S. Census Bureau.

employees. There was a considerable decline in the number of establishments and employees in the manufacturing sector. Nationally, the manufacturing sector employed about one-fifth fewer people in 2002 than it did a decade earlier—a loss of about 3.5 million jobs.

This decline in the percentage of the U.S. working population employed by the manufacturing sector is a long-term trend, stemming from the nation's evolution from an industrial-based to an information and service-based economy. Manufacturing comprised 19 percent of total U.S. employment in 1965 and now comprises about 13 percent. During this long period of decline in manufacturing employment, professional and business services and education and health care have both roughly doubled in their proportion of U.S. workers, employing 15 and 16 percent of workers, respectively, in 2005.

Virginia's Manufacturing Sector

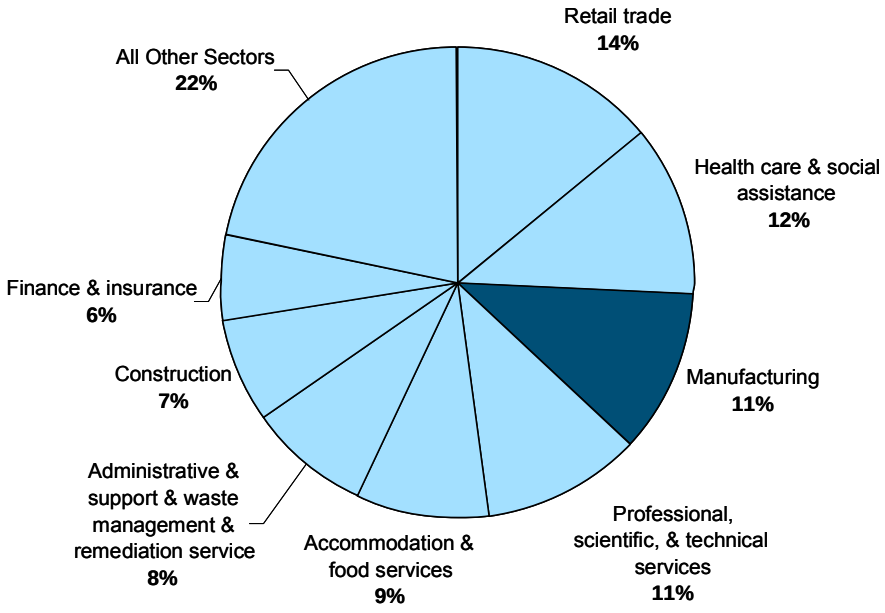
As with the national perspective, the importance of manufacturing to Virginia's economy varies depending on the measures used to gauge the sector's importance. In 2002, of the 18 sectors tracked by Census for Virginia, manufacturing ranked

- first with $83.9 billion in sales receipts (no percent of total is available due to missing sales data for three sectors);
- second with $11.6 billion in annual payroll, or 12 percent of Virginia's private sector payroll;
- third with 328,476 employees, or 11 percent of Virginia's total employment; and
- eleventh with 5,909 business establishments, or 3.4 percent of Virginia's total.

More broadly, the following sectors together account for more than half of Virginia's total employment: retail trade; health care and social assistance; manufacturing; professional, scientific, and technical services; and accommodation and food services. Eleven sectors comprise 90 percent of total Virginia employment while the remaining seven sectors account for the rest. Figure 1 shows the percentage that the major sectors comprise of Virginia's total employment.

Virginia is home to manufacturing companies in each of the 21 NAICS manufacturing sub-sectors. The largest manufacturing sub-sectors represented by number of establishments include fabricated metal products, printing and related support activities, and furniture and related products (Table 3). Virginia's largest sectors in terms of sales include beverage and tobacco products, transportation equipment, and food. Those that employ the most people include transportation equipment, food, and plastics and rubber products.

Figure 1: Manufacturing Is Still One of the Largest Employers in Virginia



Source: Economic Census, Summary Statistics by 2002 NAICS, 2002, U.S. Census Bureau.

Table 3: Virginia's Manufacturing Sub-Sectors

Establishments			Sales			Employees		
	Number	% of Virginia Manufacturing Total		Amount ($1,000s)	% of Virginia Manufacturing Total		Number	% of Virginia Manufacturing Total
Fabricated metal products	787	13.3%	Beverage and tobacco products	$14,990,005	17.9%	Transportation equipment	36,117	11.6%
Printing and related support activities	767	13.0	Transportation equipment	10,205,760	12.2	Food	33,280	10.7
Miscellaneous	555	9.4	Food	8,968,506	10.7	Plastics and rubber products	25,419	8.2
Furniture and related products	545	9.2	Chemical	7,985,478	9.5	Computer and electronic products	19,038	6.1
Wood products	529	9.0	Plastics and rubber products	5,184,705	6.2	Furniture and related products	18,597	6.0
Food	457	7.7	Computer and electronic products	4,981,698	5.9	Printing and related support activities	18,565	6.0
Nonmetallic mineral products	366	6.2	Paper	4,168,307	5.0	Fabricated metal products	18,437	5.9
Machinery	326	5.5	Fabricated metal products	3,305,057	3.9	Wood products	18,222	5.8
Computer and electronic products	254	4.3	Textile mills	3,178,052	3.8	Chemical	17,527	5.6
Remaining 12 sub-sectors	1,323	22.4	Remaining 12 sub-sectors	20,984,979	25.0	Remaining 12 sub-sectors	106,585	34.4
Establishment Totals	5,909	100%	Sales Totals	$83,952,547	100%	Employee Totals	311,787	100%

Source: 2002 Economic Census, U.S. Census Bureau.

In Virginia, the manufacturing sector employed nearly one-quarter fewer people in 2002 than it did just ten years earlier.

Consistent with the national trend, Virginia's economy as a whole has also outpaced its manufacturing sector. Table 4 shows the changes in several key measures between 1992 and 2002. In Virginia, the manufacturing sector employed nearly one-quarter fewer people in 2002 than it did just ten years earlier—a loss of more than 95,000 jobs. In addition, Virginia lost more than 600 manufacturing establishments during that time period, a decline of about 10 percent. All other sectors increased in establishments, sales, and employees during the time period, while manufacturing only increased sales.

Much of Virginia's manufacturing job loss has come in labor-intensive manufacturing sub-sectors, most notably the apparel, textile mill, and furniture and related product sub-sectors. Employment declines in these sub-sectors affected certain regions of the State more than others. Seventeen localities lost more than 50 percent of their manufacturing jobs between 1997 and 2004 (Figure 2). However, during this time 19 localities actually increased manufacturing jobs.

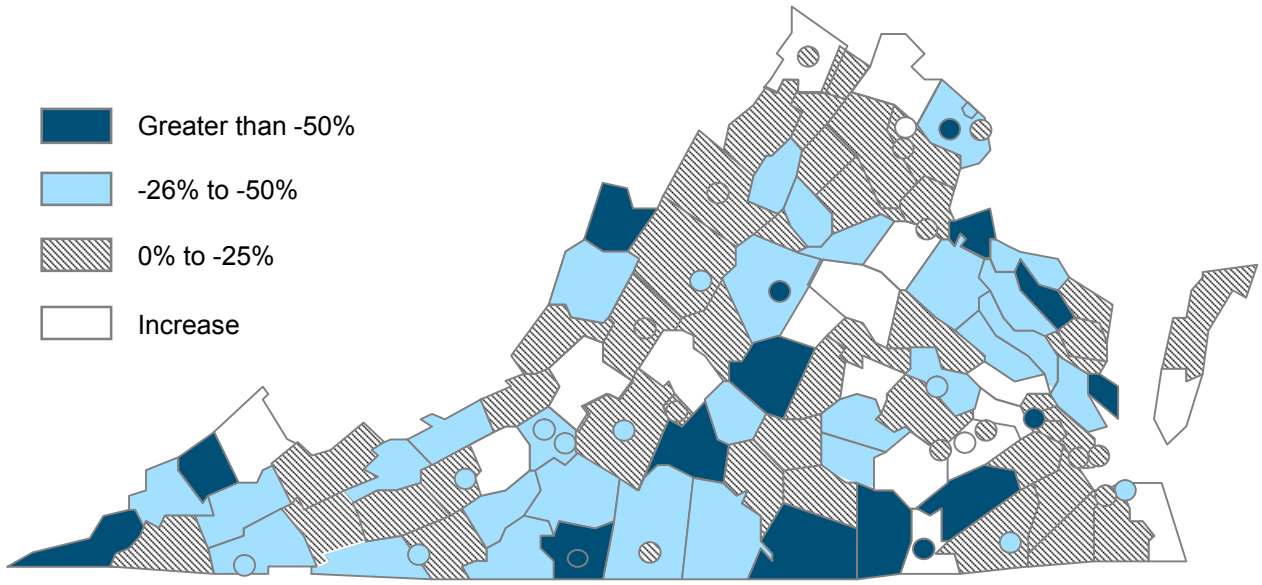
During this decline in manufacturing jobs, Virginia's economy overall remained relatively strong. However, 34 localities had declines in both manufacturing and total employment between 1997 and 2004 (Figure 3). These localities are primarily in the southern and western regions of the State. For example, Henry County lost 53 percent of its manufacturing jobs while at the same time losing 30 percent of its total employment. Most Virginia localities lost manufacturing jobs but increased total employment while 18 localities increased both manufacturing jobs and total employment. Even after the period of job loss, the southern and western regions of the State still rely much more heavily on manufacturing for employment than Virginia's northern, central, and eastern regions (Figure 4). Eleven localities still rely on manufacturing for more than 30 percent of their total employment while manufacturing comprises between 20 and 29 percent of the employment for an additional 27 localities.

Table 4: Virginia's Manufacturing Sector Has Not Kept Pace With Other Sectors

	Manufacturing			All Sectors (Including Manufacturing)
	1992	2002	% Change 1992–2002	% Change 1992–2002
Establishments	6,524	5,909	-9.4%	72.6%
Sales ($1,000)	$66,081,000	83,952,547	27.0	98.8
Payroll ($1,000)	n/a	11,632,963	n/a	n/a
Employees	407,200	311,787	-23.4	91.5

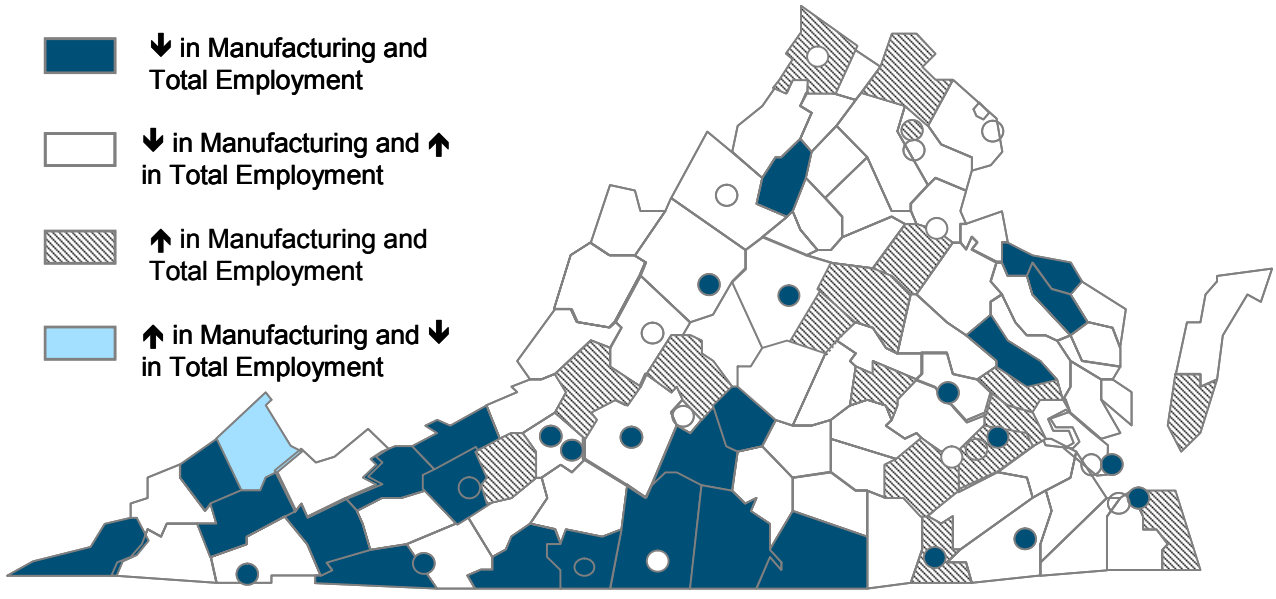
Source: Economic Census, 1992, 1997, and 2002, U.S. Census Bureau.

Figure 2: Most Virginia Localities Lost Manufacturing Jobs Between 1997 and 2004



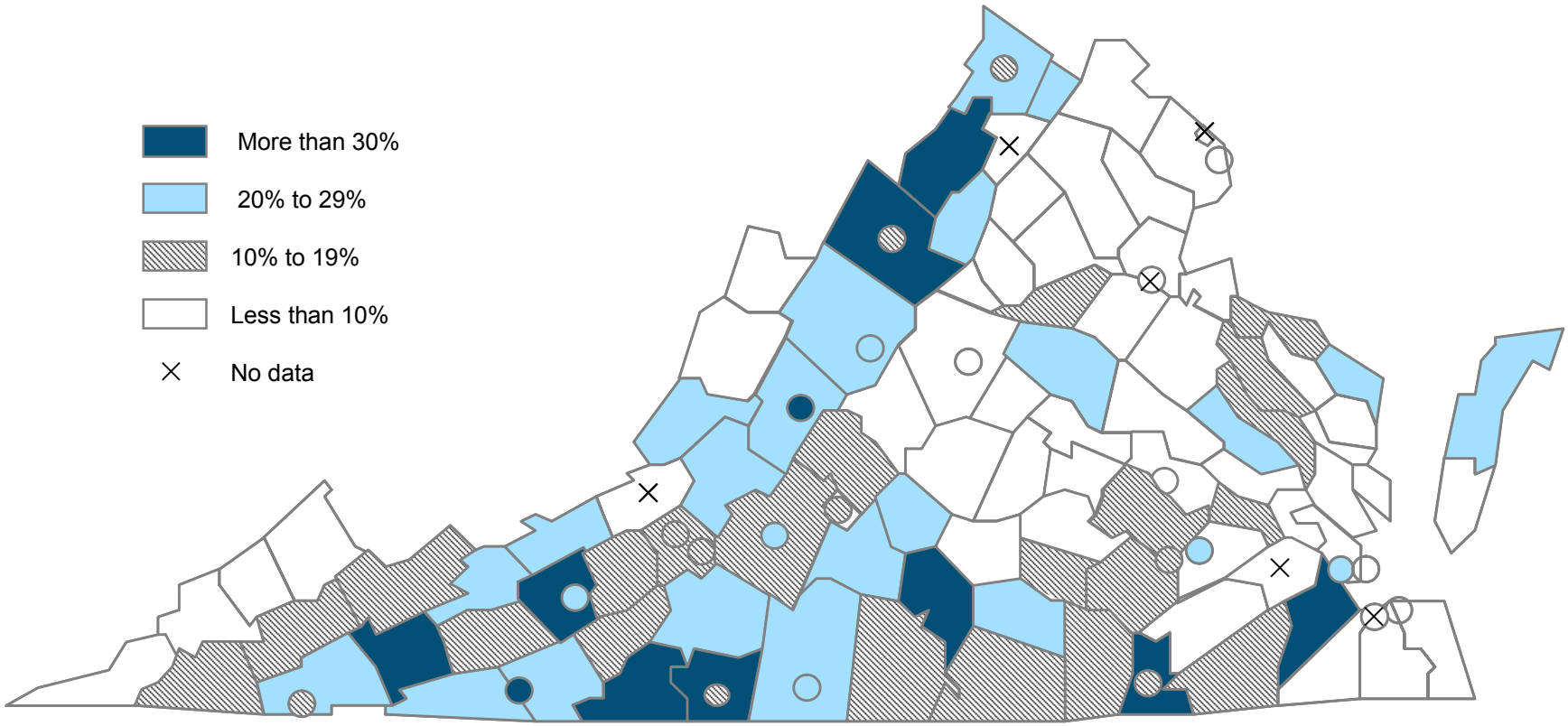
Source: Quarterly Census of Employment and Wages, 1997, 2004, U.S. Bureau of Labor Statistics.

Figure 3: Some Virginia Localities Declined in Both Manufacturing Jobs and Total Employment Between 1997 and 2004



Source: Quarterly Census of Employment and Wages, 1997, 2004, U.S. Bureau of Labor Statistics.

Figure 4: Virginia's Southern and Western Localities Still Rely Heavily on Manufacturing as Percent of Total Employment



Source: Quarterly Census of Employment and Wages, 2004 data, U.S. Bureau of Labor Statistics.

Virginia's manufacturing sector has continued to lose jobs since the 2002 Economic Census, but at a slower pace.

According to BLS, Virginia's manufacturing sector has continued to lose jobs since the 2002 Economic Census but at a slower pace. The sector employed 304,900 people in 2003, 299,200 in 2004, and an estimated 296,000 in 2005. Despite these changes in manufacturing employment, Virginia's overall economy remains among the most robust in the nation, with current unemployment of roughly three percent.

MAJOR TRENDS AFFECTING MANUFACTURING

The national and Virginia manufacturing environment described above has been affected by several macro-economic and sector-specific trends, including globalization, technological advancement, and increases in labor costs. These trends appear to be among the most significant root causes of the changes to the manufacturing sector. None of these root causes relate to government regulation, but they are critical—and perhaps more salient—to placing the evolution of the manufacturing sector in proper perspective.

Globalization Has Changed the U.S. Manufacturing Environment

Globalization of the domestic economy through increased trade and the further industrialization of other nations has had a significant impact on the U.S. manufacturing sector. Manufacturers and advocacy groups target globalization as the major culprit in the decline in domestic manufacturing jobs. However, while globalization has increased competition for domestic companies, it has also opened new markets in other countries for U.S. manufacturers. Globalization has resulted in more trade, in its simplest form measured as the value of imported and exported goods. However, the increase in goods imported into the United States has far outpaced the increase in goods exported by U.S. companies. In 1994, the United States imported $628 billion worth of goods but exported only $482 billion in goods. Ten years later, this deficit had grown dramatically. By 2004, imports had risen 127 percent to $1.4 trillion while exports had risen only 62 percent to $789 billion.

Much of the real growth in imported manufactured goods is from developing nations. For example, in 1990 (before the North American Free Trade Agreement was passed in 1992), Mexico accounted for six percent of U.S. imports. By 2006, however, Mexico's portion of imports had nearly doubled to more than ten percent. The growth in imports from China is even more dramatic, more than quadrupling from 3.1 percent in 1990 to 14 percent in 2006.

However, globalization has also provided the domestic manufacturing sector with more foreign buyers of their products. According to the U.S. Department of Commerce, manufactured goods com-

Manufactured goods comprise 86 percent of Virginia's total exports.

prise 86 percent of Virginia's total exports, with transportation equipment and chemical products being the largest, each accounting for 16 percent of Virginia's total exports. Globalization has also created domestic jobs that would not exist without foreign investment. For example, foreign-owned companies now have a significant presence in Virginia. According to the U.S. Department of Commerce, foreign-controlled companies employed 138,600 workers in Virginia in 2003. More than a quarter of these jobs, 35,700, were in the manufacturing sector, accounting for nearly 12 percent of Virginia's total manufacturing employment.

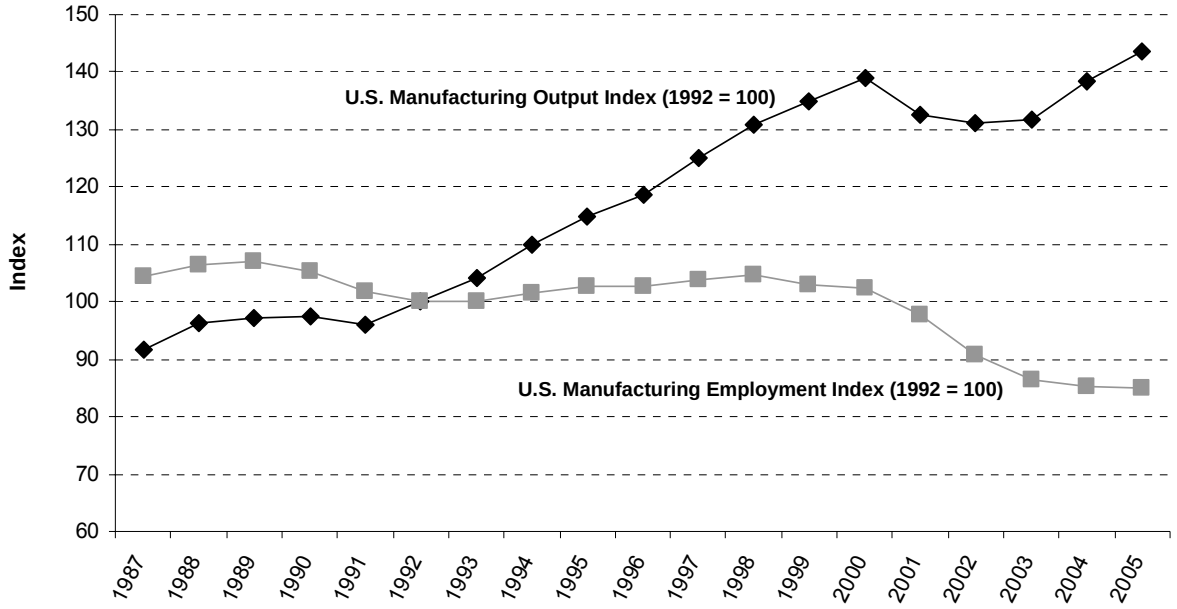
Technology Has Allowed Increased Productivity With Less Labor

At least some of the decline in manufacturing sector employment can be attributed to advances in manufacturing technology that have allowed companies to be more productive. Process improvements and the infusion of automation and computer-based technology into manufacturing processes have contributed to a striking increase in the productivity of the manufacturing sector. Between 1995 and 2005, U.S. manufacturing output per person increased more than 50 percent. This productivity gain has occurred during a time when demand for manufactured goods as a percent of GDP has been relatively stable. Without a commensurate increase in demand to match productivity gains, manufacturing firms are meeting demand by relying on new technology rather than people, resulting in increased output and decreased employment (Figure 5).

This trend in the relationship between employment and output is not unique to the United States. Many western European countries and Japan have experienced the same phenomenon (Figure 6). In all countries shown, other than Canada, employment has declined while output per hour in the manufacturing sector has risen substantially—more than offsetting the employment decline and thus enabling increased output. This is strong evidence that the job declines in the manufacturing sector are not the result of increased U.S regulation but more likely a global macro-economic trend driven by technological improvements.

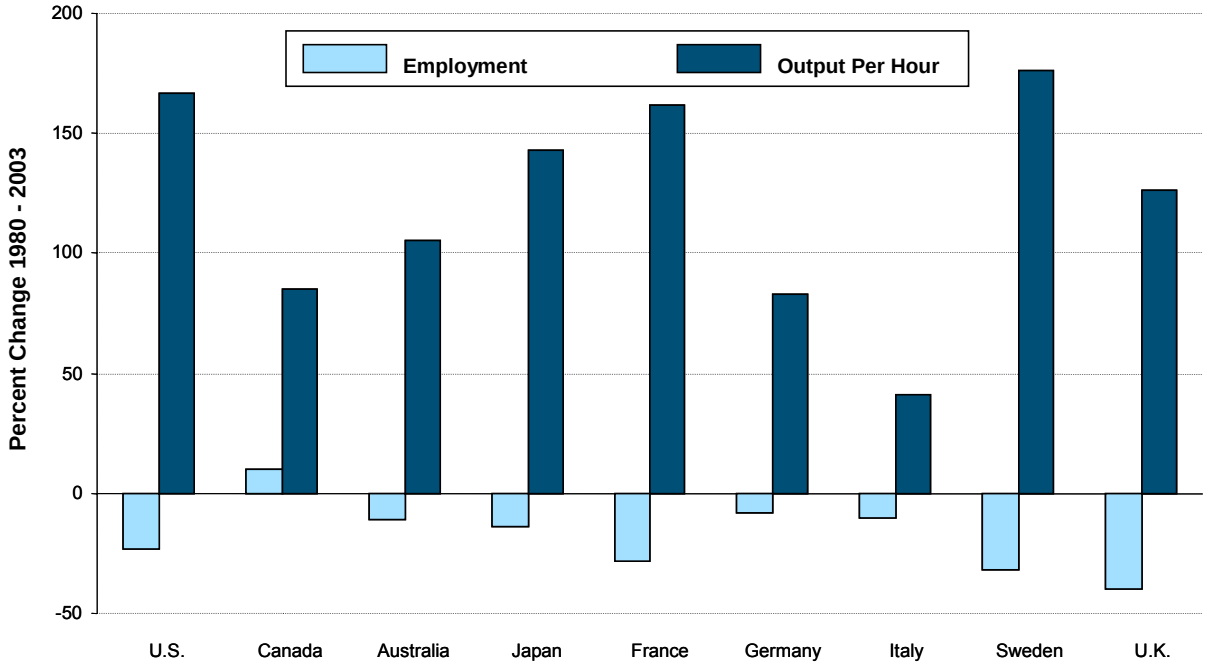
Employment declines of the last decade are part of a much longer-term trend for U.S. manufacturing. For example, the Tax Foundation notes that manufacturing has not been an area of growth for the domestic economy in the last 50 years. Between 1947 and 2003, manufacturing employment has fallen from about one-third of non-farm domestic payroll to about 12 percent.

Figure 5: Manufacturing Output Has Climbed While Employment Has Declined



Source: Major Sector Productivity and Cost Indexes, U.S. Bureau of Labor Statistics.

Figure 6: Other Countries' Manufacturing Sectors Have Also Experienced Output Gains and Employment Declines



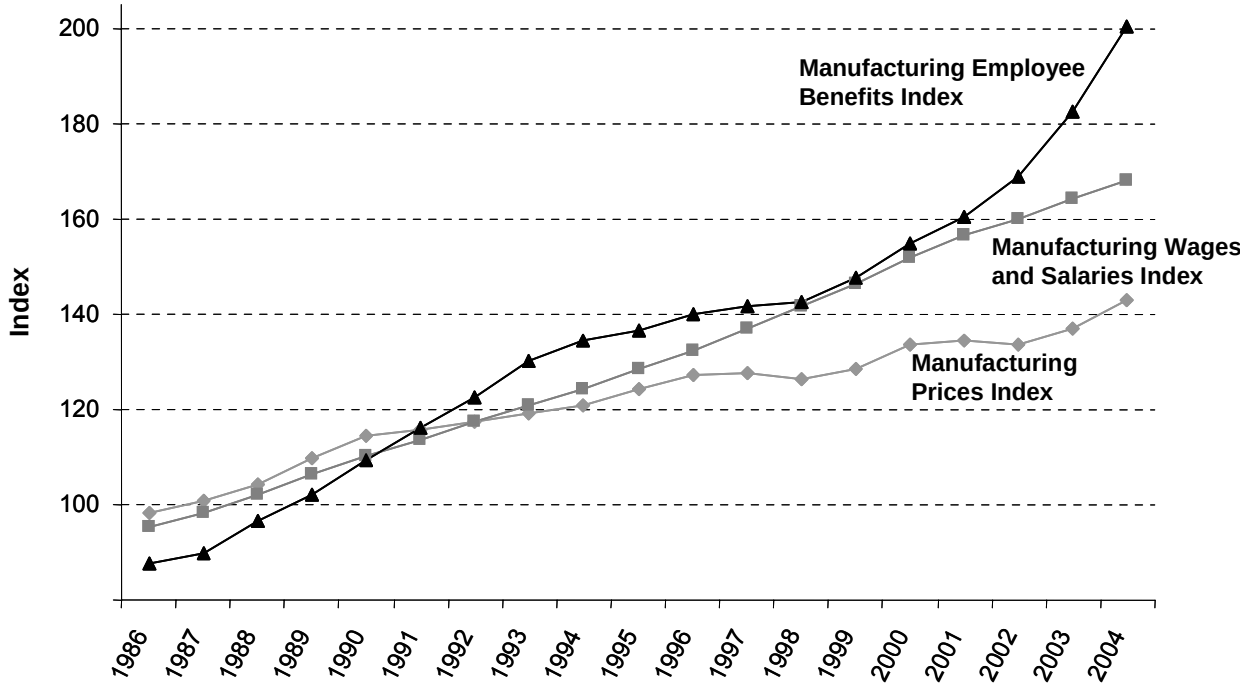
Source: U.S. Bureau of Labor Statistics.

Manufacturing Labor Costs Have Increased

Another significant trend affecting the U.S. manufacturing sector is steadily rising labor costs that have outpaced the ability to raise prices. A graph of the changes in manufacturing benefits, wages and salaries, and prices over time reveals this trend (Figure 7). On the cost side, increases in benefits (especially health care costs) and wages and salaries have made labor costs higher for manufacturing firms. Manufacturing labor costs have increased an inflation-adjusted 26.3 percent between 1986 and 2004. In 2005, the average manufacturing wage in Virginia was $851 per week. This was slightly above the statewide average wage of $813 per week, higher than construction at $772 and trade, transportation, and utilities at $653.

The increased competition of imported goods mentioned above has made it more difficult for domestic manufacturers to offset these labor cost increases by raising prices. Moreover, manufacturing wages in countries that are driving the growth in imports, particularly China and Mexico, are substantially lower than the average of $22.87 per hour paid in the United States or the average wage in other developed countries (Table 5). This wage disparity compounds the effect of the increase in U.S. labor costs on domestic manufacturing companies trying to compete in the global markets.

Figure 7: Labor Costs Have Outpaced Pricing Power



Source: JLARC staff analysis of various U.S. Bureau of Labor Statistics and U.S. Department of Commerce data sets.

Table 5: Other Countries' Share of U.S. Imported Goods and Manufacturing Wages

Country	Share of U.S. Imported Goods	Average Manufacturing Wages Paid (2006 U.S. $ per hour)
United States	-	$22.87
Canada	17.5%	21.42
China	14.0	0.57
Mexico	10.8	2.50
Japan	8.1	21.90
Germany	5.0	32.53
United Kingdom	2.9	24.71
Korea	2.5	11.52

Sources: Foreign Trade Statistics and Hourly Compensation Costs for Production Workers in Manufacturing, U.S. Census Bureau. *Monthly Labor Review*, August 2005.

Initiatives Designed to Alleviate Burden on Manufacturing Companies

In addition to economic trends, several initiatives have focused on the condition of the manufacturing sector. Chief among these is the attempt, both nationwide and in Virginia, to streamline the overall regulatory framework for many sectors of the economy. There have also been more recent efforts to address the decline in manufacturing employment through special programs and initiatives.

Nationwide Efforts to Increase Regulatory Flexibility and Reduce Adversarial Oversight. Over the last decade or more, federal regulatory agencies have attempted to make regulations more flexible and enforcement less adversarial. This trend is particularly apparent for environmental and workplace regulations. For example, the use of maximum achievable control technology and permit-trading provisions in federal air regulations has shifted the regulatory focus from being prescriptive about the process by which companies reduce emissions to the outcome or total amount of emissions in a given area. This shift has allowed companies to take a more market-based approach to emissions reductions, which is less burdensome than specific government direction about how to reduce emissions.

Similar changes have occurred for federal workplace regulations, especially in how federal agencies enforce these regulations. For example, there has been a strong emphasis on voluntary compliance initiatives, strategic partnerships between government and certain companies, and outreach and compliance assistance. Each of these efforts is designed to take a less adversarial approach to regulation, which again is generally less burdensome to companies than other approaches.

The last decade in Virginia has been characterized by a strong focus on efficient regulation.

Virginia Efforts to Streamline Existing Regulations and Ensure New Regulations Impose Minimal Burden. According to both Department of Planning and Budget (DPB) and other State agency officials, the last decade in Virginia has been characterized by a strong focus on efficient regulation, in which the presumption has been that regulations that are more stringent than federal requirements will not be adopted or allowed to remain in force absent a compelling case for them. A series of executive orders set the framework for this approach. Executive Order 13 issued by Governor Allen identified five principles for regulation, including one stating that "no regulation will be promulgated if there are less burdensome or less intrusive alternatives available to state agencies …". Executive Orders 25, 21, and 36 under Governors Gilmore, Warner, and Kaine, respectively, set a similar tone. In response to an executive order by Governor Allen, Virginia's agencies identified over 1,000 regulations that could be terminated or amended. Some of these regulations have since been changed, and periodically there are initiatives to reassess the regulatory framework for improvement opportunities. These include a 2005 collaborative initiative between companies and the Department of Environmental Quality to improve Virginia's permitting and compliance process and a 2006 initiative by the Attorney General to assess and reform Virginia's regulations.

Virginia also has several ongoing State-level programs designed to foster partnerships between the State and companies and by extension improve regulatory compliance and reduce the regulatory burden, such as the Voluntary Protection Program for occupational safety and health regulations. In addition, DPB has an Economic and Regulatory Analysis Division that is charged with conducting economic impact analyses on all proposed changes to all non-exempt regulations being proposed by executive branch agencies, including all secretariats except Technology. These analyses attempt to estimate the impact of the regulation and are published in the Virginia Register of Regulations during the regulatory process.

Response to Recent Decline in Manufacturing Jobs. The decline in the number of manufacturing jobs has not gone unnoticed. Advocacy groups, as well as the federal and Virginia governments, have in recent years brought attention to the issue. For example, in 2003, the U.S. Department of Commerce launched its "manufacturing initiative" by creating a special division to focus on manufacturing. This division held roundtable events with manufacturing companies and created a six-point plan to strengthen the manufacturing sector. The plan includes making health care costs more affordable, ensuring an affordable and reliable energy supply, and streamlining regulations and reporting requirements.

In Virginia, the 2005 General Assembly passed Senate Joint Resolution 361, which created a subcommittee to address manufacturing issues. This subcommittee worked with the Virginia Manufacturers Association to have Ernst & Young conduct a study of the tax payment burden for manufacturing compared to other sectors and other states. The subcommittee's work also was the basis for several bills introduced during the 2006 General Assembly. One of these bills included the creation of a Manufacturing Development Commission, which is again charged with examining issues confronting the sector in Virginia.

REGULATORY IMPACT ESTIMATES HAVE A HIGH DEGREE OF UNCERTAINTY

Against the backdrop of these other initiatives in Virginia, Senate Joint Resolution 360 directed JLARC staff to measure regulatory compliance costs for Virginia manufacturers. The regulatory impact estimates provided in this report were developed using the most appropriate information available, including existing estimates from federal agencies, academic and other organizations, and Virginia manufacturing companies. This comprehensive approach resulted in useful and defensible estimates, especially when viewed in the context of other previous attempts at similar studies (see gray box at left).

Previous Attempts at Similar Studies

The U.S. Government Accountability Office and another state's legislative oversight organization have previously attempted similar studies. These studies met with significant challenges, which JLARC staff have used as lessons learned to inform the methodology for this study. An overview of these previous attempts and additional methodological information are provided in Appendix B.

However, it should be noted that there is an inherent level of uncertainty to estimating the impact of regulation, particularly when compared to other types of estimates or projections. Perhaps the most fundamental driver of uncertainty is the inability to compare these estimates to actual data to determine whether the estimates are correct. (In the case of revenue forecasting estimates, for example, the estimates can be compared later against actual results.) This factor makes confirming whether any impact estimates are the "right" estimates very challenging.

Three other major methodological limitations apply to all estimates of regulatory impact. First, it is challenging to establish a baseline against which to compare regulatory benefits and costs. Establishing this baseline would require knowing what negative events were avoided because of regulation and, alternatively, what costs companies would still have incurred in the absence of regulation. Second, attributing changes in behavior to regulations requires assuming a strong cause-and-effect relationship between regulatory requirements and companies behaving differently. This cause-and-effect relationship is especially difficult to assess because companies alter their activities for various reasons, including because addressing the issue is a corporate priority or to enhance the public's perception of the company. Finally, precisely

measuring the impact of regulations presents difficulties as well. Determining benefits requires deciding how far in the future to project that benefits accrue while determining costs requires deciding whether to measure cumulative costs or ongoing annual costs.

Table 6 provides examples from the chapters that follow that illustrate these methodological limitations. The remaining chapters of this report should be considered within the context of these limitations. Other methodological details are provided in Appendix B.

Table 6: Methodological Limitations of Estimating the Impact of Regulation

Methodological Limitation	Difficult to Estimate Benefits Because Have to Determine ...	Difficult to Estimate Costs Because Have to Determine ...
Establishing a Baseline or Counterfactual for Comparison	• ...the nature of negative events that might have occurred or the likelihood and value of costs avoided or mitigated.	• ... what companies would have done without regulation.
	Example: How many harmful food products would have entered the marketplace if Virginia did not have regulatory standards for meat and poultry?	Example: How much would pharmaceutical companies spend on testing drug products prior to entering the marketplace if regulations requiring the tests were not in place?
Attributing Changes to Regulations	• ...the cause-and-effect relationship between regulation and the intended changes in company behavior or actions that are observed.	• ... the cause-and-effect relationship between observing actions taken and costs incurred, and regulation. • ... what assumptions to make about compliance levels.
	Example: What role have Virginia's occupational safety and health regulations played in the annual rise or decline in workplace accidents?	Example: What role have workplace safety regulations played in companies' decisions to purchase personal protective equipment for employees?
Precisely Measuring Impact	• ... the time period over which to calculate benefits. • ... the magnitude of benefits because the recipients are usually highly dispersed, making accurate measurement difficult.	• ... whether to measure cumulative or annual costs. • ... whether to measure one-time costs and/or ongoing costs.
	Example: How many years into the future should benefits from the 1970 Clean Air Act be calculated?	Example: How should environmental control equipment purchased in 2002 be included, if at all, in environmental compliance costs for 2005?

Source: JLARC staff analysis of government and academic documents on regulatory impact analysis. See Appendix E for a bibliography of sources.

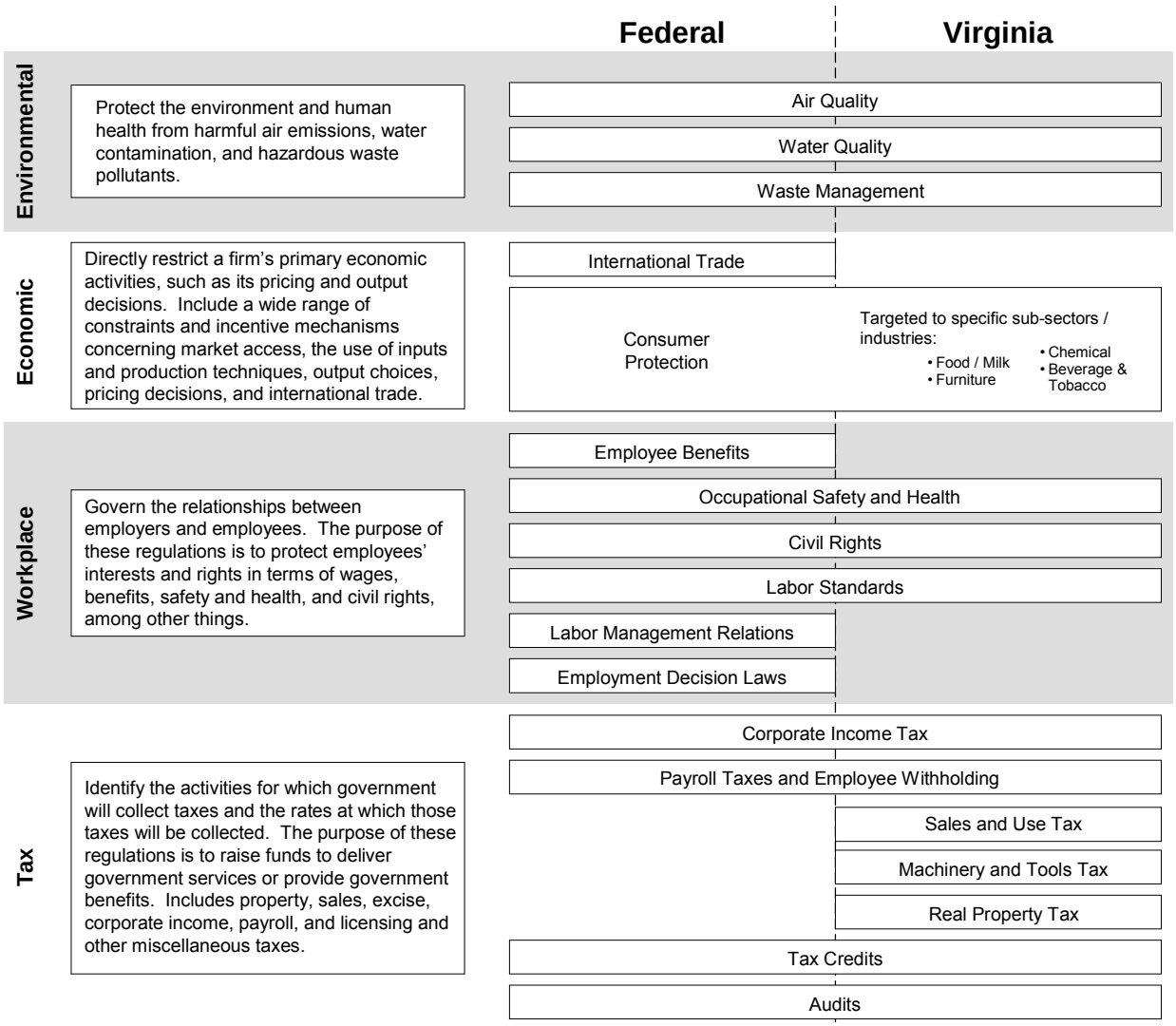
REGULATORY IMPACTS INCLUDE COSTS AND BENEFITS

SJR 360 directs JLARC staff to study the comparative burden of regulatory compliance. For this study, JLARC staff are defining burden as the impact of regulation. Impact is defined as both the costs that companies incur to comply with regulation and the benefits that accrue to the natural environment, local communities, consumers, workers, and manufacturers themselves.

Regulating Manufacturers in Virginia

Figure 8 identifies the groups of federal and Virginia regulations reviewed in this study: environmental, economic, workplace, and

Figure 8: Groups of Regulations Included in JLARC Staff Review



Source: JLARC staff analysis of federal and State agency and academic documentation.

tax. Environmental regulations exist to protect the environment and human health from air pollution, water contamination, and hazardous waste. Environmental regulations that apply to manufacturers can be grouped into three major categories. These categories are described in more detail in Chapter 2 which discusses the cost of environmental regulations.

Economic regulations address trade barriers and safeguard American industries and jobs against unfair trade; protect consumers from unsafe products, foods, and drugs; ensure stable prices for certain agricultural products, such as milk; and prohibit unfair competition. Economic regulations that apply to manufacturers can be grouped into two major categories. These categories are described in more detail in Chapter 3 which discusses the costs of economic regulations.

Workplace regulations govern the relationships between employers and employees. The purpose of these regulations is to protect employees' interests and rights in terms of wages, benefits, safety and health, and civil rights. Workplace regulations that apply to manufacturers can be grouped into six major categories. These categories are described in more detail in Chapter 4 which discusses the cost of workplace regulations.

Finally, tax regulations provide the rules to collect tax revenue that funds various government activities. Tax regulations define what activities are taxed, the rate of taxation, and the manner in which those taxes are remitted to the government. Seven categories of federal and Virginia tax regulations are the major drivers of compliance costs for manufacturing companies. These categories are described in more detail in Chapter 5 which discusses tax compliance costs.

Nationwide, Manufacturers Have Concerns About the Impact of Regulations on Production and Product Costs

SJR 360 cites a 2003 study by the Manufacturers Alliance that concludes manufacturers are at a disadvantage when competing with producers in other countries. The study cites numerous factors, including comparatively high labor costs, taxes, energy costs, tort litigation, and regulatory compliance. The study mandate noted that nationwide, manufacturers spend approximately $160 billion complying with regulations, which is the equivalent of a 12 percent excise tax on manufacturing production. Concern about these compliance costs and their impact on manufacturers was one of the reasons behind the joint resolution requesting this study.

Without question, complying with regulations adds costs for manufacturers. This cost is most evident in changes companies must

make in their processes to comply with regulation. Specific types of changes, such as purchasing pollution abatement equipment or introducing worker safety standards into production processes, will be discussed in more detail throughout this report. Unless manufacturers can fully pass along these types of costs to comply with regulations to consumers, companies usually bear a greater portion of the costs and reap a smaller portion of the benefits. However, from society's perspective, the net benefit or cost of regulations is most important.

From society's perspective, the net benefit or cost of regulations is most important.

Regulations Benefit the Public and, In Some Instances, Manufacturers

The long-term and public nature of the regulatory process generally ensures that regulations have a purpose. These purposes can be wide-ranging. However, regulations generally proactively or reactively attempt to change conditions or behavior that, through the legislative and regulatory process, have been deemed necessary for government to address. Government has created regulation that applies to manufacturers in this respect because of the sector's impact on the environment or hazardous nature of working in the manufacturing sector. For example, in 2001, five of the top ten point sources of pollution in Virginia were manufacturing companies (the other five were electric utility companies). Additionally, more than one in five injury and illness cases in private industry occur in the manufacturing sector.

Some Cost-Benefit Analyses of Environmental and Workplace Regulations Suggest that Benefits Exceed Costs. Estimating the monetary benefits and costs of a single regulation can be complex. Simultaneously estimating aggregate benefits and costs for many regulations is even more difficult. As discussed earlier, there are major methodological limitations to estimating the impact of regulation. Despite these limitations, however, there are existing monetized estimates of the benefits and the costs of federal regulation. The most centralized, comprehensive source of these estimates is the U.S. Office of Management and Budget (OMB) series of Reports to Congress on the Costs and Benefits of Federal Regulations. These reports summarize cost and benefit estimates provided by both federal agencies and academicians. Table 7 summarizes these estimates for environmental and workplace regulations that apply most directly to manufacturers.

OMB Reports

Since the late 1990s, Congress has directed the Office of Management and Budget to annually submit "estimates of the total annual costs and benefits of federal regulatory programs, including quantitative and non-quantitative measures of regulatory costs and benefits."

For both environmental and workplace regulations, the estimated monetized benefits are usually greater than the estimated costs. In fact, there are only two timeframes in Table 7 for which the benefits do not outweigh the costs. For all other time periods, the range of benefits outweighs the range of costs.

Table 7: Federal Agency Estimates of Benefits Are Usually Greater Than Estimates of Costs (Millions of 2005 Dollars)

		Year Regulations Initiated						
		Before 1988	1988-2000	2001	2002	2003	2004	2005
Environmental	Costs	$67,561 to 123,861	$88,830	$14,238 to 16,029	$240	$450	$2,577 to 4,017	$3,264 to 4,220
	Benefits	27,525 to 1,814,126	93,834 to 181,413	31,701 to 70,239	1,564 to 6,028	255 to 444	13,681 to 125,992	18,156 to 202,316
	Net Benefits	-96,336 to 1,746,565	5,004 to 92,583	15,672 to 56,001	1,324 to 5,788	-195 to -6	9,664 to 123,414	13,936 to 199,052
Workplace	Costs	$13,762 to 15,013	$8,758	$98	<----------n/a---------->			
	Benefits	n/a	35,031 to 37,534	209	<----------n/a---------->			
	Net Benefits	-	26,274 to 28,776	111	<----------n/a---------->			

Note: No estimates for economic regulations are shown because no economic regulations that apply directly to manufacturers were included in the summary OMB reports. No estimates for tax regulation are included because OMB includes no monetized estimates of the benefits of tax compliance.

Source: U.S. Office of Management and Budget Reports to Congress on the Costs and Benefits of Federal Regulations 2000, 2001, 2002, 2003, 2004, 2005 and 2006 (draft). The CPI-U index was used to inflate the dollars reported to 2005 dollars. The range of net benefits was calculated by (1) subtracting the higher cost value from the lower benefit value and (2) subtracting the lower cost value from the higher benefit value.

Table 7 includes only national, all-sector costs and benefits for these selected groups of federal regulations. This is because for State regulations, the DPB economic impact analyses typically do not include monetized estimates of the total expected benefits and costs of the regulation. DPB indicates that this is primarily due to the inherent subjectivity in making such projections, especially within the 45-day time period stipulated in the Administrative Process Act. Instead, DPB's impact analyses often focus on which groups in Virginia may be impacted by Virginia regulations and discuss the different types of impact. However, DPB economic impact analyses typically include some level of cost estimates.

Documented Examples Further Demonstrate the Benefits and Importance of Regulation. Generally, the benefits of complying with regulation accrue to portions of society other than manufacturing companies themselves. The examples of benefits from regulation that applies to manufacturers shown in Table 8 illustrate this dynamic.

In Virginia, there are historical examples that illustrate the importance of regulation. For example, in 1975, EPA sampled the lower James River and found widespread contamination from kepone, a toxic insecticide formerly used in the manufacturing of ant

Table 8: Documented Examples of Benefits of Regulations Impacting Manufacturers

	Type of Benefit	Magnitude of Benefit	Recipient of Benefit: Natural Environment	Local Communities	Consumers	Workers	Manufacturers
Environmental	Fewer tons of volatile organic compound and nitrogen oxides pollutants emitted (1990 - 2010 projected)	2,100,000	☑				
	Hazardous lead, benzene, and cadmium waste sites controlled (1980 - 2005)	540	☑				
	Premature deaths avoided (annual)	1,600		☑			
	Nonfatal heart attacks avoided (annual)	2,200		☑			
	Cases of chronic asthma avoided (annual)	7,200		☑			
	Cases of chronic bronchitis avoided (annual)	20,000		☑			
	Lost work days avoided (annual)	170,000				☑	☑
Economic	Passenger car and light truck-related deaths avoided (1960 - 2002)	326,370			☑		
	Deaths avoided from improved food labeling (annual)	250 to 500			☑		
	Deaths avoided from safer medical devices (annual)	36 to 44			☑		
	Heart attacks avoided (annual)	600 to 1,200			☑		
Workplace	Deaths from cancer, head injury, and disease avoided (annual)	2,009				☑	
	Lost workdays avoided (annual)	1,028,555				☑	☑
	Injuries and illnesses avoided (annual)	96,220				☑	
	Retirees receiving pension benefits despite failure of private company plan (annual)	683,000				☑	

Sources: JLARC staff analysis of U.S. Environmental Protection Agency, National Highway Traffic Safety Administration, Food and Drug Administration, and Occupational Safety and Health regulatory analysis documents. All estimates are projections based on nationwide implementation of regulations and are for regulations that directly impact the manufacturing sector. Wherever possible, the benefits counted are associated solely or primarily with regulatory compliance by companies in the manufacturing sector, but on a national scale.

and roach traps. The chemical was detected in the river's water, bottom sediments, and the tissue of fish, shellfish, and blue crabs.

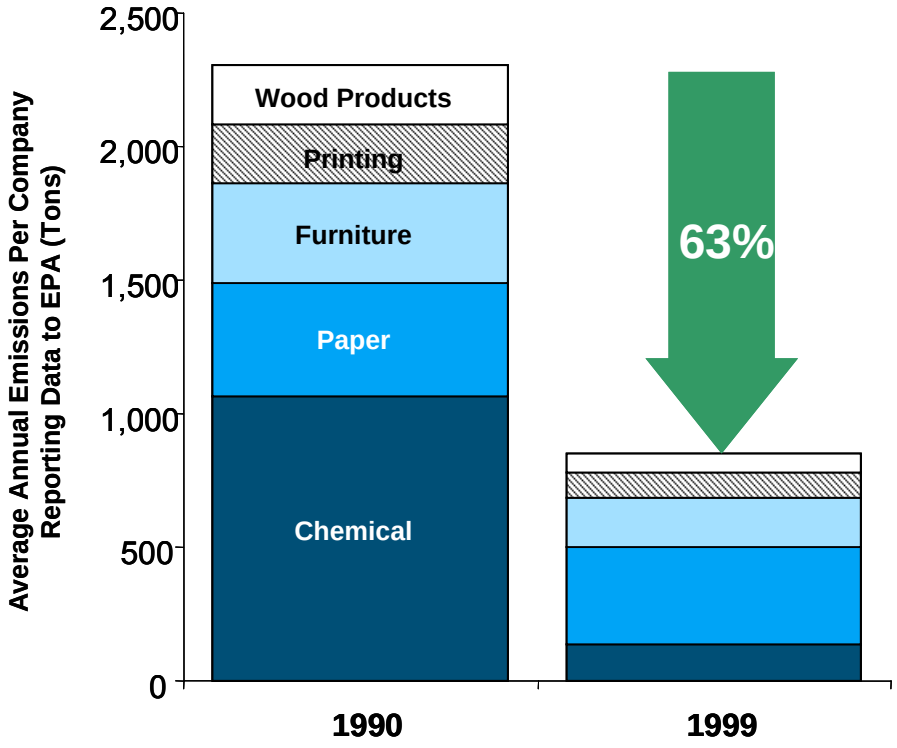
Subsequent investigation found that a manufacturer routinely disposed of kepone down storm drains and through the Hopewell sewage plant. The contamination led to the closing of the James River and its tidal tributaries to commercial and sport fishing. Kepone is still present in the river today, although at levels considered safe by the U.S. Food and Drug Administration. However, as of 2006, the State Health Department still advises against eating large amounts of fish from the river.

Regulations created in response to concerns such as these and many others appear to have had a positive impact. For example, the 1990 Clean Air Act amendments focused on, among other

things, reducing the levels and incidence of volatile organic compound (VOC) emissions. These compounds are a major contributor to smog. As shown in Figure 9, since the passage of those 1990 amendments, VOC emissions from Virginia's five largest manufacturing sub-sectors have been dramatically reduced.

Another compelling example of the positive changes associated with regulation is the reduction in workplace fatalities since the passage of the Occupational Safety and Health Act in 1970, as shown in Figure 10. While several academicians conclude that OSHA activities have minimal impact on actual worker safety, fatalities as a percent of the workforce in the manufacturing sector have declined by two-thirds since 1970.

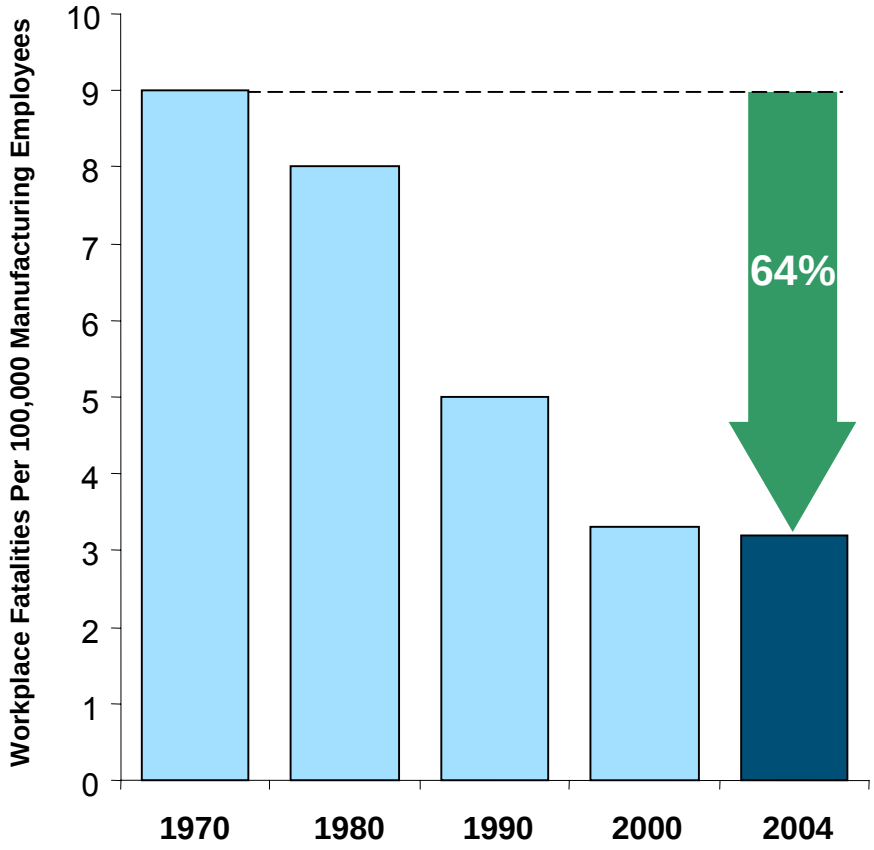
Figure 9: Average Volatile Organic Compound Emissions Have Declined Since Last Major Revision to Federal Clean Air Act (1990)



Note: Manufacturing sub-sectors shown were the five largest producers of emissions within the sector when the U.S. Environmental Protection Agency began collecting data in 1990. 1999 is the most recent year for which data is available.

Source: JLARC staff analysis of U.S. Environmental Protection Agency data.

Figure 10: Nationwide, Workplace Fatalities in Manufacturing Have Declined Since Federal Occupational Safety and Health Act (1970)



Source: 1970, 1980, and 1990 data, National Safety Council. 2000 and 2004, Census of Fatal Occupational Injuries, Bureau of Labor Statistics.

Some Manufacturers Recognize Benefits and Go Beyond Minimum Regulatory Requirements. Particularly in the environmental and workplace areas, companies recognize the benefits of regulation to society and in some cases to themselves. In some instances, these companies go beyond minimum regulatory requirements. For example, companies increasingly indicate that implementing "green" processes and technology yields not only a cleaner environment but also increases operational efficiency and more cost-effective business processes. Virginia's Environmental Excellence Award program highlights companies that have successfully implemented these "win-win" situations. For example, a large food manufacturer received the award for installing equipment to remove residual solids from the sludge process of its wastewater treatment system. The new equipment removes up to 100 wet tons of residual solids from the wastewater system each week, reducing the impact on the surrounding waters. At the same time, this equipment in-

creased the efficiency of the wastewater treatment system, resulting in a 53 percent, or 85,577 pound, annual reduction in nitrate compounds. The equipment also saves approximately 10 million gallons of water annually. Furthermore, the equipment is saving the company more than $100,000 each year because of the more efficient residual solid removal process and water-use savings.

Similarly, some companies believe that occupational safety and health regulations have such large benefits that they choose to go above and beyond what is minimally required. Virginia's Voluntary Protection Program (VPP) highlights companies that implement worker safety provisions well beyond minimal federal and State requirements. For example, in 1998, a chemical company in Virginia had 14 recordable workplace accident cases and eight lost workday incident cases. By 2001, after incorporating the VPP safety elements into its work processes, the company's safety record had improved dramatically to only one workplace accident case and no lost workdays. The company noted that these safety improvements not only keep its workers safer but have helped increase employee morale—the turnover rate has declined by 52 percent—and coincided with an increase in operating efficiency. According to a company official, "We wouldn't do business any differently if people stopped watching."

According to a company official, "We wouldn't do business any differently if people stopped watching."

REPORT ORGANIZATION

While regulations have both benefits and costs, the remaining chapters of this report focus on estimating the cost impacts associated with regulations as directed in SJR 360. Chapters 2 through 5 address the cost impacts of environmental, economic, workplace, and tax regulations, respectively. A final chapter summarizes the cost findings from the chapters and discusses some conclusions that can be drawn by considering the broader circumstances currently facing manufacturers and the impact of regulations upon them.

Chapter 2

Costs and Comparisons for Environmental Regulations

In Summary

Of the four regulatory areas assessed by JLARC staff during this review, environmental regulations are the most costly for manufacturers. The estimated direct costs for Virginia manufacturers to comply with environmental regulations were approximately $606 million in 2005. In addition, if other types of costs are added, such as disrupted productivity due to complying with environmental regulations, the costs may be placed as high as $1.72 billion. Virginia manufacturing companies provided information to JLARC staff about their compliance costs, which varied widely depending on factors including the company's sub-sector and size. Virginia's environmental regulations are based largely on federal mandates. Of the environmental regulations that Virginia adds to federal requirements, none were rated as having a large impact on manufacturers. These regulations were primarily initiated to protect the quality and quantity of the State's natural resources. However, companies did identify several issues with environmental regulations that may be worthy of further analysis and consideration.

Environmental regulations control the amount of pollution emissions released into the air, water, and land. The purpose of these regulations is to protect the environment and ensure the health and safety of the public. For the manufacturing sector, pollution emissions are controlled when a company uses less hazardous materials in its manufacturing processes or when the manufacturing process is changed by installing equipment to reduce pollutants in discharges before they escape into the environment.

COSTS TO VIRGINIA MANUFACTURERS OF COMPLYING WITH ENVIRONMENTAL REGULATIONS

To determine the cost to Virginia manufacturers of complying with environmental regulations, JLARC staff analyzed existing estimates, conducted case studies with Virginia manufacturing companies, and analyzed data from a survey of Virginia manufacturers. Four federal statutes form the basis of federal environmental regulations (Table 9). Virginia's environmental regulations, as shown in Appendix C, include 20 major federal regulations and 19 Virginia regulations that apply to the manufacturing sector. This collective framework of regulations was the basis of the JLARC staff analysis of compliance costs.

Table 9: Four Federal Environmental Statutes Can Be Grouped Into Three Categories

Type of Environmental Regulation	Description	Federal Statutes Applicable to Manufacturers
Air Quality	Establishes the basic structure to improve air quality	• Clean Air Act
Water Quality	Establishes the basic structure to protect water quality by reducing direct pollutant discharges into waterways and managing polluted runoff	• Clean Water Act
Waste Management	Establishes the basic structure for hazardous and non-hazardous waste disposal, recycling and recovery activities, and waste reduction and cleanup	• Resource Conservation and Recovery Act • Hazardous Materials Transportation Act

Source: U.S. Environmental Protection Agency.

JLARC Staff Identified and Adjusted Existing Estimates of Environmental Compliance Costs

Cost Estimate Approaches

To the extent feasible, in this chapter and subsequent cost chapters of this report, separate estimates are provided for direct costs and other types of costs. The analysis and estimates for direct costs are identified under "Approach #1." The analysis and estimates for direct costs and other types of costs are "Approach #2."

Estimating the costs to manufacturers of complying with environmental regulations is challenging because some of the existing estimates only include direct cost expenditures while others incorporate other types of costs. Distinguishing between direct expenditures and other costs is an important step in developing a cost estimate of environmental regulatory compliance because of the fundamental difference between these two types of costs. In general, direct expenditures include the capital expenditures and operating costs incurred by companies to comply with environmental regulations. Direct expenditures for environmental regulations typically include the staff time required to comply with regulations, paying permit fees and penalties, and buying, installing, and maintaining pollution-control equipment (Table 10). Figure 11 shows examples of pollution-control equipment purchased by manufacturers to comply with environmental regulations.

Other costs are those that may result from regulatory compliance but are not necessarily expenditures made directly by manufacturing companies. These costs typically include opportunity costs associated with redirected investments and reduced operating flexibility. Other costs also stem from corporate decision-making affected by regulation, such as not capitalizing on technological advancements that could increase production but also increase pollution and subsequent compliance costs.

Table 10: Examples of Direct Expenditures and Other Costs to Manufacturers of Complying with Environmental Regulations

Direct Expenditures				Other Costs	
Staff Time	**Fees and Penalties**	**Operating Costs**	**Capital Expenditures**	**Opportunity Costs**	**Special Costs**
• Filling out permit applications • Reporting emissions levels to state or federal agencies • Evaluation of pollution releases according to regulatory mandate • Legal and other paperwork	• Operating permit fees • Fines and penalties for environmental noncompliance	• Maintenance of pollution-control equipment • Monitoring and testing of pollution emissions • Costs to administer pollution-control programs	• Purchase and installation of pollution-control equipment	• Disrupted productivity due to compliance with pollution controls	• Altered decision-making due to regulatory requirements

Source: JLARC staff analysis of U.S. Environmental Protection Agency documents and other regulatory analysis literature.

Figure 11: Examples of Pollution-Control Equipment Used by Manufacturers

Nitric Acid Emission Control Exhaust System

Example of vertical fume scrubbers used by a semiconductor manufacturer. Absorbs nitric acid that is a by-product of manufacturing processes.

Zero Liquid Discharge

Example of equipment that eliminates liquid waste from water or vapor streams produced by manufacturers such as those in the chemical and paper industries. Treated water can be reused, reducing the facility's water consumption.

Emission Control Exhaust System

Example of a fume scrubber with self-contained re-circulation and fan unit, used by a semi-conductor wafer manufacturer.

Submicron Particulate and Oil Mist-Generated Scrubber

Example of scrubber used by a plastics manufacturing company. Uses activated carbon absorption to capture volatile organic compound (VOC) emissions.

Source: Various pollution-control equipment manufacturers and environmental management service providers.

To estimate the direct and other costs to Virginia manufacturers of complying with environmental regulations, JLARC staff completed three steps:

Step 1: Review, Analyze, and Categorize Existing Cost Estimates. JLARC staff reviewed and analyzed existing agency, academic, and other cost estimates to determine the type of expenditures (direct or all other) that were included in the cost estimate. The U.S. Census Pollution Abatement Cost Expenditures (PACE) survey provides direct environmental compliance costs expenditures for manufacturers. In addition, the Small Business Association's (SBA) *Impact of Regulatory Costs on Small Firms* report provides an alternative estimate which includes both direct expenditures and other costs.

Step 2: Inflate the Cost Estimates Into 2005 Dollars. JLARC staff worked with the U.S. Census Bureau to update the 1999 PACE survey estimates to 2005 dollars. The Consumer Price Index (CPI) was used to inflate operating costs. In contrast, capital expenditures were adjusted by first using data from the Census's Annual Survey of Manufacturers (ASM) to calculate the percentage that pollution abatement expenditures comprised of all manufacturing capital expenditures. This percentage was then applied to the ASM's 2004 Virginia cost of environmental compliance to determine what proportion of overall manufacturing capital expenditures in the State were attributable to pollution abatement in 2004. Finally, this figure was inflated to 2005 dollars. In addition, the SBA 2004 estimate was inflated to 2005 dollars using the CPI.

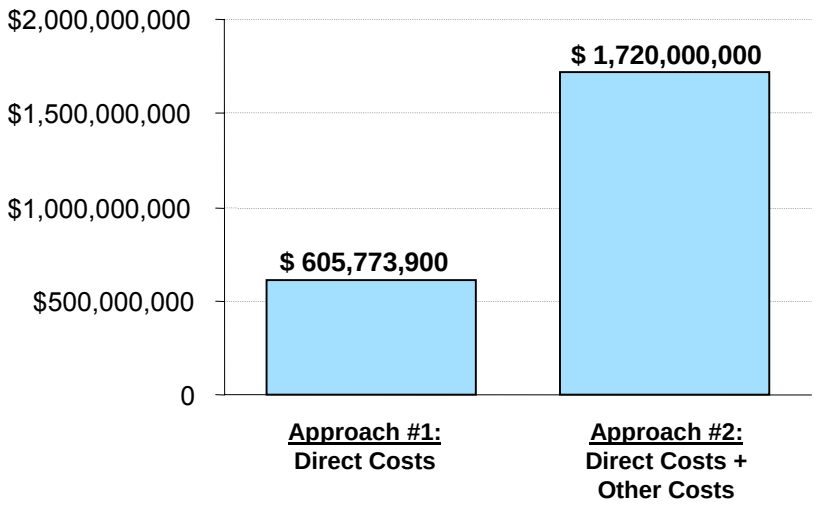
Step 3: Apportion the Inflated Cost Estimates to Manufacturing Sub-Sector-Specific or Virginia-Specific Estimates. To adjust the PACE survey data for Virginia, JLARC staff determined the percentage that each of Virginia's manufacturing sub-sectors comprised of the State's total environmental compliance costs. This percentage was then used to apportion the Virginia-specific estimates to each manufacturing sub-sector. In contrast, to calculate Virginia's share of the SBA manufacturing cost estimate for direct expenditures plus other costs, JLARC staff applied the SBA's per employee expenditures to the number of Virginia manufacturing employees.

Estimated Direct Costs Are Approximately $606 Million While Other Costs May Bring the Total to as High as $1.72 Billion

Figure 12 presents JLARC staff-adjusted estimates of the direct expenditures and other costs that manufacturers may have incurred when complying with environmental regulations in 2005.

Approach #1 includes only direct costs, which are approximately

Figure 12: Annual Costs to Virginia Manufacturers of Complying With Federal and Virginia Environmental Regulations, 2005



Source: JLARC staff analysis of Small Business Association's *Impact of Regulatory Costs on Small Firms* and The U.S. Census Pollution Abatement Cost Expenditures survey data.

$606 million. Approach #2 includes direct costs plus other costs, bringing the total to $1.72 billion. There is likely a lower degree of certainty with approach #2 because in certain instances it includes types of costs, such as disrupted productivity, that are more difficult to measure than actual expenditures made by companies. The wide variation in the estimates using the two approaches is due to the types of costs included in the estimates.

Approach #1 Includes Direct Costs to Comply With All Environmental Regulations and Is Approximately $606 Million. The direct cost estimate is derived from the JLARC staff-adjusted PACE survey data, which is company-reported compliance information on what companies spend to comply with federal, State, and local environmental regulations. The $606 million is approximately, on average, $2,050 per manufacturing employee in Virginia or about $99,000 per manufacturing company. Alternatively, for every dollar manufacturers spend on payroll, they spend on average $0.05 complying with environmental regulations.

In Virginia, average, per-employee environmental compliance costs by sub-sector in 2005 ranged from $29 for apparel to $132,891 for petroleum and coal manufacturing. The highest polluting manufacturing sub-sectors in Virginia are the chemical and paper sub-

sectors, which also have among the highest per-employee compliance costs. For most manufacturing sub-sectors, pollution abatement activities—as opposed to pollution prevention activities, disposal and recycling, permit fees, and other expenditures—represented the largest share of environmental expenditures, accounting for 57 percent of total direct expenditures. These activities include the acquisition, installation, and maintenance of end-of-pipe equipment intended to decrease pollution. But certain sub-sectors, such as the leather products and plastics and rubber products manufacturing sub-sectors, have higher disposal and recycling costs.

Approach #2 Includes Direct Costs Plus Other Costs of Complying With Federal Environmental Regulations and Totals $1.72 Billion. The direct expenditures plus all other costs estimate is derived from the JLARC staff-adjusted SBA report data. The amount of this estimate, $1.72 billion, equates to about $5,817 per employee or about $281,000 per manufacturing establishment in the State. However, the SBA estimate only includes costs attributable to federal regulations. Although the majority of the environmental regulations is at the federal level, not including state and local regulations excludes certain compliance costs. For example, some of the fees for operating permits which allow manufacturers to emit specific levels of pollution are determined and administered by state governments. In addition, localities may impose additional pollution prevention requirements that are not otherwise required by state or federal regulation.

Case Studies and Survey Results Provide Insight Into Actual Direct Expenditures for Selected Manufacturers

Direct expenditures reported by facilities likely have a higher degree of certainty—at least for that facility—than aggregate estimates of average compliance costs. JLARC staff obtained company estimates through case studies and surveys to better understand actual compliance costs for federal and Virginia environmental regulations for certain manufacturers. As noted in Chapter 1, it is difficult to determine precisely what costs should be attributed to regulations as opposed to what a company would have done without regulations. Companies' attempts to estimate their environmental compliance costs highlighted the challenges of attributing an exact amount of spending on environmental controls to regulations.

For example, one case study company reported that virtually no pollution controls would be implemented in its facility in the absence of regulations. However, three other companies stated that they would continue to conduct certain pollution prevention or disposal and recycling activities, either due to insistence from the lo-

Case Study Methodology

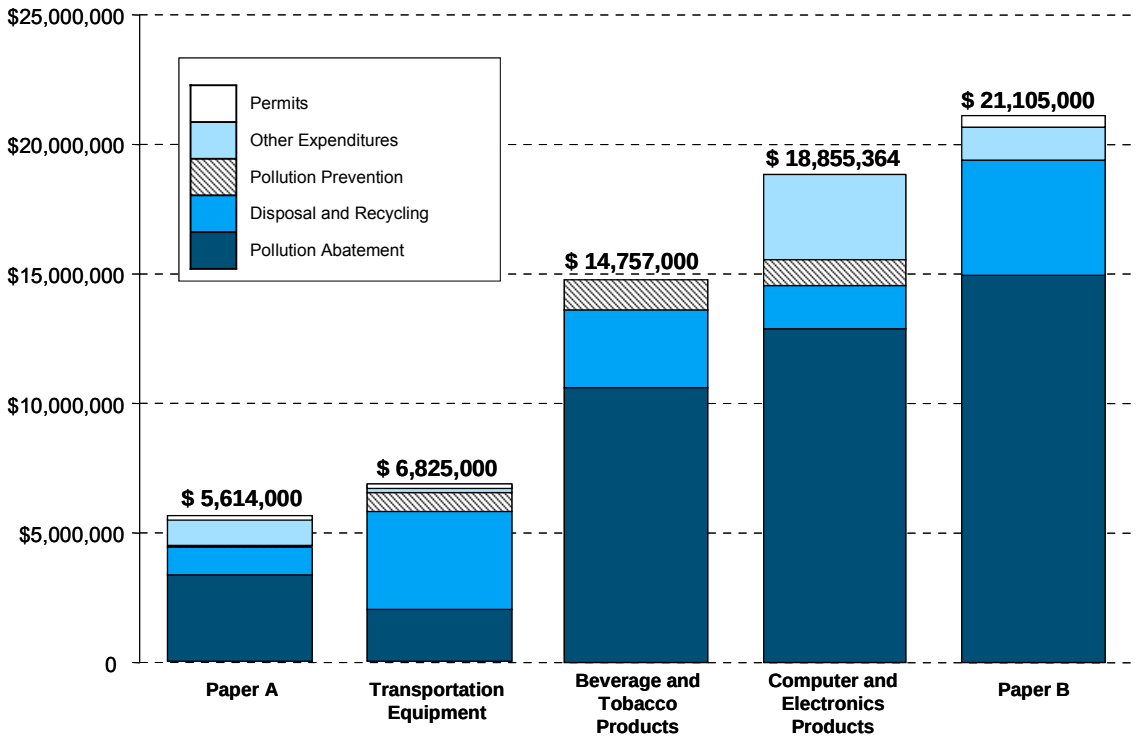
JLARC staff worked with the Virginia Manufacturers Association to identify companies willing to participate in case studies. Workbooks were provided to companies that defined the regulatory framework and included existing estimates to use as a starting point. Five Virginia manufacturers—two paper, one computer and electronics, one transportation equipment, and one beverage and tobacco products—completed workbooks. More information is provided in Appendix B.

cal community or because they provided financial benefits to the facility. While these discussions of what companies would do without regulation cannot be quantified, they are an important part of the context in which to view the company's estimates.

The case studies also highlight the difficulty of assigning specific costs to particular regulations. When JLARC staff asked case study companies and survey respondents to assign a portion of their total compliance costs to Virginia's state-initiated regulations, neither group provided any usable information. Rather, companies provided costs incurred complying with federal and Virginia environmental regulations in total.

Although the cost information provided by manufacturers to JLARC staff cannot be extrapolated to all Virginia manufacturers, it does provide insight into the direct costs of those specific companies. For example, the five case study companies spent between $5.6 and $21.1 million on environmental compliance in their most recent completed fiscal year (Figure 13). Pollution abatement was the largest expenditure for four of the five case study companies

Figure 13: Range of Annual Compliance Costs From Individual Case Study Responses, Most Recent Completed Fiscal Year



Note: For the beverage and tobacco products company, costs for permits and other expenditures are included in its remaining cost categories. For paper company B, pollution prevention costs are included in the pollution abatement cost category.

Source: JLARC staff analysis of case study responses.

while the majority of the transportation equipment company's spending was on disposal and recycling.

Figure 13 also shows that permits represented the smallest cost category for companies reporting costs for permits, comprising less than five percent of reported expenditures. Paper company B reported spending $413,900 on permits, which was about two percent of its total spending. The transportation equipment company reported spending about $25,000 on permits, which equals 0.4 percent of its total compliance costs.

The case studies also show that similar companies in the same sub-sector can spend widely different amounts on environmental compliance. For example, paper company B reported total costs of $21 million in its most recent complete fiscal year while paper company A reported $5.6 million in compliance costs. While paper company B has more employees, the wide variation is driven by other factors including the extent of on-site disposal and recycling activities, age of the facility, and amount of pollution emissions that need to be controlled. Similarly, the beverage and tobacco products company reported that its costs would vary from other companies in its sub-sector due to different equipment, raw materials, and natural resources used in its manufacturing process.

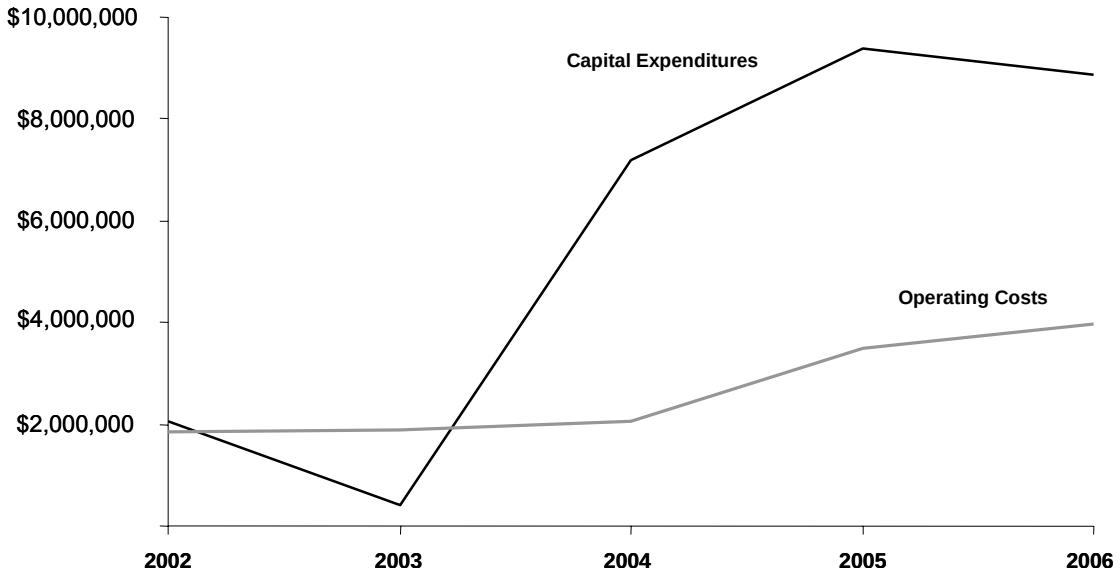
Finally, the case studies show that the year in which compliance costs are measured can lead to widely different compliance costs. This factor highlights another methodological limitation discussed in Chapter 1. For example, the computer and electronic products company reported that its capital expenditures fluctuated widely while its operating costs increased steadily over the last five years (Figure 14). If the company's compliance costs were measured in 2002, they would be much lower than the 2005 data used in this study.

Survey Methodology

JLARC staff also worked with the Virginia Manufacturers Association to develop and administer an online survey for Virginia manufacturing companies. The survey asked for regulatory compliance costs, potential improvements to Virginia's regulations, and other issues related to business decision-making. There were 63 respondents to the survey. More information is provided in Appendix B.

Results from the JLARC staff survey of Virginia manufacturers provide additional insight into environmental compliance costs. Two of the nine manufacturers providing environmental compliance costs noted that annual environmental compliance costs were greater than $1 million. The average annual cost of complying with environmental regulations for the remaining seven respondents ranges from approximately $96,000 to $206,000. Per-employee compliance cost was highest for the chemical and fabricated metal manufacturing sub-sectors, ranging from approximately $200 to $7,000. The overall average per-employee cost estimate for the nine companies was between $1,500 and $3,400, which is consistent with the average per-employee cost of $2,050 for the JLARC staff-adjusted estimates of direct expenditures discussed earlier.

Figure 14: Pollution Abatement Expenditures for Computer and Electronic Products Company Vary Widely From 2002 to 2006



Source: JLARC staff analysis of case study information.

VIRGINIA'S FRAMEWORK OF ENVIRONMENTAL REGULATIONS COMPARED TO OTHER STATES

The study mandate directed JLARC staff to compare the costs of regulatory compliance for manufacturers in Virginia to other southern and mid-Atlantic states. A direct comparison of costs was not feasible because other states do not have comparable compliance cost information. However, a comparison of the environmental regulations of each state, when placed in context, provides insight into the comparative impact that Virginia's regulations have on manufacturing companies. Furthermore, comparing Virginia's regulations to the federal regulations and those of other states provides useful information in the absence of any cost estimates for Virginia's state-initiated environmental regulations.

Other State Environmental Regulations

JLARC staff asked agency staff in Maryland, Pennsylvania, North Carolina, Tennessee, and Georgia to provide information about their states' environmental regulations. Staff were asked to (1) identify regulations in their state that were more strict than what is federally required and (2) characterize the impact of each regulation on manufacturers. More information is provided in Appendix B.

Context Needed to Understand State Environmental Regulations

When comparing states' environmental regulations, it is useful to have background information on the states. For example, the chemical and paper sub-sectors typically discharge pollutants more than other manufacturers. About 3.2 percent of Virginia's manufacturers are in the chemical sub-sector (Figure 15, p. 38). This is the lowest percentage of the other selected states, with Georgia being the highest at 5.4 percent. About 1.8 percent of Virginia's manufacturers are in the paper sub-sector, more than Maryland, but less than North Carolina, Georgia, and Tennessee.

Of all the facilities in Virginia that release toxins into the air, water, and land, the top ten facilities released 25.1 million pounds in 2001. Three-quarters of these emissions were attributable to five manufacturing facilities. Even though Virginia had the fewest pounds of releases compared to other states selected, it had the largest percentage attributable to manufacturers. For example, North Carolina's top ten polluting facilities released 84.9 million pounds of toxins in 2001, only 12 percent of which was attributable to two manufacturers. In contrast, Tennessee's top polluting facilities released 83.7 million pounds, 62 percent of which was attributable to five manufacturers.

Important context is also provided in each state's approach to regulations. For example, in 2002, Virginia enacted Executive Order 21 which establishes that "unless otherwise mandated by law, only regulations that are necessary to interpret the law or protect the public health, safety, or welfare shall be promulgated." Two previous Executive Orders set similar requirements. Maryland, North Carolina, and Pennsylvania have similar mandates.

In addition, Virginia Department of Environmental Quality (DEQ) staff indicate that, over the past five years, the agency has made a conscious effort to open the lines of communication during the regulatory process, treat industry as a customer, and streamline the regulatory process. For example, DEQ recently facilitated a "peer review report" to identify areas in which the regulatory process can be streamlined. No other state contacted indicated a similar streamlining effort in recent years.

Supplemental and Stand-Alone Regulations

Supplemental regulations are based on federal mandates. States may be required to adopt these regulations to meet federal standards, or states may adopt them to clarify or enhance federal regulation.

Stand-alone regulations are enacted by state authority alone, based on state statute, and have no supporting federal statute. Stand-alone regulations are generally developed when a state wishes to regulate an environmental issue that is not required by federal statute.

Virginia's Stand-Alone Environmental Regulations Were Not Rated as Having a Large Impact

JLARC staff worked with staff at other state environmental agencies to determine to what extent a state goes beyond minimum federal regulatory requirements. To facilitate this comparison, JLARC and DEQ staff identified three categories of environmental regulations: federal, supplemental, and stand-alone. Federal regulations are those in the U.S. Code that are initiated at the federal level and apply to all states. Because they apply to all states, these regulations were not included in the other states' review process. The remaining two categories of state-initiated regulations, described at left, were used to help characterize the extent to which states' environmental regulations go beyond federal requirements.

Stand-alone regulations provide useful information about a state's unique set of regulations because they are enacted by state authority alone with no federal precedent. Of Virginia's 10 stand-alone regulations, none were rated as having a large impact on Virginia manufacturers, according to DEQ. For the purpose of this report, im-

pact is defined as the degree (minimal, some, large) to which a regulation causes manufacturers to either change their production practices or incur costs beyond what the company would spend if the regulation did not exist. Maryland and Pennsylvania agency staff also reported that no stand-alone regulations have a large impact on manufacturers. In contrast, agency staff in Georgia and Tennessee reported that approximately 60 and 100 percent of their stand-alone regulations have a large impact on manufacturers. Figure 15 shows the number of large impact, "stand-alone" regulations for each selected state. Figure 16 lists the titles of each state's stand-alone regulations that were reported as having either some or a large impact.

The objectives of the stand-alone regulations are also relevant when comparing Virginia to other states. The most common objective of Virginia's stand-alone environmental regulations is the protection of natural resources (Figure 17). For example, the Eastern Virginia Groundwater Management Area regulation protects water resources from Hanover County to Virginia Beach. This area, which includes 13 counties and 11 cities, is one of the State's most densely populated areas and contains a large share of Virginia's industrial facilities. Therefore, due to the particularly high demand for water and the potential for polluted or diminished water resources, Virginia adopted additional controls to protect public health and ensure adequate water availability.

It is important to note that, in addition to the unique state context discussed in the previous section, differences in the way states group and organize their regulations make a cross-state unit of analysis difficult. For example, state A might group a number of permit regulations under one chapter of its administrative code while state B assigns each permit regulation a separate chapter. Therefore, even though state A might have more regulations, it will appear to have fewer regulations compared to state B because of the organizational structure.

The differences in the ratio of stand-alone regulations between Virginia and North Carolina shown in Figure 15 illustrate this point. North Carolina's State Administrative Procedure Act encourages agencies to segment regulations into shorter, more discrete rules. Virginia does not have a comparable policy and consequently cites its regulations using a different structure. Therefore, North Carolina appears to have many more environmental regulations than Virginia. However, agency staff in North Carolina note that this higher number of regulations does not necessarily indicate that the State is more aggressive in adopting environmental regulations than other states.

Figure 15: Virginia's Manufacturing, Pollution, Resources and Environmental Regulations Compared to Other States

	High-Emissions Manufacturers				Facilities Releasing Toxic Pollutants ('01)		State Natural Resources			Characteristics of State Environmental Regulatory Framework		
	Chemical		Paper		10 Largest Facilities (mil pounds)	% Releases from Manufacturers	Square Miles Land	Square Miles Water	Miles Coast-line	Reported Regulatory Initiatives	"Stand-Alone"[1] as Portion of Total[2]	Large Impact "Stand Alone"
	#	%	#	%								
Virginia	187	3.2	108	1.8	25.1	73	39,594	1,066	112	•Executive Orders require compelling rationale to promulgate regulations •2005 improvement analysis to streamline DEQ permit process	10/19	0/10
Maryland	196	4.9	44	1.1	36.3	58	9,744	680	31	•Regulatory Review and Evaluation Act requires on-going review to ensure regulations are necessary and justified	14/62	0/14
Pennsylvania	617	3.7	295	1.8	62.1	22	44,817	490	0	•Executive Order requires that regulations be no more stringent than federal standards unless justified by compelling State interest	4/15	0/4
North Carolina	416	3.9	204	1.9	84.9	12	48,711	3,960	301	•Administrative Procedure Act encourages that regulations be divided into short rules to enhance usability	19/116	1/17
Tennessee	278	4.0	157	2.3	83.7	62	41,217	926	0	•No reported restrictions on regulatory development or recent reviews of environmental regulations	4/18	4/4
Georgia	472	5.4	188	2.1	68.6	16	57,927	4,672	100	•No reported restrictions on regulatory development or recent reviews of environmental regulations	17/48	10/17

[1] Stand-alone regulations are enacted by state authority alone and have no supporting federal statute, as opposed to supplemental regulations which are based on federal mandate.
[2] "Total" indicates total state-initiated regulations.

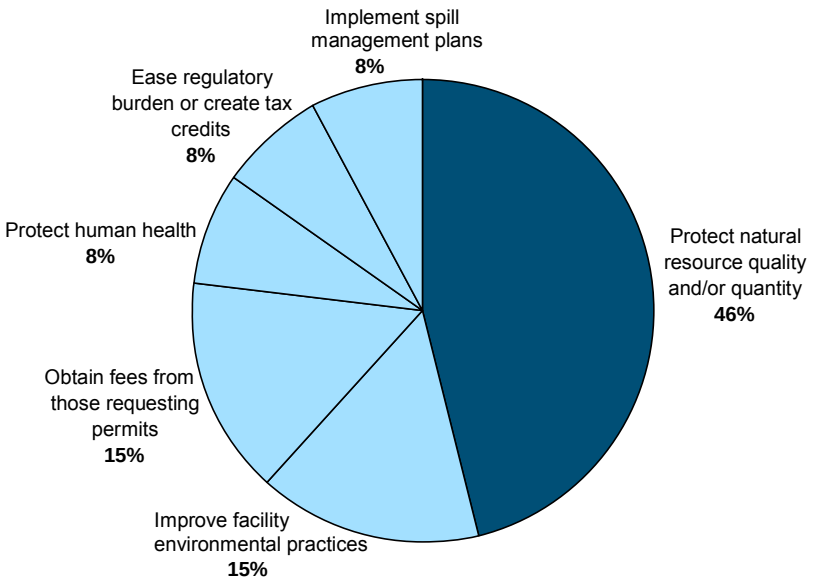
Source: JLARC staff analysis of Environmental Protection Agency data and state environmental agency responses to JLARC staff regulatory worksheet.

Figure 16: Virginia's Stand-Alone Regulations Considered Having "Some" or "Large" Impact Compared to Other States

	Virginia	Georgia	Maryland	North Carolina	Pennsylvania	Tennessee
Air	•None	•Particulate Emissions from Cotton Gins •NOx Emissions from Fuel-Burning Equipment •NOx Emissions from Small Fuel-Burning Equipment •VOC Emissions from Expanded Polystyrene Products Manufacturing •VOC Emissions from Extruded Polystyrene Products Manufacturing Utilizing a Blowing Agent •Particulate Emissions from Kaolin and Fuller's Earth Processes •VOC Emissions from Aerospace Manufacturing and Rework Facilities •Additional Provisions for Areas Contributing to the Ambient Air Level of Ozone in the Metropolitan Atlanta Ozone Non-Attainment Area. •Listing of counties which contribute to the ambient air level of ozone in the metropolitan Atlanta area	•Toxic Air Pollutants •Procedures Related to Requirements for Toxic Air Pollutants •Miscellaneous Metal •Structural Steel •Yeast •Leather Coating •Fiberglass •Control of Glass Melting Furnaces	•Total Suspended Particulates •Emissions from Spodumene Ore Roasting •Control of Mercury Emissions •Control of Ethylene Oxide Emissions •Odor Control of Feed Ingredient Manufacturing Plants •Control of Emissions from Abrasive Blasting •Transportation Facilities •Control of Toxic Air Pollutants •Hazardous Waste Incinerators •Sewage Sludge and Sludge Incinerators •Commercial/Industrial Solid Waste Incinerators •Control of Odors •Banking Emission Reduction Credits •Notification in Areas Without Zoning •Transportation Facility Procedures •Toxic Air Pollutant Procedures	•None	•Ambient Air Quality Standards: Total Suspended Particulate •Ambient Air Quality Standards: Hydrogen Chlorides •Ambient Air Quality Standards: Gaseous Fluorides •General Provisions
Water	•Ground Water Standards •Eastern Virginia Ground Water Management Area •Ground Water Withdrawal Regulations •Order Declaring the Eastern Shore of Virginia - Accomack and Northampton Counties as a Critical Ground Water Area	•Preparation and Submission of Engineering Reports, Plans Specifications, and Environmental Information Documents •Emergency Actions •Land Disposal and Permit Requirements •General Permit - Land Application System Requirements	•None	•None	•None	•None
Waste	•Solid Waste Management Permit Action Fees	•Georgia Rules for Solid Waste Management	•Standards Applicable to Transporters of Hazardous Waste – General	•None	•Source Reduction Strategy •Duties of Generators	•Special Waste Approval Process

Source: JLARC staff analysis of state environmental agency responses to JLARC staff regulatory worksheet.

Figure 17: Virginia's Stand-Alone Regulations Primarily Protect Natural Resources



Source: JLARC staff analysis of DEQ response to JLARC staff regulatory worksheet.

ENVIRONMENTAL ISSUES FOR FURTHER ANALYSIS AND CONSIDERATION

During the course of this review, manufacturers identified several Virginia environmental regulations that, in their opinion, could be improved. These regulations, a characterization of the companies' suggestions, and the DEQ response are included in Appendix D. The information in this appendix may be a useful starting point for the Manufacturing Development Commission or other initiatives seeking to assess how to improve the State's environmental regulatory framework. Manufacturers also had additional concerns that focused less on specific regulations and more on the State's regulatory approach.

Manufacturers Are Concerned About the Timeliness of DEQ Permit Processing

Manufacturers participating in the case studies and those responding to the survey expressed concern about the length of time to obtain environmental permits. The number of days required for DEQ to process permits varies due to the diverse and complex nature of permit requirements. A 1997 review of DEQ by JLARC staff also addressed this issue, stating that many factors, such as negotiation of permit conditions with permittees and public comment periods, contribute to the length of time required to process a permit,

making it difficult to reduce that time. The number of permit applications has increased in recent years, with no appreciable increase in DEQ permit staffing. DEQ indicates that since 1993 the average length of time to process a water permit increased 51 days for individual permits. Although many of the requirements for Virginia's permit processes are set at the federal level, there are areas within Virginia's control that can be improved.

A 2005 peer review of DEQ's permit process identified about 250 improvement opportunities, some of which would address concerns expressed by manufacturers during the JLARC staff case studies and survey:

- Provide technical training to both the regulated community and DEQ staff to facilitate a more common understanding of regulations and permit requirements.
- Initiate a focus group/working team to review/discuss improvements to forms and guidelines.
- Allow carryover of unchanged information from previous permits into new permit applications or renewals.
- Reduce general permit issuance and maintenance time by 66 percent by streamlining the process and better identifying facilities eligible for general permits.

The impact of waiting for permit approval can be especially significant for smaller companies. Several smaller manufacturers responding to the JLARC staff survey noted that permit approval waiting times can make the difference between gaining or losing a competitive advantage for their business.

Additional Opportunities Exist to Reduce Pollution

The Governor's Environmental Excellence Awards is a Virginia program that recognizes manufacturing facilities that have demonstrated pollution-reducing technologies or management practices. Facilities that submit applications to receive this award must show the type and amount of pollution being reduced through their innovations. Over the last four years, 55 facilities have submitted applications to this program. Winners are responsible for promoting the replication of these techniques by speaking at conferences and working with other companies who are interested in a similar approach. Although this initiative is commendable, the total number of participating facilities over the past four years represents only one percent of Virginia's total manufacturing facilities and employs less than ten percent of Virginia's manufacturing employees.

Until 2002, DEQ had an office that was specifically focused on promoting the replication of advanced technology to reduce pollution. However, the office was eliminated for budgetary reasons and there is now no single point of contact within DEQ that is primarily responsible for identifying and promoting opportunities for companies to reduce pollution. Although environmental consultants and other membership organizations help communicate this information to manufacturers, they reach a relatively small number of manufacturers. A more concentrated effort to promote and replicate the use of these innovative technologies would benefit both Virginia's environment and manufacturers.

Finally, the following example illustrates the importance of facilitating companies' efforts to reduce pollution. One manufacturing company wanted to use landfill gas as an alternative fuel, which would have resulted in lower emissions. However, the company needed a new permit to use the new fuel. The company ultimately abandoned the idea because it believed the burden of the DEQ permit process was going to outweigh the savings it could reap through the new approach. The company lamented that, in this instance, Virginia's regulatory approach was a barrier to their achieving the "win-win" situation of reducing their emissions and possibly lowering their environmental compliance costs.

Chapter 3

Costs and Comparisons for Economic Regulations

In Summary

The estimated direct costs for Virginia manufacturers to comply with federal economic regulations range from $96 million to $186 million. The estimates of direct expenditures were developed from the "bottom-up" by aggregating sub-sector or industry-specific costs. These costs range from $100 to $3,392 per employee, depending on the sub-sector or industry. In addition, if other types of costs are added, such as losses in societal welfare and transfers, the costs may be as high as $1.1 billion. The other costs, however, likely have a lower degree of certainty than the direct cost estimates. State economic regulations that apply to manufacturers focus primarily on food manufacturers, closely mirror federal regulations, and are generally similar to other states. Consequently, these State regulations do not appear to add substantial costs beyond the federal economic regulations for Virginia manufacturers.

Economic regulations restrict a company's primary economic activities. These regulations include a wide range of constraints and incentives concerning market access, the use of inputs and production techniques, output choices, pricing decisions, and international trade. The regulations are designed to regulate international trade by eliminating trade barriers and safeguarding American industries and jobs against unfair trade; protect consumers from unsafe products, foods, and drugs; ensure stable prices for certain agricultural products, such as milk; and prohibit unfair competition. The regulations consist of both federal and Virginia mandates.

COSTS TO VIRGINIA MANUFACTURERS OF COMPLYING WITH FEDERAL ECONOMIC REGULATIONS

To determine the cost to Virginia manufacturers of complying with federal economic regulations, JLARC staff analyzed existing estimates, conducted case studies with Virginia manufacturing companies, and analyzed data from a survey of Virginia manufacturers. Economic regulations include both international trade and consumer protection regulations (Table 11). These regulations are promulgated and administered by a number of federal agencies, including the Departments of Commerce and Agriculture, International Trade Administration, Consumer Products Safety Commis-

Table 11: There Are Two Major Types of Economic Regulations

Type of Regulation	Definition	Examples
International Trade	Regulate international trade through export regulations, which are designed to both control and promote exports, and import regulations, which protect U.S. industries from unfair trade. Affect all manufacturers who engage in international trade.	Import regulations for imported food, drugs, biologics, cosmetics, medical devices; export regulations for cosmetics and for meat, poultry, and egg products; Export Administration Regulations (which regulate the export and re-export of items for national security, nonproliferation, foreign policy, and short supply reasons); antidumping regulations.
Consumer Protection	Can affect production and output decisions by mandating certain safety requirements with which manufacturers must comply. Can also impact a manufacturer's pricing decisions. Consumer protection regulations tend to be very sub-sector/industry specific.	Regulations that require baby furniture, such as cribs, to meet certain safety standards; regulations dealing with food and drug safety and labeling; regulations that prohibit unfair or deceptive acts (such as truth in advertising) in particular industries; price supports for certain dairy products.

Source: JLARC staff analysis of federal agency documents and academic literature.

sion, Food and Drug Administration, and Federal Trade Commission. This collective framework of regulations was the basis of the JLARC staff analysis of compliance costs.

JLARC Staff Estimated the Costs of Complying With Federal Economic Regulations

Estimating the costs to manufacturers of complying with federal economic regulations is challenging because some of the existing estimates only include direct expenditures while others incorporate additional types of costs. Variations in the types of costs included in each estimate can result in widely different estimates of the cost of compliance. Making the distinction between direct expenditures and other costs is an important step in developing a cost estimate of economic regulatory compliance because of the fundamental difference between these two types of costs. Table 12 provides specific examples of these two types of costs. In general, direct expenditures include the capital expenditures and operating costs incurred by companies required to comply with certain regulations. Other costs are those that may result from regulatory compliance but are not necessarily expenditures made by manufacturing companies, such as trade restrictions.

Table 12: Examples of Direct Expenditures and Other Costs

Direct Expenditures	Other Costs
• Product reformulation or redesign • Development of new standard operating procedures • Staff training • Recordkeeping • Product testing expenditures	• Losses in societal welfare due to unrealized production potential • Transfers (financial payments) to other sectors and/or within the manufacturing sector

Source: JLARC staff analysis of various cost estimates.

To determine the cost to Virginia manufacturers of complying with federal economic regulations, JLARC staff completed three steps:

Step 1: Review, Analyze, and Categorize Existing Cost Estimates. JLARC staff reviewed and analyzed existing agency, academic, and other cost estimates and determined whether they included direct costs or other types of costs. Cost estimates included in the *OMB Report to Congress on the Costs and Benefits of Federal Regulations* for years 1997 to 2005 and federal agency cost estimates in the Federal Register included direct cost estimates for selected consumer protection regulations. The Small Business Administration's *Impact of Regulatory Costs on Small Firms* included a cost estimate for economic regulations that included both direct expenditures and other types of costs for international trade and consumer protection regulations.

Step 2: Group Estimates of Direct Expenditures by Manufacturing Sub-Sector and/or Industry. Federal consumer protection regulations are typically focused on specific sub-sectors of the economy and often on specific industries within a sub-sector. For this reason, the costs of specific regulations cannot be uniformly applied to the manufacturing sector as a whole, which makes it difficult to develop a single cost estimate for the manufacturing sector. It would be misleading to apply the costs of food regulations, for example, to Virginia's manufacturing sector as a whole because these regulations affect a relatively small percentage of the entire sector. Consequently, JLARC staff aligned existing estimates of direct expenditures with the most affected manufacturing sub-sector or industry.

Step 3: Inflate the Estimates to 2005 Dollars and Apportion Estimates to Virginia Manufacturers. JLARC staff inflated both the direct expenditure and other cost estimates to 2005 dollars using the Consumer Price Index. The direct expenditure estimates were apportioned to Virginia manufacturers by determining the percent-

age of the nation's manufacturing employment for the relevant sub-sector or industry in Virginia.

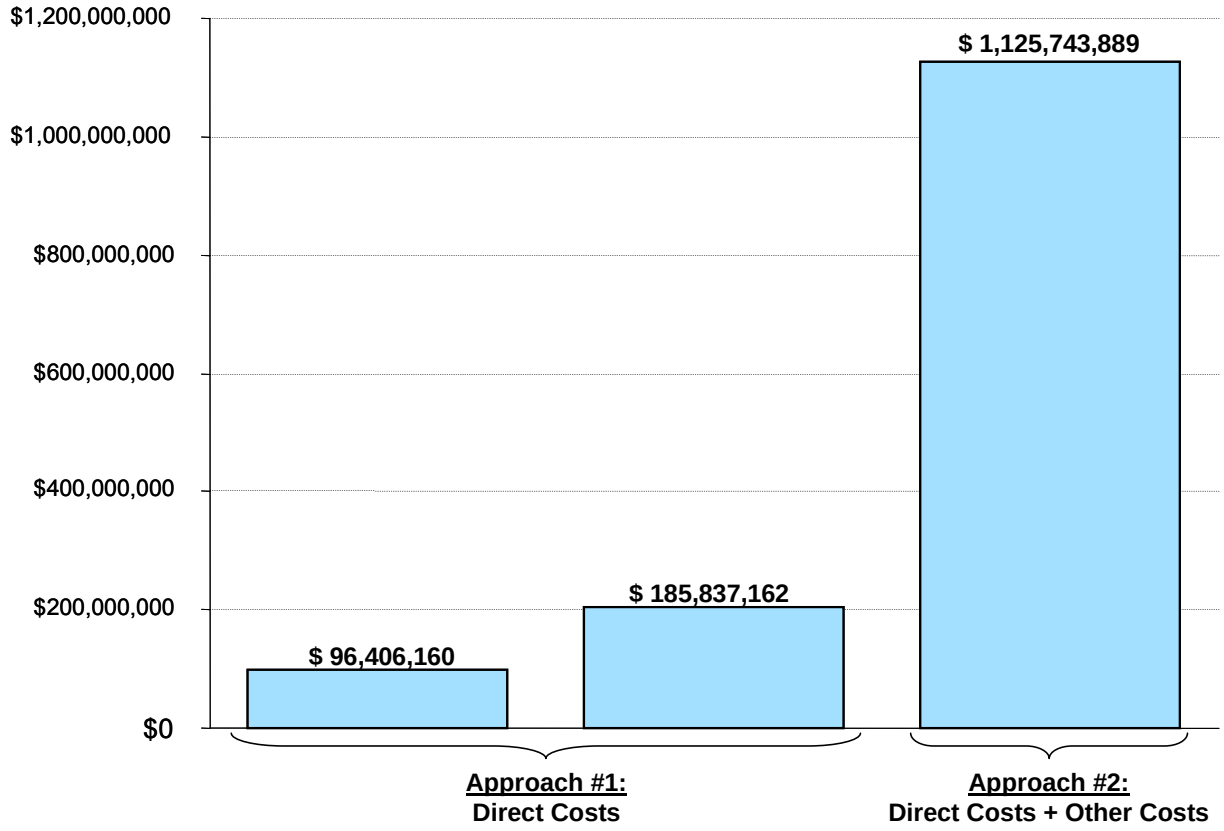
These costs were applied in a targeted, precise manner only to the impacted sub-sector or industry and not to other manufacturing sub-sectors or industries. For example, estimates of the costs to comply with the advanced airbags regulation were only applied to Virginia's transportation equipment manufacturing sub-sector. This resulted in different cost estimates for each sub-sector/industry for which estimates were available, which were then combined to create an aggregate cost estimate of direct expenditures for the manufacturing sector as a whole. Finally, JLARC staff apportioned the Small Business Administration (SBA) estimate of direct expenditures plus other costs using Virginia's percentage of the nation's total manufacturing employees.

Estimated Direct Costs Range from $96 Million to $186 Million While Other Costs May Bring the Total to as High as $1.1 Billion

Figure 18 presents JLARC staff-adjusted estimates of the direct expenditures and other costs that manufacturers may have incurred when complying with economic regulations in 2005. Approach #1 includes only direct costs, which range from $96 million to $186 million. There are two estimates for direct costs because ranges of costs were presented in the original cost estimates. Approach #2 includes direct costs plus other costs, bringing the total to $1.1 billion. The wide variation in estimates using the two approaches is due to the types of costs included in the estimates.

Approach #1 Includes Direct Costs that Range from $96 Million to $186 Million. The direct cost estimates only include costs for consumer protection regulations because direct cost estimates for international trade regulations were not available. As described above, the direct cost estimate for consumer protection regulations was developed from the bottom up, by aggregating industry-specific direct cost estimates. JLARC staff were able to identify economic cost estimates for several manufacturing industries, including food and beverage, tobacco products, medical equipment and supplies, pharmaceuticals, and cars and light trucks. These industries represent approximately one-third of total manufacturing employment in Virginia. For the other manufacturing industries in Virginia, there were either no consumer protection regulations that affected the sub-sector/industry or no available direct cost estimates.

Figure 18: Annual Costs to Virginia Manufacturers of Complying With Federal Economic Regulations, 2005



Source: JLARC staff analysis of OMB reports, Federal Register notices, and Small Business Administration data.

Table 13 shows the total direct cost estimates and the per-employee cost estimates for each of the industries for which JLARC staff were able to identify direct compliance costs. Virginia-specific manufacturing estimates for each sub-sector/industry ranged from a low of $67,490 to a high of $118 million. On a per-employee basis, costs ranged from $100 to $3,392. On an average per-firm basis, the costs ranged from $3,793 for medical equipment and supplies manufacturers to $847,157 for manufacturers involved in animal slaughtering and processing. The types of direct costs included in each of the industry-specific estimates varied because of the different industries involved. For example, the direct expenditure estimate for the pharmaceutical industry includes costs such as product reformulation, added paperwork requirements, and studies of drug effects on pediatric patients. The costs of food regulations include developing standard operating procedures, recordkeeping, training, and labeling.

Table 13: Estimates of Total Direct Costs and Per-Employee Costs for Consumer Protection Regulations Vary Widely by Industry

Sub-Sector/Industry	Total Direct Cost (Low Estimate)	Total Direct Cost (High Estimate)	Per-Employee Cost (Low)	Per-Employee Cost (High)
Food and Beverage Manufacturing				
Animal Slaughtering and Processing	$44,601,679	$55,065,182	$2,747	$3,392
Food Manufacturing	3,184,149	6,239,154	100	195
Other Animal Food Manufacturing	1,137,907	1,137,907	1,759	1,759
Fruit and Vegetable Canning	200,898	200,898	305	305
Tobacco Product Manufacturing	1,079,273	1,079,273	243	243
Medical Equipment and Supplies Manufacturing	1,069,680	1,069,680	336	336
Pharmaceutical and Medicine Manufacturing	1,102,573	2,308,548	303	635
All Other Converted Paper Prod. Manufacturing	67,490	67,490	218	218
Transportation Equipment Manufacturing	43,975,317	118,669,029	1,076	2,904
TOTAL	**$96,418,965**	**$185,837,162**		

Note: These cost estimates are for final rules issued between 1996 and 2005.

Source: JLARC staff analysis of OMB reports to Congress and Federal Register notices.

Approach #2 Includes Direct Costs Plus Other Costs and Totals $1.1 Billion. The JLARC staff-adjusted estimate of direct costs plus other costs includes both international trade and consumer protection regulations. The majority of this estimate is for consumer protection regulations. Most of the consumer protection regulation cost estimate is from the SBA report, which bases its estimate on a model that predicts what the U.S. gross domestic product would be if the United States eliminated its domestic economic regulation. The remainder of the costs in this estimate are for international trade regulations. These costs are the direct efficiency losses associated with international trade restrictions and the additional burden associated with the transfer costs of trade restrictions. These costs apply to sub-sectors/industries involved in international trade.

In general, there is likely a lower degree of certainty with approach #2 that uses top-down modeling to estimate the costs of economic regulations because many of the regulations are sub-sector/industry specific. A bottom-up approach like the one used to estimate direct costs, which identifies the costs of individual regulations for specific industries, likely results in an estimate that has a higher degree of certainty.

VIRGINIA'S ECONOMIC REGULATIONS APPEAR TO HAVE MINIMAL COST

While most economic regulations affecting the manufacturing sector are federal, there are also regulations at the State level. The

State regulations tend to focus on consumer protection and safety, particularly for the food and beverage sub-sectors. Virginia has approximately 20 regulations for the food and beverage manufacturing sub-sectors (some of which are identical to federal regulations) and seven economic regulations that apply to other sub-sectors (Table 14).

Table 14: Most of Virginia's State Economic Regulations Apply to Food Manufacturers

Type	Title
Food	Rules and Regulations Pertaining to Meat and Poultry Inspection Under the Virginia Meat and Poultry Products Inspection Act
	Regulations Pertaining to Food for Human Consumption
	Regulations for the Control and Supervision of Virginia's Milk Industry
	Regulations Governing Grade "A" Milk
	Regulations Governing the Cooling, Storing, Sampling, and Transporting of Milk
	Rules and Regulations Governing Testing of Milk for Milkfat, Protein, and Lactose Content By Automated Instrument Methods
	Regulations Governing Milk for Manufacturing Purposes
	Rules and Regulations Governing the Production, Processing, and Sale of Ice Cream, Frozen Desserts, and Similar Products
	Rules and Regulations Pertaining to Labeling and Sale of Infant Formula
	Regulations for the Sanitary Control of Storing, Processing, Packing or Repacking of Oysters, Clams and Other Shellfish
	Regulations for the Sanitary Control of the Picking, Packing and Marketing of Crab Meat for Human Consumption
	Regulations for the Repacking of Crabmeat
	Rules and Regulations for the Enforcement of the Virginia Commercial Feed Law
	Rules and Regulations for the Enforcement of Virginia's Weights and Measures Law
Beverage	Rules and Regulations Pertaining to Carbonated and Still Water Bottling Plants and Beverages
	Advertising (alcoholic beverages)
	Tied-House (interaction between alcoholic beverage manufacturers, wholesalers, and retailers)
	Requirements for Product Approval (alcoholic beverages)
	Manufacturers and Wholesalers Operations (alcoholic beverages)
	Other Provisions (permits and recordkeeping requirements for alcoholic beverage industry)
Chemical	Rules and Regulations for Enforcement of the Virginia Animal Remedies Law
	Rules and Regulations for Enforcement of the Virginia Pesticide Law
	Rules and Regulations for the Enforcement of the Virginia Fertilizer Law
Other	Regulations for Bedding and Upholstered Furniture Inspection Program
	Virginia Industrialized Building Safety Regulations
	Virginia Manufactured Home Safety Regulations
	Manufactured Housing Licensing and Transaction Recovery Fund Regulations

Source: Virginia Regulatory Town Hall.

Virginia's Economic Regulations Do Not Appear to Add Substantial Costs

Virginia's additional economic regulations do not appear to add substantial costs beyond the federal economic regulations. In cases where the regulations appeared to have the potential to add costs beyond federal regulations, no cost estimates exist. Neither DPB nor the agencies responsible for these regulations quantify the total costs to manufacturers of complying with these regulations (DPB's mandate is to estimate the costs of proposed changes only, but not the total cost of an existing regulation).

Food Regulations Illustrate the Minimal Impact of State Economic Regulations. As stated earlier, food regulations make up the majority of Virginia's economic regulations, and most of these regulations either supplement or are identical to federal food regulations:

- Two of the major regulations affecting Virginia's food manufacturers are identical to federal regulations. The Virginia Department of Agriculture and Consumer Services (VDACS) has adopted the USDA's federal meat and poultry regulations by reference, and as such, Virginia's regulations are the same as federal regulations. In addition, Virginia's Regulations Pertaining to Food for Human Consumption is adopted verbatim from Title 21 of the Code of Federal Regulations. Because these regulations are adopted verbatim from the federal regulations, they add no additional costs for manufacturers.
- The majority of Virginia's other food regulations clarify, complement, or enhance federal regulations. According to the State agencies that administer these regulations, most of the supplemental regulations have minimal impact on Virginia manufacturers.

Case Study Companies Did Not Provide Cost Estimates for State Economic Regulations. Case study companies did not provide cost estimates for complying with State economic regulations, and none indicated that these regulations added substantial costs. This is primarily because no Virginia economic regulations applied specifically to any of the four case study companies' sub-sectors.

When asked about economic regulations, some companies discussed transportation and energy regulations. Although these regulations do not fall within the definition of economic regulations used for this review, JLARC staff accepted cost estimates for these regulations if the companies had them available. Only one company was able to provide a cost estimate for a state transportation regulation. The company stated that Virginia's statutory requirement regarding over-length trucks costs them $876,120 an-

nually in out-of-route costs, or about $2,420 on a per-employee basis.

Virginia's Economic Regulations for Food Manufacturers Are Similar to Other States

Because most of Virginia's economic regulations apply to the food manufacturing sub-sector, the focus of this state comparison is on regulations affecting food manufacturers. Virginia has approximately 32,000 people working in the food manufacturing subsector, which represents about 11 percent of the State's manufacturing employment. Pennsylvania and Georgia have the highest numbers of food manufacturing employees, representing 10 percent and 15 percent of these states' manufacturing employment, respectively. Maryland has the lowest number of food manufacturing employees; these employees represent 12 percent of the state's manufacturing employment.

Two limitations make cross-state comparison of state food regulations difficult:

- As discussed in Chapter 2, differences in the way states group and organize their regulations make a cross-state "unit of analysis" difficult.
- Food regulations can be administered by several different agencies and staff in each state, so it can be difficult to obtain a comprehensive list of each state's food regulations that affect manufacturers.

In general, the regulatory requirements and the types of industries regulated are similar among the states, with some minor exceptions. Most of the states reported having regulations for milk (which are often modeled after federal regulations) although the number of specific regulations varied. VDACS staff indicated that several of the State's milk regulations are consistent with those of other states and are necessary for Grade A dairy producers to ship their milk in interstate commerce. In addition, Virginia, Pennsylvania, Maryland, and Tennessee all have regulations for frozen ice cream and desserts. Virginia, Pennsylvania, Maryland also have regulations for the processing and handling of shellfish, and Virginia and Maryland have additional regulations for crab meat.

Other states had a few food regulations unique to their state. For example, Pennsylvania has a food employee certification regulation that requires food manufacturers to have at least one specially trained employee on staff if the manufactured food is potentially hazardous. This includes food which consists in whole or in part of

milk or milk products, eggs, meats, poultry, fish, shellfish, or edible crustaceans.

On the whole, it appears that neither Virginia nor any of the comparison states have a substantial number of food regulations. Virginia has ten food regulations that are not identical to federal regulations. State agency staff indicated that most of these regulations have minimal impact on manufacturers, with the exception of two seafood-related regulations that have "some" impact on manufacturers. In comparison, Maryland has eight regulations that are not identical to federal regulations, two of which they reported have "some" impact on manufacturers, and six of which have minimal impact. Similarly, Pennsylvania reported having four regulations that are not identical to federal regulations, one of which has some impact on manufacturers and three of which have minimal impact. In contrast, Tennessee reported that its food regulations mirror federal regulations, with one exception: Tennessee requires "factories, warehouses, or establishments in which foods are manufactured, processed, packed or held for introduction into commerce" to be licensed by the state. The state charges an annual license fee ranging from $50 to $350 based on the size of the facility.

Chapter 4

Costs and Comparisons for Workplace Regulations

In Summary

The estimated direct costs for Virginia manufacturers to comply with federal workplace regulations in 2005 ranged from $107 million to $163 million. The estimates of direct costs include estimates of expenditures made by companies to comply with regulations. In addition, if other types of costs are added, such as lost productivity, the costs may range from $379 million to $440 million. The other costs, however, likely have a lower degree of certainty than the direct cost estimates. Virginia manufacturing companies provided information about their compliance costs, which were similar to existing estimates for all types of workplace regulations except occupational safety and health regulations, which varied widely. Virginia's workplace regulations are largely driven by federal regulations and do not add substantial compliance costs beyond the federal regulations. Virginia's workplace regulations are also similar to other selected states' workplace regulations. Companies identified a refinement to a Virginia workplace statute that may merit further analysis and consideration.

Workplace Statutes

Several federal workplace statutes are referenced throughout this chapter:

- Consolidated Omnibus Budget Reconciliation Act (COBRA)
- Family and Medical Leave Act (FMLA)
- Employee Retirement Income Security Act (ERISA)
- Occupational Safety and Health Act (OSHA)
- Americans with Disabilities Act (ADA)
- Worker Adjustment and Retraining Notification Act (WARN)

Workplace regulations govern the relationships between employers and employees. The purpose of these regulations is to protect employees' interests and rights in terms of wages, benefits, safety and health, and civil rights, among other things. The workplace regulations that apply to manufacturers include minimum standards for employee pension benefit plans; requirements to purchase personal protective equipment for employees; and recordkeeping and reporting requirements under the Civil Rights Act.

COSTS TO VIRGINIA MANUFACTURERS OF COMPLYING WITH WORKPLACE REGULATIONS

To determine the cost to Virginia manufacturers of complying with federal workplace regulations, JLARC staff analyzed existing estimates, conducted case studies with Virginia manufacturing companies, and analyzed data from a survey of Virginia manufacturers. In contrast to the other functional areas of regulation, most of the existing estimates for workplace regulation focus on federal workplace statutes, not regulations. Therefore, the final cost estimates for workplace regulations are actually estimates of the costs of workplace statutes, with the exception of the estimates for occupational safety and health regulations.

Nineteen federal statutes form the basis of the federal workplace regulatory framework that applies to manufacturers (Table 15).

Table 15: Nineteen Federal Workplace Statutes Can Be Grouped into Six Categories

Type of Workplace Statute/ Regulation	Description	Federal Statutes
Labor Standards	Encompass traditional legal requirements for minimum pay, overtime pay, and pay standards for government contracts	• Fair Labor Standards Act • Walsh-Healey Act • Contract Work Hours and Safety Standards Act
Employee Benefits	Govern health and pension benefits packages	• Consolidated Omnibus Budget Reconciliation Act • Family and Medical Leave Act • Employee Retirement Income Security Act
Occupational Safety and Health	Deal with safety and health regulations for the workplace	• Occupational Safety and Health Act • Drug-Free Workplace Act
Civil Rights	Govern the relationship of employers and disabled and minority workers	• Equal Pay Act • Title VII of the Civil Rights Act of 1964 • Age Discrimination in Employment Act • Americans with Disabilities Act • Executive Order 11246 • Rehabilitation Act of 1973
Labor-Management Relations	Concern the interaction of employers and unions	• National Labor Relations Act • Labor-Management Reporting and Disclosure Act
Employment Decision Laws	"Catch-all" category for rules dealing with hiring and firing practices	• Polygraph Protection Act • Immigration Reform and Control Act • Worker Adjustment and Retraining Notification Act

Source: "Workplace Regulations: Information on Selected Employer and Union Experiences," GAO, June 1994.

In addition, there are 16 Virginia workplace regulations that apply to the manufacturing sector. These statutes and regulations were the basis of the JLARC staff analysis of compliance costs.

JLARC Staff Identified and Adjusted Existing Estimates of Workplace Compliance Costs

Estimating the costs to manufacturers of complying with workplace regulations is challenging because many of the existing cost estimates include only direct expenditures while others incorporate other costs. Variations in the types of costs included in each estimate can result in widely different compliance cost estimates. There are fundamental differences between direct expenditures and other costs (Table 16). In general, direct expenditures include the capital expenditures and operating costs incurred by companies required to comply with workplace regulations. These expenditures are typically for staff salaries, equipment, infrastructure,

Table 16: Examples of Direct Expenditures and Other Costs to Manufacturers of Complying with Workplace Regulations

Direct Expenditures			Other Costs	
Staff Time	**Capital Expenditures**	**Other**	**Opportunity Costs**	**Special Costs**
• Reporting and disclosure costs for ERISA • Administering COBRA for former employees (notification, tracking recipients, and collecting and processing payments) • Reporting workplace injuries, illnesses, and fatalities to the federal government	• Modifying workspaces or facilities to improve safety and/or accessibility • Modifying work environments to make them handicapped accessible (including widening doorways, purchasing larger computer monitors for visually impaired)	• Purchasing personal protective equipment or air handling equipment to comply with OSHA • Providing continued health benefits while employees take family leave under FMLA	• Losses caused by the inability to hire illegal immigrants • Lost productivity from union strikes	• Settlement awards and legal costs for discrimination complaints under the Civil Rights Act • Talent drain associated with WARN (notified employees will leave the company earlier than they would have without notification)

Source: JLARC staff analysis of *A Review and Synthesis of the Cost of Workplace Regulations*, J. Johnson; OSHA regulatory analyses; and other documents.

and other types of payments. Other costs may result from a particular regulation but are not necessarily made directly by a manufacturer to comply with a regulation. These other costs can generally be categorized as opportunity costs, which are the costs of an opportunity forgone (and the benefits that could be received from that opportunity), and special costs, which typically only apply to certain manufacturers or in certain situations.

To determine the cost to Virginia manufacturers of complying with federal workplace regulations, JLARC staff executed a four-step process:

Step 1: Review, Analyze, and Categorize Existing Estimates. JLARC staff analyzed existing agency, academic, and other cost estimates. Where possible, staff used estimates from *A Review and Synthesis of the Cost of Workplace Regulations* (a working paper by regulatory economist Joseph M. Johnson for the Mercatus Center at George Mason University) because these were the most up-to-date estimates. This report compiled and updated previous workplace cost estimates. However, JLARC staff did not use Johnson's estimate in certain situations, including

- if the original source documentation had manufacturing-specific estimates (this typically applied to the OSHA regula-

tions). In these cases, JLARC staff used the manufacturing-specific estimate from the source documentation;

- if JLARC staff could obtain more insight into how the original estimate used by Johnson was derived (again, this typically applies to the OSHA regulations);
- if the basis for the Johnson estimate was unclear (in these cases, a GAO estimate was used); or
- if the estimate did not apply to the manufacturing sector. For example, the cost estimate for the Migrant and Seasonal Agricultural Worker Protection Act was not included because this act only applies to the agricultural sector.

Where possible, the existing estimates were then separated into those that captured direct expenditures and those that captured other types of costs.

Step 2: Inflate the Direct Cost Estimates into 2005 Dollars. JLARC staff inflated the cost estimates to 2005 dollars using the Compensation Index for manufacturing to inflate administrative costs, the Producer Price Index to inflate capital costs, the Insurance Index to inflate the costs of health benefits, and the Consumer Price Index to inflate all other costs. JLARC staff also inflated the cost estimates based on the year the estimate was originally developed, as opposed to inflating an already inflated estimate from a secondary source.

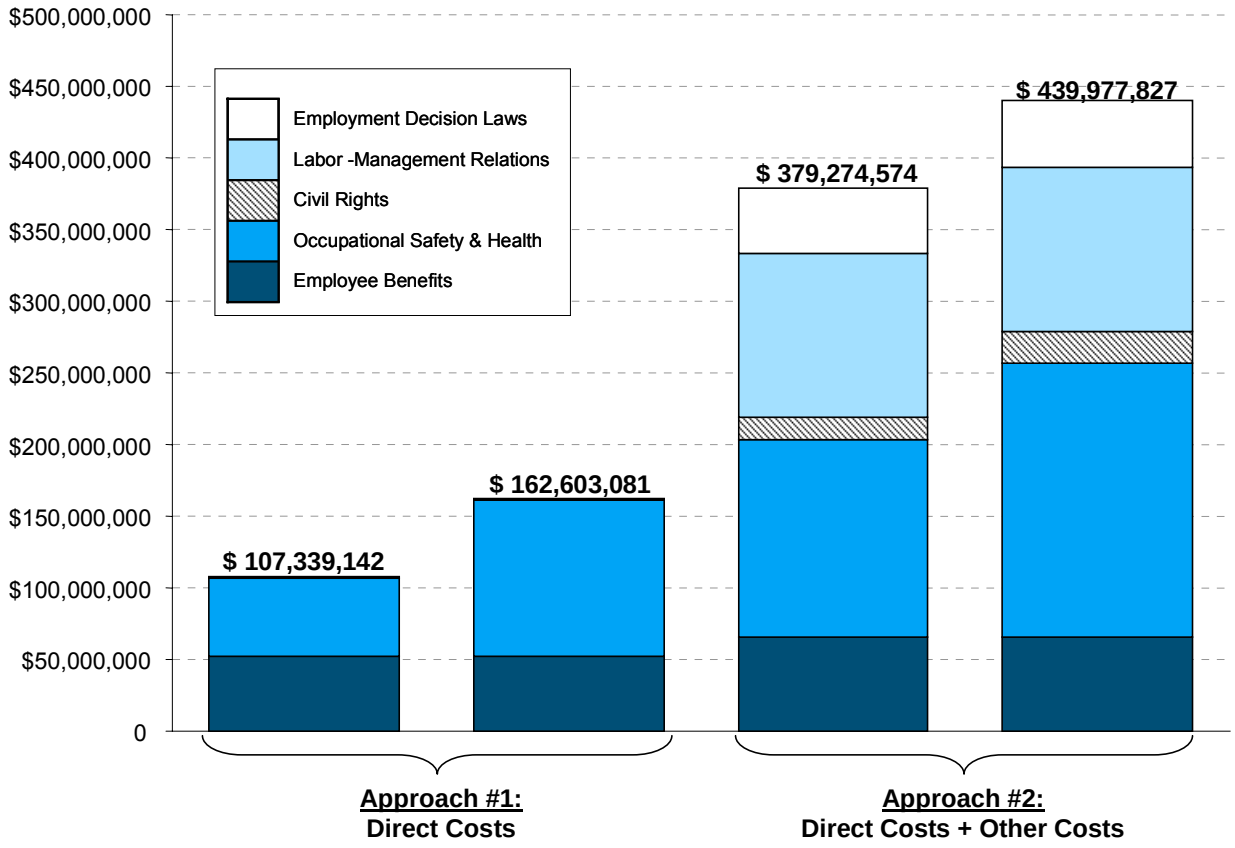
Step 3: Apportion the Estimate to a Manufacturing-Specific Estimate, if Necessary. For estimates that were not manufacturing-specific, JLARC staff apportioned the inflated estimates to a manufacturing-specific estimate using manufacturing's percentage of the nation's total employment.

Step 4: Apportion the Manufacturing-Specific Estimate to a Virginia-Specific Estimate. JLARC staff then apportioned all manufacturing-specific estimates to a Virginia-specific estimate using Virginia's portion of the nation's total manufacturing employment.

Estimated Direct Costs Range from $107 Million to $163 Million While Other Costs Bring the Total to Between $379 Million and $440 Million

Figure 19 presents JLARC staff-adjusted estimates of the direct expenditures and other costs that manufacturers may have incurred when complying with workplace regulations in 2005. Approach #1 includes only direct costs, which range from $107 million to $163 million. Approach #2 includes direct costs plus other costs, bringing the total to between $379 million and $440 million. While

Figure 19: Annual Costs to Virginia Manufacturers of Complying with Federal Workplace Statutes/Regulations, 2005



Source: JLARC staff analysis of *A Review and Synthesis of the Cost of Workplace Regulations*, J. Johnson; OSHA regulatory analyses; and other documents.

an exact point estimate of the costs is not available—and the implied precision of such an estimate would likely be misleading—the actual cost to companies could be somewhere between the lowest and highest amounts shown.

Approach #1 Includes Direct Costs that Range from $107 Million to $163 Million. The estimated total cost to Virginia manufacturers of complying with federal workplace statutes/regulations ranges from $107 million to $162.6 million. The estimates range from $363 to $550 per Virginia manufacturing employee and from $17,542 to $26,573 per Virginia manufacturing company. These costs represent about one percent of manufacturers' total payroll. The major costs included in this estimate are the costs of complying with occupational safety and health regulations and employee benefits regulations. In contrast, civil rights regulations comprise only about one percent of the direct expenditures estimate.

Approach #2 Includes Direct Costs Plus Other Costs and Totals Between $379 Million and $440 Million. Including other costs along with direct expenditures increases the workplace cost estimates substantially. These other costs range from $272 million to $277 million, and they increase the total cost estimate to between $379 million and $440 million. The main drivers of these direct expenditures plus other costs are occupational safety and health regulations and labor-management relations regulations. The direct expenditures plus other costs for occupational safety and health range from $138 million to $192 million and include costs such as fines for violations, in addition to the direct costs described above. The cost estimate for the labor-management relations regulations includes other costs only. These costs, which result from changes in company and/or employee behavior in unionized industries, are approximately $114 million.

The inclusion of these other costs in an estimate results in an estimate that has a lower degree of certainty than the direct cost estimates. For example, many of the other costs do not apply to all manufacturers, so extrapolating these costs to all manufacturers inaccurately increases the estimates for all manufacturers. In addition, JLARC staff questioned whether some of the other costs included in the estimates are true compliance costs. For example, the other costs associated with occupational safety and health regulations include the costs of fines for violations, which are actually the costs of not complying with the regulations.

Case Study Companies Generally Agreed With JLARC Staff-Adjusted Direct Cost Estimates

Because companies were more likely to have estimates for direct expenditures than other types of costs, JLARC staff provided case study companies with cost estimates of employee benefits, occupational safety and health, and civil rights statutes and regulations. JLARC staff adjusted these existing direct expenditure estimates on a per-employee basis to make them more relevant to each case study company.

The methodological limitations discussed previously made it difficult for companies to calculate their own estimates in certain areas. In particular, companies had difficulty determining the portion of their human resources and workplace costs that should be attributed to regulation and the costs that would exist without regulation. However, companies did have some insight into their compliance costs and were able to provide feedback on the existing estimates and their own estimates for occupational safety and health regulations.

Overall, the five case study companies believed the per-employee cost estimates provided by JLARC staff were reasonable for their companies. Moreover, even though the companies were in different manufacturing sub-sectors, it appeared that most regulations, other than occupational safety and health regulations, impacted the companies in the same way. In certain instances, a company had more specific estimates that would better apply to their company. In these situations, the companies could usually provide a rationale for why their costs would vary from the existing estimate.

Companies Generally Agreed With Employee Benefits Estimates. Employee benefits regulations cost Virginia manufacturers an estimated $52 million in direct expenditures in 2005 and $13 million in other costs. The majority of the direct expenditure estimate ($44.5 million) is the cost of administering COBRA, which requires employers to offer group health benefits provided by their group health plan for limited periods of time under certain circumstances such as voluntary or involuntary job loss. COBRA allows companies to charge 102 percent of a former employee's health insurance premiums to help recoup administrative costs, but the existing cost estimates did not account for this. Activities incurring costs include tracking former employees who are on COBRA and completing required paperwork. ERISA and FMLA costs are a smaller percentage of the direct cost estimate for employee benefits, costing Virginia's manufacturers approximately $4 million and $3.6 million, respectively. The $13 million in other costs is from lost productivity associated with FMLA.

Case study companies generally agreed that the estimates provided were representative of their costs; no companies provided different estimates. The computer and electronic equipment company did have one modification to these estimates; this company felt that the overall per-employee estimate for employee benefits was accurate, but that the major cost driver in this category was FMLA, not COBRA.

One Company Had a Different Estimate for One Civil Rights Statute. The only existing direct cost estimate for the civil rights statutes was for ADA compliance for people with disabilities. This statute cost Virginia manufacturers between an estimated $857,000 and $1.2 million in direct expenditures in 2005. Other costs for civil rights statutes ranged from $14.4 million to $20.8 million, and include the costs of settlement awards for discrimination complaints.

Two of the case study companies felt that the direct cost estimate for ADA ($3 to $4 on a per-employee basis) was reasonable, but paper company A felt that the estimate was too low. This company was able to provide specific capital costs because they had undergone some recent construction. They estimated their ADA costs for

2005 to be about $25 per employee, which is about $21 more per employee than the existing estimate. This highlights the methodological challenge of determining the timeframe in which to measure costs and benefits. Had JLARC staff measured this company's costs the year before or the year after, those capital expenditures would not have been included in the estimate.

None of the companies were able to provide cost estimates for the other types of civil rights statutes. The computer and electronics equipment company noted that they have significant costs in this area, but were unable to provide a dollar estimate. Some of these statutes were enacted more than 30 years ago, and compliance has become part of most companies' routine business processes.

Only One Company Provided Different Estimates for Labor-Management Relations and Labor Standards. There were no existing direct cost estimates for these two categories of regulations. However, there was an estimate of other costs for the Labor-Management Relations statutes, which was approximately $114 million. These costs include lost productivity from union strikes and changes in company and/or employee behavior in unionized industries.

Only one company provided company-specific estimates for these statutes. Paper company A estimated that complying with labor standards cost the company $200,000 in 2005; these costs are "supervisory maintenance" of their timekeeping system. This company also estimates that it spent $19,200 for monthly union/management meetings associated with the National Labor Relations Act.

Companies Did Not Provide Different Estimates for Employment Decision Laws. The existing estimates for employment decision laws were for other costs, not direct expenditures, and were about $46 million. These costs include penalties for not complying with WARN.

In general, case study companies could not provide estimates for employment decision laws. The companies were unable to provide a cost estimate for WARN because this statute only applies to companies who are about to experience large layoffs, which the case study companies had not experienced in 2005. The computer and electronics equipment company indicated that it spent a substantial amount on the Immigration Reform and Control Act because it sponsors immigration for foreign workers. This includes legal costs and the costs of applying for visas and green cards.

Companies Were Able to Provide More Company-Specific Cost Estimates for Occupational Safety and Health Regulations

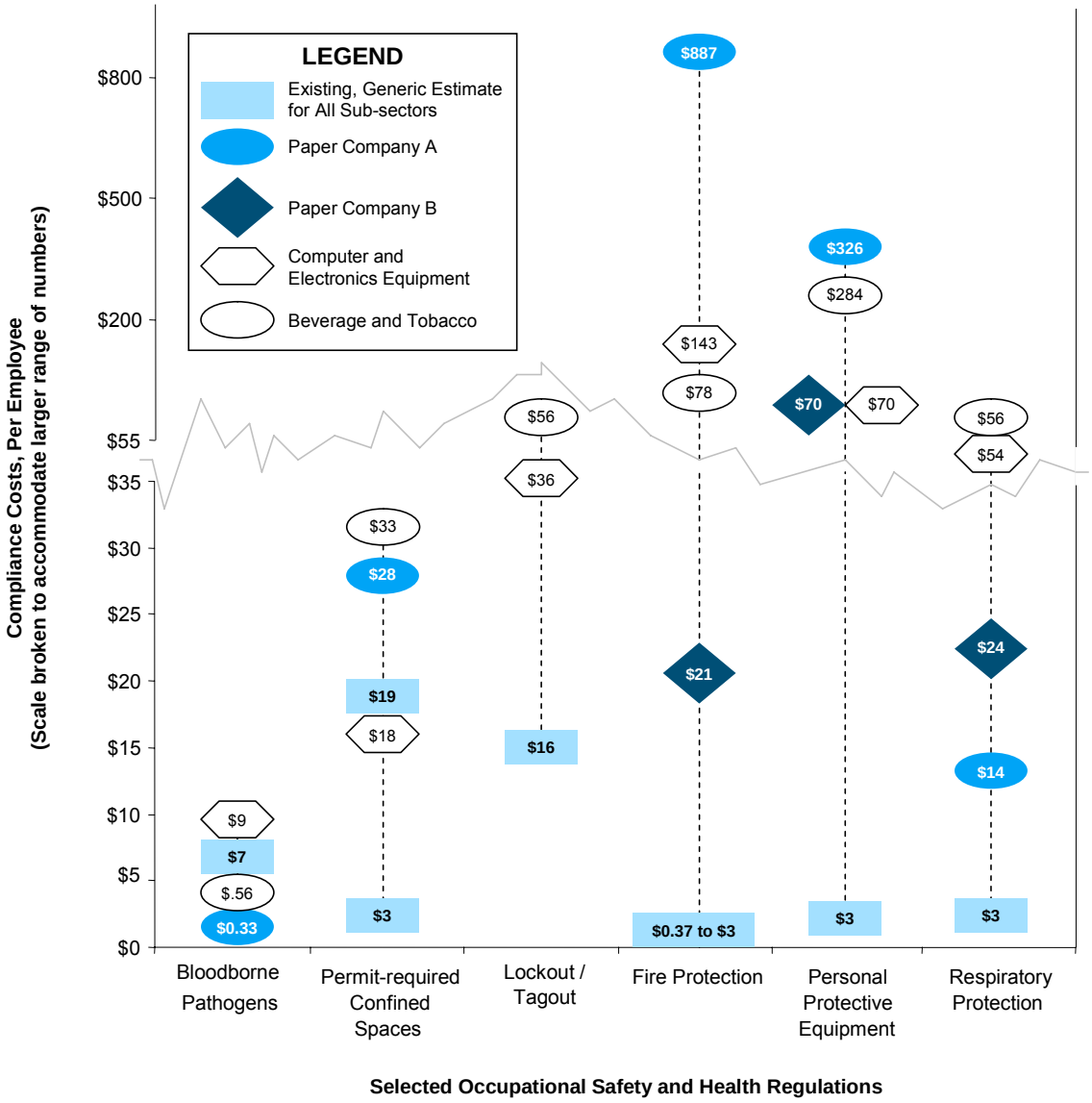
As shown previously in Figure 19, occupational safety and health regulations are the costliest group of workplace regulations to manufacturers in terms of direct expenditures. These regulations cost Virginia manufacturers between $54 million and $109 million in direct expenditures in 2005 and about $83 million in other costs. The direct expenditures include administrative costs, such as documenting and reporting workplace accidents; equipment costs, such as the purchase of personal protective equipment for employees; and capital costs, such as the installation of ventilation units. The most costly regulations are the Hazard Communication, Air Contaminants, Cotton Dust, Lockout/Tagout, Cadmium, and Process Safety Management regulations. Other costs include fines for safety violations and costs that apply only to federal contractors.

Occupational safety and health regulations were the only workplace regulations where case study companies were able to provide more company-specific estimates. Unlike the other types of workplace regulations, the OSHA regulations impacted companies differently depending on their sub-sector or industry. This difference is likely because of the targeted nature of these regulations and the degree to which they regulate certain types of activities performed by workers or handling of certain hazardous chemicals. Because of this variation in impact, case study companies were more likely to report that the average per-employee cost estimates JLARC staff provided either (1) did not apply to their company because they were not subject to the regulation or (2) were not an accurate representation of their company's costs because of the activities performed or chemicals handled by their workers.

In addition, companies generally seemed to have better cost data for occupational safety and health regulations and were able to provide more detailed estimates for these regulations than other types of workplace regulations. For example, paper company B was able to provide an estimate for the personal protective equipment regulation because it tracked the specific protective equipment purchases that year, which in 2005 included 13 hardhats, five safety glasses, 50 pairs of safety boots, and two pairs of gloves.

Based on estimates received from the case study companies, there appears to be substantial variation in the amount each company spends per employee to comply with occupational safety and health regulations. The extent of the variation in company estimates is shown in Figure 20, which plots the company estimates against the existing estimates for certain occupational safety and health regulations. The cost estimates provided by four companies for cer-

Figure 20: Wide Variation Exists Among Case Study Company Estimates of Complying With Certain Occupational Safety and Health Regulations (Per-Employee)



Note: As shown, there was a range of existing estimates for the regulations Fire Protection ($0.37 - $3) and Permit-required Confined Spaces ($3 - $19).

Source: JLARC staff analysis of case study data.

tain regulations were well above the existing cost estimates, with the exception of the Bloodborne Pathogens regulation. The companies stated that industry-specific factors were the reason for their higher costs. For example, the companies' estimates for fire protection were well above the existing estimate. Both paper companies stated that they need to have elaborate fire suppression systems because, as one company put it, "wood and paper burn." The two

paper companies also reported they had a greater need for respiratory protection (such as escape respirators and self-contained breathing apparatuses) than other sub-sectors.

The survey data also underscores the wide variation in per-employee costs for workplace regulations. One manufacturer reported annual workplace compliance costs to be greater than $1 million. The cost of complying with workplace regulations for manufacturers that spend less than $1 million annually ranged from less than $1,000 to $500,000. The per-employee cost of compliance ranged from approximately $0.11 at an electrical equipment/appliance/component manufacturer to $1,538 at a manufacturer in the "miscellaneous" sub-sector. These ranges are diverse because each sub-sector manufactures different products and faces different workplace issues (such as safety and health issues associated with different types of equipment or chemicals used in the manufacturing process), which in turn translates to different workplace compliance costs.

Most Company Concerns Were About Federal Workplace Regulations or Those With Indirect Effects on Manufacturers

Most of the concerns raised by the case study companies were related to federal rather than State workplace regulations.

Most of the concerns raised by the case study companies were related to federal rather than State workplace regulations. For example, two companies indicated that the administration of FMLA was burdensome. In addition, the computer and electronic equipment company and transportation equipment company indicated that the federal COBRA statute is burdensome and that they would not offer health benefits to former employees if they were not required to so by the federal COBRA statute.

Although most of the companies' concerns were related to federal regulations, the computer and electronic equipment company did express concerns about the State's mandated health insurance benefits. Although this requirement applies most directly to insurers and not manufacturers, it is being addressed because it was raised on several occasions during the study. The *Code of Virginia* requires insurers to provide coverage for 23 mandated benefits and 15 mandated providers. (There is only one regulatory requirement for mandated benefits related to reporting requirements.) The costs for these benefits are typically passed along to companies or other entities that purchase these health care plans from the insurers. The computer and electronic equipment company indicated that the mandated health benefits in the *Code of Virginia* require company health plans to be more robust than necessary and substantially increase the company's health care costs.

One company also expressed concern about duplication between Virginia's Workers' Compensation Act and the federal Longshore

and Harbor Workers' Compensation Act. In Virginia, certain workers are allowed to file workers' compensation claims at both the State and federal levels, which effectively doubles compliance costs for certain companies. More information is provided about this issue at the end of this chapter.

Virginia's Workplace Regulations Do Not Appear to Add Substantial Costs Beyond the Federal Regulations

Most workplace regulations affecting manufacturers are federal regulations and these regulations are the major driver of a manufacturer's regulatory compliance costs. The State adds some workplace regulations, but many are similar or identical to the federal regulations. Consequently, Virginia's regulations are a small subset of the workplace regulations with which manufacturers must comply. Table 17 provides a complete list of Virginia's workplace regulations.

Table 17: Virginia's Workplace Regulations

Type	Citation	Title
Labor Standards	16 VAC 15-21	Maximum Garnishment Amounts
	16 VAC 15-40	Virginia Hours of Work for Minors
	16 VAC 15-30	Virginia Rules and Regulations Declaring Hazardous Occupations
Safety and Health	16 VAC 25-30	Regulations for Asbestos Emissions Standards for Demolition and Renovation Construction Activities and the Disposal of Asbestos-Containing Construction Wastes
	16 VAC 25-50	Boiler and Pressure Vessel Rules and Regulations
	16 VAC 25-60	Administrative Regulation for the Virginia Occupational Safety and Health (VOSH) Program
	16 VAC 25-80	Access to Employee Exposure and Medical Records
	16 VAC 25-85	Federal Identical Recording and Reporting Occupational Injuries and Illnesses
	16 VAC 25-90	Federal Identical General Industry Standards
	16 VAC 25-100	Federal Identical Shipyard Employment Standards
	13 VAC 5-51	Virginia Statewide Fire Prevention Code
Workers' Compensation	16 VAC 30-80	Regulations Governing Individual Self-Insurance Under the Virginia Workers' Compensation Act
	16 VAC 30-90	Procedural Regulations for Filing First Reports Under the Virginia Workers' Compensation Act
Civil Rights/ Other	22 VAC 25-10	Regulations to Safeguard Virginian's Human Rights from Unlawful Discrimination
	13 VAC 5-62	Virginia Uniform Statewide Building Code
	16 VAC 20-20	Regulations Governing the Administration of Apprenticeship Programs in the Commonwealth of Virginia

Source: Virginia Regulatory Town Hall.

The State's workplace regulations address labor standards, safety and health, workers' compensation, and civil rights. Occupational safety and health regulations represent the largest proportion of the State's workplace regulations. Half of the 16 State regulations that apply to the manufacturing sector deal with occupational safety and health (including regulations related to boiler and pressure vessels and fire codes), and some of these are similar or identical to the federal occupational safety and health regulations. The rest of the State regulations deal with other workplace issues such as employment discrimination, workers' compensation, and hours of work for minors, and some of these are similar to federal workplace regulations as well.

Because many of these regulations are so similar to federal regulations, Virginia's workplace regulations do not appear to add substantial costs beyond the federal workplace regulations. In cases where the regulations are not similar to federal regulations or appear to have the potential to add costs beyond federal regulations, no cost estimates exist.

Further, manufacturers with whom JLARC staff spoke during case studies indicated that, for the most part, Virginia regulations did not add substantial costs beyond the costs of the federal regulations. Case study participants indicated that certain regulations, particularly the Boiler and Pressure Vessel regulations and the Administrative Regulations for the Virginia Occupational Safety and Health (VOSH) Program, may add costs, but they were not able to provide estimates of these costs. Three survey respondents also felt that the compliance costs for the Administrative Regulations for the VOSH Program were too high and that the costs to the company outweighed the benefits to society. Paper company B commented that the Department of Labor and Industry's (DOLI) enforcement of certain regulations may increase the company's costs. For example, according to the company, DOLI interprets the federal Confined Space regulation in a way that requires the company to label almost all spaces as confined spaces, even spaces that are obvious confined spaces, such as manhole covers. In response, DOLI noted that it interprets the confined space regulation in the same manner as the federal government.

VIRGINIA'S WORKPLACE REGULATIONS FOR MANUFACTURING ARE SIMILAR TO OTHER STATES

The study mandate directs JLARC staff to compare the costs of regulatory compliance for manufacturers in Virginia to other southern and mid-Atlantic states. JLARC staff focused its analysis on other states' occupational safety and health regulations because these regulations comprise the largest percentage of Virginia's

workplace regulations. While a direct comparison of costs is not feasible because no other states have information about their compliance costs, comparing the regulations of each state provides insight into the impact that Virginia's regulations have on manufacturing companies when compared to other states.

Virginia's Manufacturing Environment Provides Useful Context to Compare Workplace Regulations

When comparing states' occupational safety and health regulations, background information on the states' manufacturing environments is useful. Virginia has a lower percentage of manufacturers than most of the comparison states, except for Maryland. However, Virginia's percentage of manufacturing in the two industries with the highest percentages of fatalities and injuries—the fabricated metal and food manufacturing industries—is more similar to the other states. Fabricated metal industries comprised 13.3 percent of Virginia's total manufacturers, which is similar to three of the comparison states (see Figure 21). Two of the selected states have moderately higher percentages: Pennsylvania (19.4 percent) and Tennessee (17.1 percent). Food manufacturers comprise 7.7 percent of Virginia's manufacturing industry. Three of the comparative states have slightly smaller percentages and two have slightly higher percentages (Maryland and Pennsylvania), but in general, the percentages are fairly similar.

Three of the comparison states, in addition to Virginia, are right-to-work states, which means that employees do not have to join unions or pay union fees. This can affect a state's occupational safety and health regulations because of the degree of union activity within the state. In addition, Virginia and three of the other comparison states have contractual agreements with OSHA (called state plans) to operate their own occupational safety and health programs. Under these agreements, OSHA provides up to 50 percent of an approved plan's operating costs if the state develops and operates its own job safety and health programs.

States that have state plans are required to have occupational safety and health standards and regulations that are "at least as effective as" comparable federal standards, and also have the option to promulgate standards covering hazards not addressed by federal standards. For example, the Virginia General Assembly, in tailoring a judicial process through which employers could challenge citations and penalties issued by the VOSH Program, chose to give employers access to the local circuit court system and have the cases tried by the local Commonwealth's Attorney, rather than set up an administrative law judge and review commission system similar to the one used by federal OSHA. In states that do not

Figure 21: Virginia's Workforce, Manufacturing, and Workplace Regulations Compared to Other States

	Workforce Statistics			High-Fatality and Injury Industries				Characteristics of State Workplace Regulatory Framework	
				Fab. Metal		Food			
	% of State Employment in Manufacturing	OSHA State Plan?	Right to Work?	#	%*	#	%*	Supplemental Regulations	Stand-Alone Regulations
Virginia	11.0	Yes	Yes	787	13.3	457	7.7	•Access to Employee Exposure and Medical Records •Administrative Regulation for the VOSH Program	•Boiler and Pressure Vessel Regulations
Maryland	7.6	Yes	No	511	12.8	364	9.1	•Employee Illness & Injury Reports •Formaldehyde •Abatement Verification •Standard for Confined Spaces •Access to Information About Hazardous & Toxic Substances	•Boiler and Pressure Vessel Safety •Personally Identifiable Employee Medical Information •Prohibition on Smoking in an Enclosed Workplace •Consultation Education & Training •Standard for Personnel Platforms Suspended from Cranes, Derricks, & Hoists
Pennsylvania	15.0	No	No	3,228	19.4	1,376	8.3	•Pennsylvania has some specific health and safety requirements for businesses that have self-insured workers' compensation plans (for example, these companies must report certain types of information to the state annually)	
North Carolina	19.8	Yes	Yes	1,471	13.7	554	5.1	•Personal Protective Equipment—General Industry •Shops Fabricating Structural Steel and Steel Plate	•Uniform Boiler and Pressure Vessel Act •Controlled Substances Examination Regulation
Tennessee	18.6	Yes	Yes	1,186	17.1	370	5.3	•Air Contaminants section of General Industry Standards •Hazardous Chemical Right to Know •Sharps Injury Prevention	•Boiler Regulations
Georgia	14.0	No	Yes	1,150	13.1	579	6.6		•Boiler and Pressure Vessel Safety

*Percentage of each state's manufacturing industry.

Source: JLARC staff analysis of federal agency data and state agency responses to JLARC staff regulatory worksheet.

have state plans with OSHA, the federal government administers the states' occupational safety and health programs. An additional benefit of operating a state plan agreement with OSHA is that it requires Virginia to also provide coverage to the 3,962 state and local government employers and the related 216,462 non-federal public sector employees (as of the 4th quarter of 2005.) These groups are specifically not covered when federal OSHA enforces occupational safety and health directly.

Virginia and the Comparison States Have Few State Regulations that Go Beyond Federal Regulations

JLARC staff worked with staff at other state labor agencies to determine to what extent a state goes beyond minimum federal regulatory requirements. To facilitate this comparison, JLARC staff created three categories of workplace regulations: federal, supplemental, and stand-alone. Federal regulations are those in the U.S. Code that apply to all states. Because they apply to all states, these regulations were not included in the other states' review process. The remaining two categories were used to help characterize the extent to which states' workplace regulations go beyond federal requirements.

It appears that federal regulations define most of the safety and health requirements for manufacturers.

Based on JLARC staff analysis of other states' occupational safety and health regulations, the number and impact of occupational safety and health regulations are uniformly low. Virginia and the comparison states have few regulations that go beyond federal occupational safety and health regulations. It appears that federal regulations define most of the safety and health requirements with which manufacturers must comply.

However, there are some differences in the states' regulations. As shown in Figure 21, Virginia has three regulations that differ from federal regulations. Maryland had the most regulations at nine, and the other states had between one and four regulations each.

Comparison States Have Minimal Stand-Alone Regulations. Virginia and the comparison states have only one stand-alone regulation, with the exception of Maryland and North Carolina, which have five and two, respectively. Virginia's single stand-alone regulation deals with the construction, installation, repair, maintenance, and inspection of boilers and pressure vessels; all of the other states in the comparison have a similar stand-alone regulation. States indicated that this regulation has minimal to some impact on manufacturers. Maryland and North Carolina were the only other states that had stand-alone regulations other than boiler regulations. For example, Maryland has a stand-alone regulation prohibiting smoking in enclosed workplaces, and a standard for personnel platforms suspended from cranes, derricks, and hoists which applies mainly

to the construction sector but could also apply to manufacturers in certain cases.

States Have Some Supplemental Regulations, but None Are High Impact. Virginia and the other states studied in this report also have minimal supplemental regulations, and none of the states indicated that these regulations had a major impact on manufacturers, with the exception of one Maryland regulation. Virginia has two regulations that supplement or revise the federal regulations: (1) Access to Employee Exposure and Medical Records and (2) Administrative Regulation for the Virginia Occupational Safety and Health Program. DOLI staff indicated that the Access to Employee Exposure and Medical Records has minimal impact on manufacturers, and the Administrative Regulation for the Virginia Occupational Safety and Health Program is more administrative in nature and would have only minimal cost or fiscal impact.

Maryland has the highest number of supplemental regulations of the comparison states. The abatement verification regulation has a large impact on manufacturers, according to Maryland staff. North Carolina has two supplemental regulations and Tennessee has three, and neither of these states indicated that their supplemental regulations had a major impact on manufacturers. For example, North Carolina's personal protective equipment regulation is only slightly different than the federal regulation and has minimal impact on manufacturers. The regulation for shops fabricating structural steel and steel plate has some impact on manufacturers but only affects companies in the certain industries. Tennessee has three regulations that go beyond federal regulations and did not indicate impact.

WORKPLACE ISSUE FOR FURTHER ANALYSIS AND CONSIDERATION

During the course of its review, JLARC staff identified an aspect of Virginia's workplace regulations that could be further addressed by the Manufacturing Development Commission or other organizations or initiatives. According to the Business Coalition on Workers' Compensation, Virginia's workers' compensation system is efficient compared to other states. Virginia's workers' compensation rate is the lowest of the five states used in the comparative analysis in this review, at $2.20 per every $100 of manufacturing payroll. In addition, in some cases the State's workers' compensation system helps to lower potential liability for companies because they cannot be sued after a worker receives the claim.

However, one aspect of the Virginia workers' compensation system can increase compliance costs for certain companies. Currently, both the Virginia Workers' Compensation Act and the federal

Longshore and Harbor Workers' Compensation Act offer compensation to employees in the maritime industry who are injured on the job. Employees are permitted to file workers' compensation claims under one or both acts (although they can only receive compensation under one act). This results in increased compliance costs for manufacturers that employ these workers. The shipbuilding industry is the manufacturing industry most affected by this issue. There are approximately 21,684 employees in the shipbuilding industry in Virginia, which is about seven percent of the State's manufacturing workforce. The Virginia Workers' Compensation Commission does not track the number of workers' compensation cases in the shipbuilding industry, so the magnitude of the duplicative filing is unclear. However, one company indicated that they have had approximately 8,500 workers' compensation cases over the last five years.

For employees in the shipbuilding industry, the ability to file a claim under one or both acts provides them flexibility to obtain the benefits that best meet their needs. Depending on the nature of the injury, the two acts provide different benefits. For example, the federal act does not cover shoulder injuries but Virginia's act does, so filing a claim under the Virginia act would be more beneficial to an injured worker with a shoulder injury. However, the federal act is generally more favorable to employees because the compensation rates are greater than the State rates.

While the ability to file claims under both acts is beneficial to employees, it is more costly for the employers because they are required to pay the administrative and legal costs associated with both claims. For example, employers have to pay roughly twice the legal, paperwork, and recordkeeping costs if a worker chooses to file claims under both the federal and Virginia acts. One company indicated that these duplicative filings can cost between $1.5 and $2.0 million per year.

The General Assembly has attempted to address this issue numerous times by requiring maritime employees to file claims under the federal act. In 1994, 1995, and 1997, bills were introduced to "exclude from coverage under the Virginia Workers' Compensation Act, any person who is covered by or eligible for benefits with respect to disability or death under the Longshore and Harbor Workers' Compensation Act." However, none of the bills passed. The Maryland legislature has addressed this issue. The Maryland Code excludes from coverage under the state workers' compensation act those employees who are eligible under a federal law (other than the Social Security Act) for benefits for an accidental personal injury or occupational disease.

Chapter 5

Costs and Comparisons for Tax Regulations

In Summary

Tax regulations are highly visible to manufacturers because taxes are paid on a regularly scheduled basis. JLARC staff analysis of existing estimates concluded that the costs to Virginia manufacturers to comply with federal corporate income and payroll and Virginia corporate income taxes range from $113 to $201 million. Virginia manufacturing companies provided information to JLARC staff about their tax compliance costs, which again varied widely depending on their subsector as well as their organizational approach to tax compliance. Much of the compliance costs are driven by recordkeeping required to obtain certain exemptions, which ultimately lowers their tax payment burden. Most of Virginia's tax framework that applies to manufacturers is similar to other selected states. However, Virginia's machinery and tools tax—which is actually an exemption from the business tangible personal property tax—is different from other states because the State's localities each determine both the basis and rate of taxation. Companies identified this tax as an issue that may merit further analysis and consideration.

Tax regulations identify the activities for which government will collect taxes and the rates at which those activities will be taxed. Manufacturing companies in Virginia are subject to taxes at the federal, State, and local levels including corporate income taxes, payroll taxes, sales and use taxes, and local property taxes. In addition, tax credits and audits impose compliance costs on manufacturers.

Tax Payment Burden

Hearings conducted under Senate Joint Resolution 361 (2005) provided insight into the tax payment burden for Virginia's manufacturers. A subsequent report included analysis of the tax payment burden for manufacturing compared to other sectors, and payments in Virginia compared to other states. Consequently, JLARC staff analysis under SJR 360 primarily addressed tax compliance costs.

COSTS TO VIRGINIA MANUFACTURERS OF COMPLYING WITH FEDERAL AND VIRGINIA TAXES

Tax compliance burden consists of the time and money that manufacturers expend each year to comply with federal, State, and local tax regulations. Compliance includes only those activities that would not have been performed for general business operation purposes in the absence of taxation. To determine the cost to Virginia manufacturers of complying with federal and Virginia taxes, JLARC staff analyzed existing estimates, conducted case studies with Virginia manufacturing companies, and analyzed data from a survey of Virginia manufacturers. Table 18 illustrates the federal and Virginia tax framework that formed the basis of the JLARC staff evaluation.

Table 18: Taxes Applicable to Virginia Manufacturers and Associated Compliance Costs

	Type of Tax	Compliance Cost Definition	Examples of Activities Included
State and Federal Taxes	Payroll Taxes	State and federal employee income withholding, as well as remittance of Social Security, Medicare, unemployment insurance, and other payroll taxes.	• Sending out W-2s and VA-6s (annual report to employee of withholding) • Determining withholding amount • Filling out tax forms • Remitting forms and payments to the government • Recordkeeping done specifically for tax compliance
	Corporate Income Taxes	Paying applicable State and federal taxes on a company's income.	• Determining tax liability • Filling out tax forms • Remitting payments to the government • Financial recordkeeping specifically for tax compliance
State and Local Taxes	Sales and Use Tax	Remitting use taxes and verifying non-payment or obtaining refunds for sales tax on exempted purchases.	• Keeping records of purchases • Determining which items are exempt from sales tax • Remitting use taxes to the State
	Machinery and Tools Tax	Identifying which tangible property is "used directly" in manufacturing, and remitting the required tax to the appropriate local government.	• Keeping records of property • Determining which items are subject to the tax and which are not • Determining tax liability • Filling out forms for the machinery and tools tax • Remitting taxes to localities
	Real Property Tax	Challenging property value assessments and remitting the required tax to the appropriate local government.	• Providing documentation in support of physical or economic obsolescence • Challenging classification of property as real property • Remitting taxes to localities

Source: JLARC staff analysis of agency documentation and academic literature.

JLARC Staff Identified and Adjusted Existing Estimates of Tax Compliance Costs

To determine the cost to Virginia manufacturers of complying with federal and Virginia tax regulations, JLARC staff followed four steps:

Step 1: Review and Analyze Existing Estimates. JLARC staff analyzed existing agency, academic, and other cost estimates. Staff used estimates from three reports to estimate Virginia manufacturers' compliance costs for the federal and Virginia tax systems. A study by the Tax Foundation, *The Rising Cost of Complying with the Federal Income Tax*, used form-by-form time estimates from the Internal Revenue Service (IRS) to determine the total cost of the federal tax system to all taxpayers. Another study by the IRS in conjunction with IBM Consulting, *Measuring the Tax Compliance Burden of Small Businesses*, surveyed companies about their

costs. That study asked companies to estimate, both in time and money, the cost of complying with the federal corporate income tax and federal payroll taxes. These survey-based burden estimates become more valuable than form-by-form estimates as more businesses begin to file taxes electronically. Lastly, a study by Mills and Gupta, *Does Disconformity in State Corporate Income Tax Systems Affect Compliance Cost Burdens?*, used survey data from the 1,000 largest American companies to determine the drivers of state income tax compliance. Their study also estimated the size of state income tax compliance costs relative to federal income tax compliance costs.

Step 2: Create Tax-Form-Based Cost Estimates Using the Tax Foundation Study. First, JLARC staff determined the forms that need to be completed for federal corporate income taxes for three types of companies: partnerships, S-corporations, and C-corporations. Each form includes hourly estimates of the time spent on recordkeeping, tax education, form preparation, and packaging/sending. Staff aggregated the hourly estimates for all necessary forms by the type of activity and assigned each activity a wage rate based on Bureau of Labor Statistics data on mean hourly wages in Virginia:

- Recordkeeping hours were monetized using a wage rate of $29.43 for partnerships, $27.37 for S-corporations, and $32.07 for C-corporations.
- Tax education and form preparation hours were assigned a wage rate of $39.74 for S-corporations and partnerships and a rate of $50.20 for C-corporations.
- Packaging/sending hours were assigned a bookkeeping wage rate of $19.12 per hour for all company types.

S-corporations vs. C-corporations

Most large companies are organized as either S- or C-corporations. S-corporations pay no corporate income tax; instead, that liability is passed on proportionally to the company's shareholders. S-corporations have a limited number of shareholders and are typically smaller than C-corporations.

Per-firm compliance costs were calculated for each of the three types of companies (Table 19). Manufacturers with one to 19 employees were assigned the compliance cost estimate for partnerships, manufacturers with 20 to 99 employees were assigned the average of the compliance cost estimates for S-corporations and C-corporations, and manufacturers with 100 or more employees were assigned the compliance costs for C-corporations.

Step 3: Create Per-Firm Cost Estimates from IRS/IBM Study. The more recent IRS/IBM study provided per-firm time estimates for three different sizes of companies: one to 19 employees; 20 to 99 employees; and 100 or more employees. The study then allocated the total compliance hours among an owner or chief executive, executive/professional staff, and clerical/administrative/other staff. JLARC staff used wage rates for each position at each company.

These wage rates were applied proportionally to the total hours per firm to assess a time compliance value, and the average monetary expenditure was added to get a total compliance burden (Table 20). JLARC staff then calculated firm-level burden estimates for each of the three business sizes, which were then multiplied by the respective number of manufacturing firms of each size in Virginia to achieve a statewide compliance cost estimate.

Table 19: Form-by-Form Federal Corporate Income Tax Compliance Estimates

Type of Company	Forms	Per-Firm Compliance Cost
Partnerships/ LLCs	• Form 1065 • Schedule D • Schedule K-1 (Partners' Share of Income) • Schedule L (Balance Sheets) • Schedule M-1 (Reconciliation of Income) • Schedule M-2 (Analysis of Capital Accounts)	$7,206
S-Corporations	• 1120S (S-Corporation) • Schedule D (Capital Gains/Losses) • Schedule K-1 (Shareholders' Share of Income)	$6,950
C-Corporations over $500,000	• Form 1120 (C-Corporation) • 4626 (AMT) • Schedule D (Capital Gains/Losses) • 4562 (Depreciation)	$14,434

Source: JLARC staff analysis of Tax Foundation data.

Table 20: JLARC Staff-Adjusted IRS/IBM Federal Corporate Income Tax and Survey-Based Payroll Tax Compliance Cost Estimates

	Number of Employees in Company	% of Company Time Spent on Tax Compliance, by Position Type: Owner	Executive/ Professional Staff	Clerical/ Administrative/ Other Staff	Average Per-Firm Monetary Expenditure	Total Per-Firm Compliance Costs
Corporate Income	1-19	67%	15%	17%	$1,839	$13,288
	20-99	39%	30%	31%	$4,738	$24,371
	100 or more	21%	48%	28%	$6,262	$51,679
Payroll	1-19	62%	15%	23%	$436	$6,956
	20-99	31%	26%	44%	$858	$9,843
	100 or more	10%	32%	58%	$572	$9,921

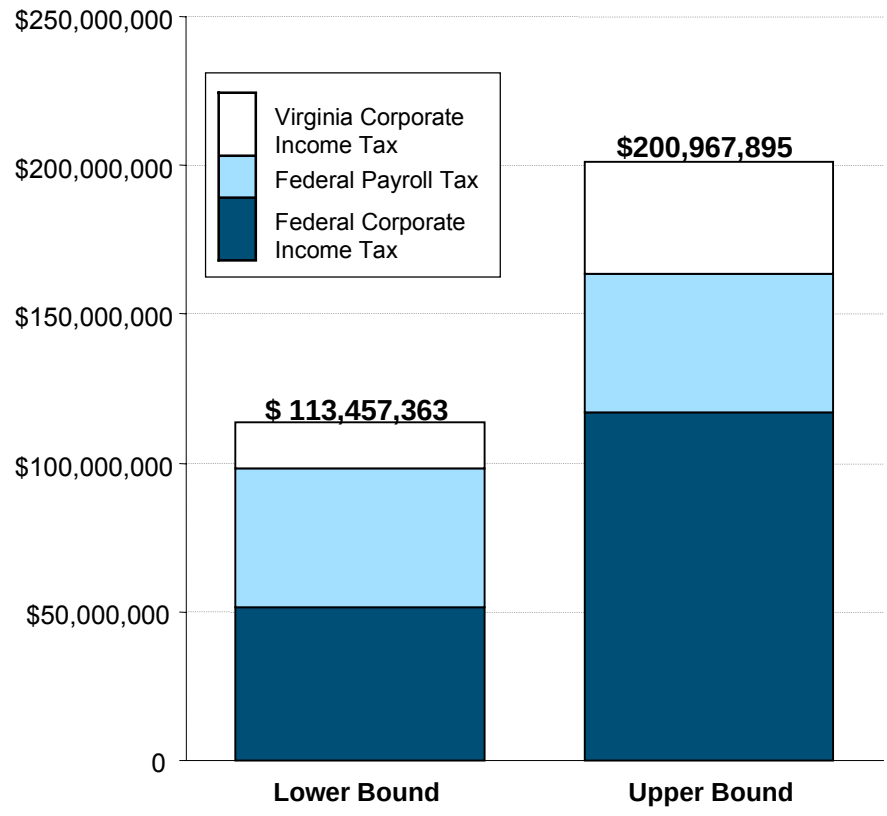
Source: JLARC staff analysis of IRS data.

Step 4: Estimate Virginia Corporate Income Tax Compliance Cost. To estimate Virginia manufacturers' state income tax compliance costs, JLARC staff used ratios derived from the Mills and Gupta study. The study estimated the average state income tax compliance cost to be between 30 and 32 percent of the federal income tax compliance cost. This range was applied to each of the federal income tax compliance cost estimates to determine an estimate for manufacturers' cost of compliance with Virginia corporate income tax compliance.

Cost to Virginia Manufacturers of Complying with Federal and Virginia Taxes Ranges from $114 Million to $201 Million

Cost estimates for Virginia manufacturers to comply with federal corporate income and payroll taxes as well as Virginia corporate income tax in 2005 are shown in Figure 22. The costs range from $113 million, which uses the Tax Foundation corporate income tax compliance estimate, to $201 million, which uses the IRS/IBM estimate.

Figure 22: Range of Annual Costs to Virginia Manufacturers of Complying With Federal Taxes and Virginia Income Tax, 2005



Source: JLARC staff analysis of Tax Foundation, IRS/IBM, and Mills and Gupta data.

These cost estimates indicate a tax compliance cost per employee in the manufacturing sector of between $384 and $680. These costs are approximately one percent of total manufacturing payroll in Virginia. This translates to an average, per-firm compliance cost of between $18,542 and $32,843. While these averages indicate the magnitude of costs statewide, they are a less accurate depiction of the compliance costs faced by a specific company. Per-firm cost estimates by company type and size shown earlier likely provide more precise estimates for particular companies.

There were no existing compliance cost estimates for Virginia taxes other than corporate income tax. These Virginia taxes include sales and use tax, payroll taxes, and local taxes, such as real property, machinery and tools, and motor vehicle tax. These taxes certainly add compliance costs not included in the range of existing estimates discussed above. To better understand the nature and magnitude of these compliance costs, JLARC staff worked with selected manufacturing companies. In general, local tax compliance costs were roughly three-quarters to one-and-a-half times federal tax compliance costs.

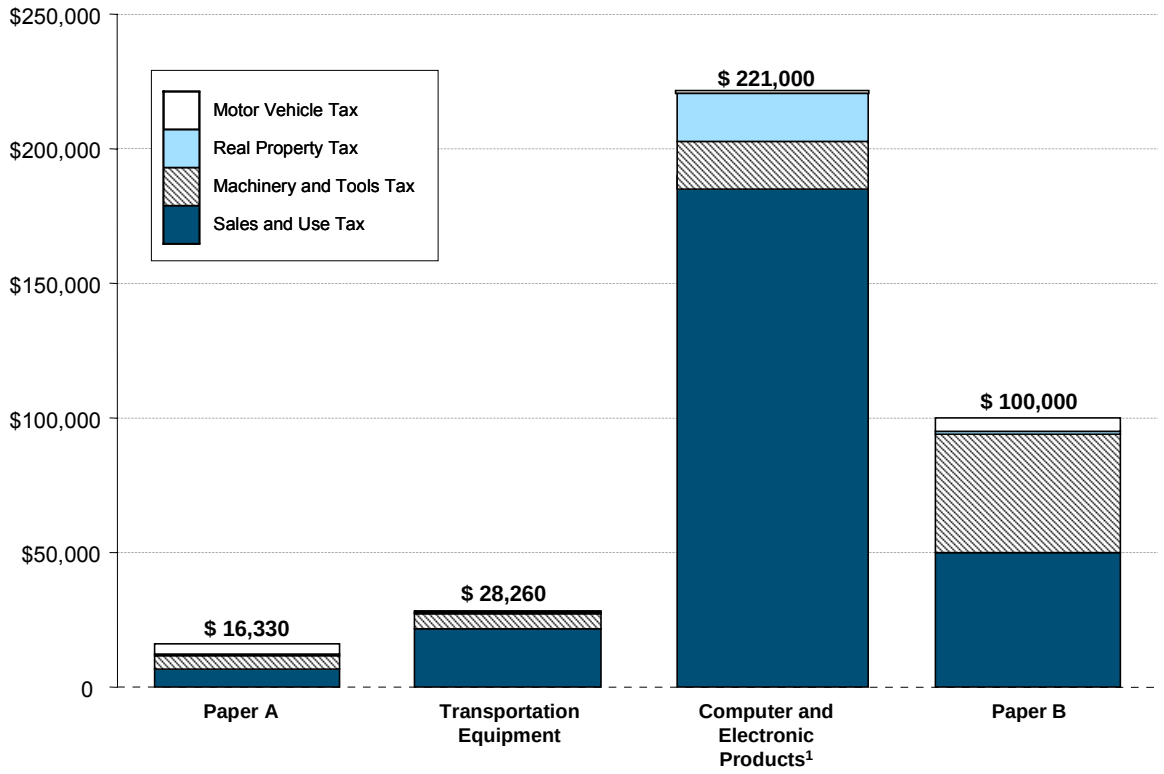
Case Study and Survey Results Provide Insight Into State and Local Tax Compliance Costs

As noted previously, information provided by companies likely has a higher degree of accuracy than aggregate estimates for all companies. This likelihood, along with the lack of existing estimates on compliance costs for most State and local taxes for Virginia, led JLARC staff to work with five Virginia manufacturing companies to determine their tax compliance costs. As with the other regulatory areas in this review, methodological limitations made it difficult to estimate precise compliance costs attributable only to taxation. Because federal tax compliance was done centrally for the case study companies, they had difficulty disentangling federal and Virginia income tax compliance costs. However, the companies had a relatively easier time determining their compliance costs for other State taxes and local taxes. These taxes and information about manufacturers' compliance costs are described below.

Compliance costs did not appear to increase relative to the size of the company.

Total State and Local Tax Compliance Costs for Case Study and Survey Companies Vary Widely. Case study companies reported a wide range of State and local compliance costs ranging from $16,330 for paper company A to $221,000 for the computer and electronic products company (Figure 23). Surprisingly, compliance costs did not appear to increase relative to the size of the company; the transportation equipment company was the largest manufacturer but had the second lowest State and local compliance costs. Costs per employee ranged from $1.52 and $10.88 at the transpor-

Figure 23: Range of Annual State and Local Tax Compliance Costs From Case Study Companies, 2005



Note: Because this figure includes only State and local tax compliance costs, no information is shown for the beverage and tobacco products company. Its total reported tax compliance costs of $147,100 also included federal corporate income tax compliance costs.

[1]The computer and electronics company did not disentangle its real property and machinery and tools tax compliance costs, so each is represented in the figure as half of the total cost reported for both taxes combined.

Source: JLARC staff analysis of case study responses.

tation equipment company and paper company A, respectively, to $159.79 at the computer and electronics product company and $166.67 at paper company B. Sales and use tax compliance was by far the largest burden for every case study company that broke out costs for that category. As a percentage of tax payments, compliance costs were also highest for the sales and use tax.

Six survey respondents also estimated their total cost of complying with tax regulations. Five of these respondents indicated costs of between $0 and $250,000, with one respondent indicating costs of over $500,000.

Exemptions and Recordkeeping Drive Sales and Use Tax Compliance Costs. Each of the case study companies that identified specific sales and use tax compliance costs indicated that they were the largest burden, eclipsing the combined compliance cost of all other local taxes. Virginia imposes a statewide tax of four per-

cent and a corresponding local tax of one percent on all sales of tangible personal property. There is a corresponding use tax of the same rate that applies to use or consumption of goods, but an item is only subject to this tax if it is not already subject to the sales tax. The main difference between the sales tax and the use tax is that the compliance costs for sales tax fall on the seller while use tax compliance is the responsibility of the purchaser.

Manufacturers enjoy broad exemptions from the sales and use tax because they do not pay sales tax on their inputs or items used directly in the manufacturing process, including machinery and tools. They do, however, pay sales and use taxes on items not used directly in the manufacturing process, such as office equipment. While the exemptions benefit manufacturers by lowering their tax liability, the exemptions actually appear to raise compliance costs because the company must determine which items are taxable and which are not.

Another reason that sales and use tax compliance costs are relatively higher than other taxes is that companies must reconcile this tax each month. Companies noted that exemptions from the tax require them to keep extra records that indicate whether an item was used in an exempt or non-exempt activity. Paper company B noted this can be very complicated because production workers are focused on using the items needed to build a product, not limiting tax liability. As an indication of the complexity of sales and use tax recordkeeping, paper company B indicated that it overpaid sales and use tax by $150,000 over three years, which amounts to an annual overpayment of 20 percent of their total sales and use tax burden. The company noted it did this to avoid penalties and relied on the State audit to reimburse them for overpayment.

Manufacturers' Personal Property Exemption

The *Code of Virginia* classifies "capital which is personal property, tangible in fact, used in manufacturing (including but not limited to furniture, fixtures, office equipment and computer equipment used in corporate headquarters…)" as intangible property. Since intangible property is segregated for state taxation and taxed at a rate of 0%, any personal property of manufacturers that is not machinery and tools, motor vehicles, or delivery equipment is exempt from property taxation.

Paper company A's experience with sales and use tax illustrates how the different approaches that companies take to address compliance issues can result in very different compliance costs. The company designed an invoice system that identifies each purchase with a use code. These classifications are understandable to floor personnel and indicate the exempt or non-exempt nature of the item's use. This system requires minimal human intervention and considerably lowers the number of employee hours spent reconciling this tax.

Manufacturing Exemption Also Drives Machinery and Tools/ Business Personal Property Tax Compliance Costs. The three case study companies that provided specific cost estimates for the machinery and tools (M&T) tax indicated that it was the second largest source of their local property tax compliance costs. The M&T tax is a type of business personal property tax that specifically ap-

plies to manufacturers. Manufacturers are only required to pay local personal property tax on tangible property "used directly" in the manufacturing process. All other tangible personal property of manufacturers other than motor vehicles is exempt from personal property taxation. In practical terms, this exemption applies mainly to office furnishings and supplies and is an incentive to locate corporate manufacturing headquarters in the State.

In addition to this exemption, the tax rate on machinery and tools can be no higher than "the rate imposed on the general class of tangible personal property" according to the *Code of Virginia*. This affords localities the opportunity to tax machinery and tools at a lower rate. Seventy of 129 cities and counties have a lower rate of taxation for M&T. However, this lower rate of taxation does not necessarily translate into a lower effective tax rate on M&T. JLARC staff analyzed rates for 145 localities and found that the effective M&T tax rate was, in some years, higher than the effective tangible property tax rate on non-manufacturing tools and machinery for 39 percent of these localities.

Effective Rates on Machinery and Tools Vary

While the nominal rate of taxation on M&T is controlled by the *Code of Virginia*, localities set the assessment rate for property taxes. The rate of assessment is most often a percentage of original cost and can decrease over the lifespan of a piece of equipment. Assessment rates combine with the nominal rate to create the effective rate of taxation ($ of tax / property value) in a given year.

M&T tax compliance costs generally stem from time and materials used in determining which items are "used directly" in the manufacturing process and therefore subject to the tax. While in many cases this determination is straightforward, for items such as computers used to run machinery, sometimes the distinction is not as clear. Local commissioners of the revenue have discretion to determine what constitutes machinery and tools, but manufacturers have the option of appealing those decisions to the Department of Taxation (TAX).

Real Property Tax Compliance Costs Primarily Incurred if Assessments Are Challenged. The case studies that identified specific real property compliance costs showed a high degree of variability in these costs. The computer and electronics company incurred compliance costs of $30,000 while paper company B indicated its compliance costs were only $1,000. The transportation equipment company and paper company A each reported compliance costs of less than $1,000. The transportation equipment company and paper company B indicated that most of their real property compliance issues had been settled in past years, limiting their current annual compliance costs. This is another example of the methodological limitation whereby the year in which compliance costs are assessed can lead to wide variation in the amount of costs for a company in a given year.

Real property tax applies to manufacturers in essentially the same way as it applies to residential owners and other types of businesses. The real property tax base is the value of land, structures, and any fixtures including pipes and cables which are deemed to

be a property improvement. Local governments are responsible for periodically reassessing the fair market value of taxable real property, so compliance costs for manufacturers primarily occur only if they choose to challenge these assessments.

Two issues complicate the assessment of the fair market value of the real property of manufacturers, which in turn can increase compliance costs: obsolescence and the M&T tax. Determining the obsolescence of real property causes compliance costs at each reassessment if manufacturers choose to provide evidence to assessors supporting their claims of decreased property value. The M&T tax creates additional complexity because certain fixtures can be classified as machinery and tools for taxation purposes. For example, pipes that carry drinking water are considered real property while those that carry welding gas are considered machinery and tools. These generally create one-time compliance costs that occur in the year in which manufacturers choose to settle these classification issues with the locality.

Motor Vehicle Tax Compliance Costs Are Minimal. As was shown in Figure 23, motor vehicle tax compliance costs were a relatively small percentage of total compliance costs for the case study companies that specifically estimated these costs. The motor vehicle fuel tax applies to manufacturers only when the fuel is used in vehicles that travel on the roads of the Commonwealth. Manufacturers use those same fuels to power some of their production machinery as well as vehicles that are used entirely or in part in off-road activities, such as warehousing. Fuels used in these activities are exempt from the motor vehicle fuel tax, and here again the record-keeping required to capitalize on this exemption drives compliance costs for manufacturers.

Tax Audit Compliance Costs Vary by Frequency and Focus of Audit. Both the federal and Virginia governments conduct periodic audits of all companies, including manufacturers, to determine if they have represented their tax liability truthfully in past tax filings. The IRS conducts federal corporate income tax audits sporadically, visiting some companies every year while visiting other companies less frequently. This can cause wide variation in the compliance costs of different companies, as the frequency and depth of audits drive audit compliance cost.

Federal Audit Frequency Varies

One case study company indicated that it had been audited twice in the last five years while another company had not been audited since 1993. The company assumed they had not been audited because it had no profits and therefore no tax liability.

According to TAX, it focuses its limited audit resources where it can reap the most revenue, which causes larger companies to be audited more often, on average, than smaller companies. The manufacturers in the case studies for this report indicated that they are audited once every three years and that the tax department examined all three years between audits. The TAX audit

covers all State taxes including corporate income, sales and use, and employee income withholding.

Not surprisingly, therefore, the case study companies reported a wide range of compliance costs for dealing with federal and Virginia audits. The transportation equipment company indicated that each federal audit costs them about $108,000 while the State audits cost them around $27,000 per audit. Paper company A noted compliance costs of $5,500 for its State tax audit, which consisted of the time spent pulling records and interacting with auditors. Paper company B indicated State audit compliance costs of $25,000 per audit and noted it had not been audited by the federal government since 1993.

Tax Credit Compliance Costs Incurred in Pursuit of Lower Tax Liability. Tax credits exist at both the State and federal levels to offset tax liability and are awarded for a variety of activities, such as job creation or investment in research. Depending on the credit, various agencies are responsible for determining eligibility and awarding the credit. Compliance costs for tax credits consist of activities required to verify eligibility but not the activities for which the credit is being awarded. Interestingly, both manufacturing companies and TAX officials indicated that tax credits are usually not sufficient incentive to significantly change behavior but do alter the timing of certain activities. Incentives offered by localities through their local economic development authorities can often have a larger impact than the State tax credits.

Case study companies were asked to identify which tax credits they had applied for and/or received over the past five years and to estimate their compliance cost for each of the credits. Paper company B had no tax liability and therefore had not applied for any tax credits. This company expressed concern that most credits are not refundable and therefore are of little use to companies that are not making a profit. The computer and electronics company reported spending $1,200 complying with the federal research credit, for which it received $20 million in reduced tax liability. The transportation equipment company also participated in the federal research credit at a compliance cost of $3,600 and was able to abate $2 million in federal income tax liability over two years. This company also reported participating in Virginia's Neighborhood Assistance tax credit at a compliance cost of $90, lowering their State income tax burden by $35,000.

TAXES ON MANUFACTURING COMPARED TO TAXES ON OTHER BUSINESS SECTORS

Despite the exemptions discussed above, most taxes apply to non-manufacturers in the same way they apply to manufacturers.

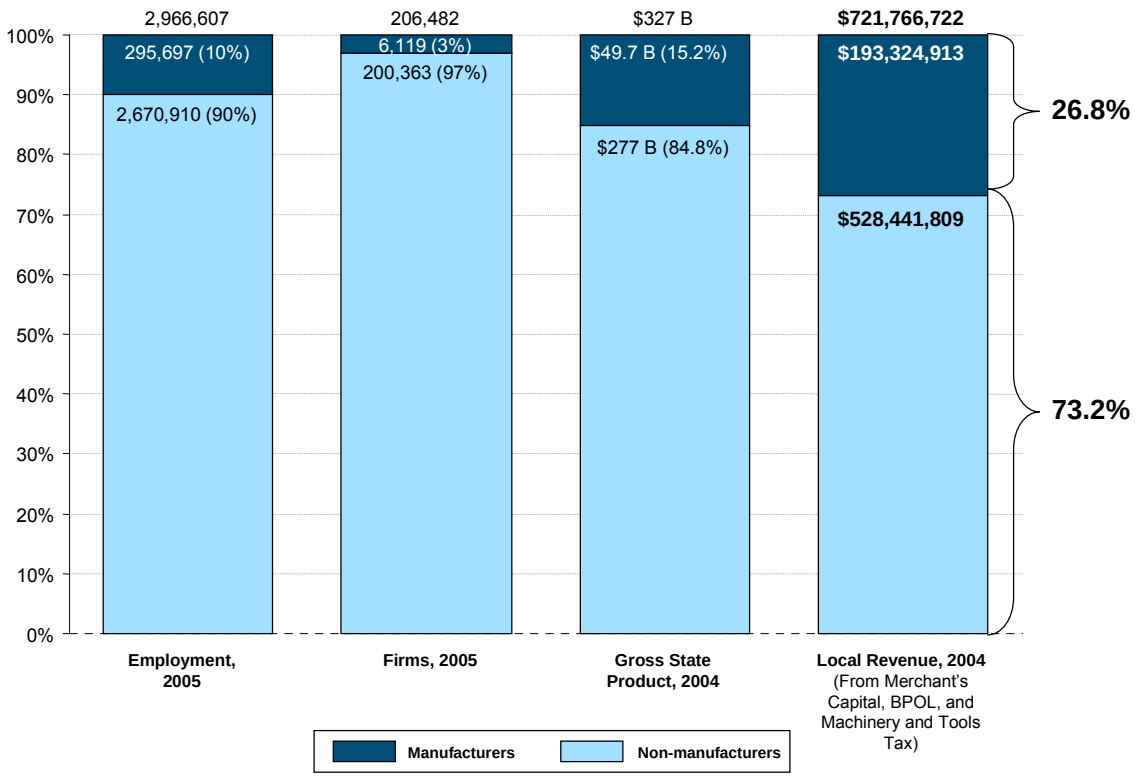
Businesses in other sectors pay corporate income tax, payroll taxes, real property tax, and motor vehicles taxes in the same way as manufacturers. However, because manufacturers generally use more tangible personal property than other sectors, it appears that the State has over time developed a tax framework to tax manufacturers' personal property differently. As noted above, while manufacturers enjoy exemptions from the sales and use tax for purchases of production equipment and inputs, other businesses are only exempt for purchases for resale. Manufacturers also enjoy an exemption from the local tangible personal property tax for items not used directly in manufacturing, and additionally, the rate on their tangible personal property (M&T) can be no higher than that imposed on other tangible personal property. These exemptions lower the tax burden of manufacturers but increase the complexity of the tax system and therefore increase compliance costs.

Exemptions lower the tax burden but increase the complexity of the tax system.

In contrast, non-manufacturers are generally subject to one of two local taxes that manufacturers do not pay: the Business, Professional, and Occupational License tax (BPOL) or the merchant's capital tax. A locality can only impose one of these taxes on any given business. The BPOL tax is generally levied as a percentage of the gross receipts of a company, with localities setting rates and assessment bases. Some localities impose a flat "license fee" to the gross receipts tax, and others exempt gross receipts under a certain threshold. The merchant's capital tax is a tax on the inventory of stock on hand, daily rental cars, daily rental property, and tangible personal property for sale as merchandise. Forty-nine Virginia counties and all of the cities use the BPOL tax in lieu of the merchant's capital tax. The remaining 46 counties impose a merchant's capital tax because they are not allowed to impose an additional BPOL tax in towns within their borders that already impose a BPOL tax.

In FY 2004, BPOL and merchant's capital tax together accounted for 5.4 percent of total revenue for cities, 3.5 percent for counties, and 10 percent for towns. In comparison, M&T made up 1.9 percent of total revenue for cities, 1.4 percent for counties, and 2.2 percent for towns. Manufacturers' share of local revenue from merchant's capital, BPOL, and M&T is about 27 percent (Figure 24). This is higher than its proportional percentage of the State's economy in terms of employment, the number of firms, and total gross state product. Given the local focus on taxing capital, as discussed above, and the capital-intensive nature of the manufacturing sector, this finding is not surprising. Work done under SJR 361 looked at the effective rate of taxation on manufacturing compared to other sectors and reached a similar conclusion.

Figure 24: Manufacturers' Share of Local Business Taxes Is Higher Than Their Share of Other Measures



Source: JLARC staff analysis of Weldon-Cooper Center and U.S. Census data.

VIRGINIA'S TAX FRAMEWORK COMPARED TO OTHER SELECTED STATES

The study mandate directs JLARC staff to compare the cost of tax compliance for manufacturers in Virginia to other southern and mid-Atlantic states. While a direct comparison of costs is not feasible because other states do not have information about compliance costs for manufacturers in their states, comparing the tax framework of each state provides insight into the impact that Virginia's taxes have relative to other states' taxes.

Of the states selected, Virginia's reliance on manufacturing as a percent of gross state product is comparatively low. Approximately 15 percent of Virginia's gross state product is attributable to manufacturing, higher only than Maryland at about eight percent. North Carolina and Tennessee have about 27 percent of their gross state product from manufacturing (Figure 25).

Most of Virginia's Tax Framework Is Similar to Other Selected States

Overall, Virginia's tax framework is not substantially different from other selected states. Nationwide, 45 states and Washington, D.C., impose a corporate income tax, and each state has a different system from the others as well as from the federal corporate income tax. The main difference is how each state's tax base differs from the federal tax base. Most states start with the federal tax base and then allow or disallow various deductions and depreciation rules. States also differ from each other in their reporting and filing procedures which determine whether related business entities can or must file together or separately.

The particular state in which a company does business does not have a significant effect on state corporate income tax compliance costs.

Compliance costs for manufacturers are primarily driven by the state's lack of uniformity with the federal system, but increase with each additional state in which a company files a return. The Mills and Gupta study looked at the drivers of state tax compliance costs for large companies and found that the state in which a company does business does not have a significant effect on state corporate income tax compliance costs. Rather, total state tax compliance costs are primarily driven by the number of different states in which a company conducts business.

Large manufacturers, like many businesses, have operations in multiple states and therefore must apportion their income to each of those states for corporate income tax purposes. Forty states currently use a three-factor formula basing taxable income on the proportion of a company's total property, payroll, and sales in the state. Virginia uses the double-weighted sales factor, which is the most common apportionment formula. This is calculated by averaging the proportion of a company's total property, payroll, and sales located in Virginia but averaging in the sales proportion twice. More emphasis on the sales a company makes in a state is beneficial to capital-intensive businesses with large payrolls like manufacturers. Virginia, North Carolina, Tennessee, and Georgia all currently use the double-weighted sales factor. Maryland currently uses only the sales factor when apportioning income for manufacturers, and Georgia is phasing in a sales-factor only system statewide over the next two years.

The selected states each impose different rates for their sales and use tax, and Virginia's is one of the lowest. The only major difference between the states is that Virginia, North Carolina, and Georgia exempt production equipment from the tax while Maryland and Tennessee give a tax credit for manufacturing equipment purchases. Finally, three of the states impose a tax that Virginia does not. North Carolina, Tennessee, and Georgia impose a fran-

Figure 25: Virginia's Manufacturing and Tax Framework Compared to Other States

	Manufacturing As % of Gross State Product	Corporate Income Tax Apportionment	Sales and Use Tax		Business Tangible Personal Property Tax			Franchise Tax for Manufacturers
			Rate[1]	Production Equipment Purchase	Basis	Rate	Non-production equipment	
Virginia	15.2%	Double-weighted sales	5%	Exemption	Set by localities	Set by localities	Exemption	No
Maryland	8.3%	Sales-only for manufacturers	5%	Tax Credit	Statewide standard	Set by localities	No Exemption	No
Pennsylvania	20.8%	Triple-weighted sales	6%	Exemption	Varies	Varies	Varies	Yes
North Carolina	27.9%	Double-weighted sales	7%	Exemption	Statewide standard	Set by localities	No Exemption	Yes
Tennessee	27.1%	Double-weighted sales	8.5 – 9.75%	Tax Credit	Statewide standard	Set by localities	No Exemption	Yes
Georgia	17.5%	Double-weighted sales	5 – 8%	Exemption	Statewide standard	Set by localities	No Exemption	Yes

[1] Range is due to variation in how localities choose their rates.
Note: All selected states set the frequency of payroll tax withholding the same as federal requirements. All selected states also allow localities to determine real property tax rates.

Source: "Multi-state Corporate Tax Guide," 2005, JLARC staff analysis of state tax codes and state-agency response to JLARC staff tax worksheet.

chise tax, which is a tax on the company's net worth that can include real and tangible property, gross receipts, and retained earnings.

Virginia's Machinery and Tools Tax Is Different From Other Selected States

All comparison states have a local tax on the tangible personal property of businesses. However, Virginia is the only state that exempts manufacturers' business property not used directly in manufacturing from this tax. Virginia is also the only state that exempts idle machinery from personal property taxation.

Additionally, Virginia is the only one of the selected states that allows localities to set their own assessment ratios and depreciation rates. In all other selected states, the state sets assessment ratios and depreciation rates and/or performs the assessment at the state level and the localities then set the rate of taxation. This lack of uniformity makes it very difficult to compare effective M&T tax rates across localities.

TAX ISSUE FOR FURTHER ANALYSIS AND CONSIDERATION

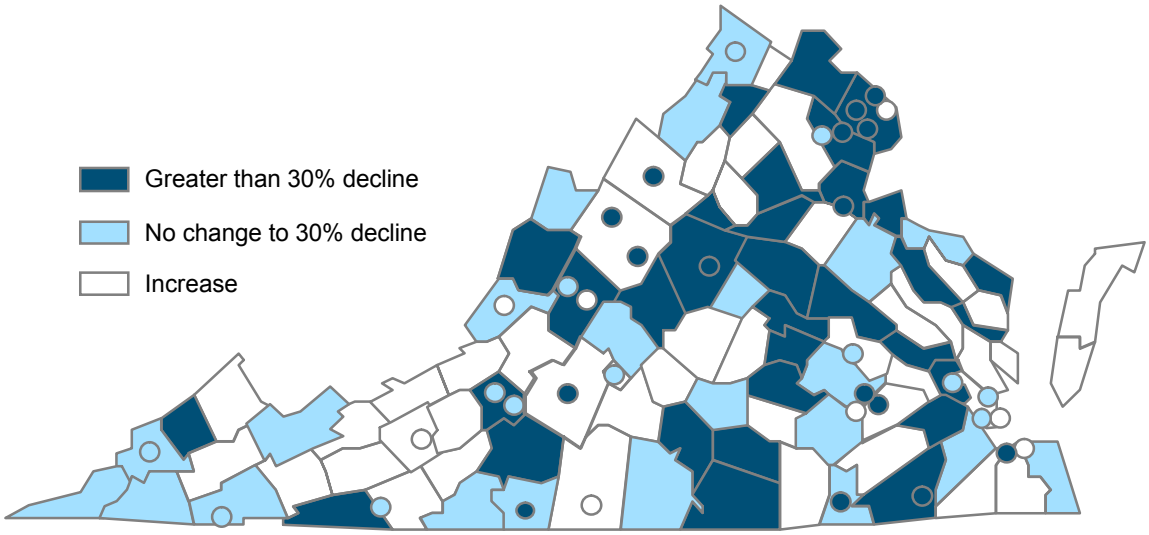
Eliminating the M&T tax was the most cited regulatory issue on the JLARC staff survey of Virginia manufacturers. Statewide, Virginia manufacturers paid over $193 million in 2004 (the most recent year complete data is available) in M&T to localities. This represented 1.57 percent of total local revenue in 2004 and was less than two percent of the manufacturing sector's value added in that year.

The decline in manufacturing during the last decade has led to fewer localities in recent years relying heavily on the M&T tax for local revenue (Figures 26 and 27). Since 1995, 45 localities have experienced a 30 percent or greater decline in the portion of local revenue that comes from the M&T tax. Some localities have experienced particularly large declines, such as Martinsville, which dropped 84 percent. In 2005, the localities that still rely heavily on M&T tax for local revenue include the town of West Point, the city of Covington, and Henry County at 46, 35, and 13 percent, respectively.

Eight localities rely on the machinery and tools tax for more than ten percent of their local revenue.

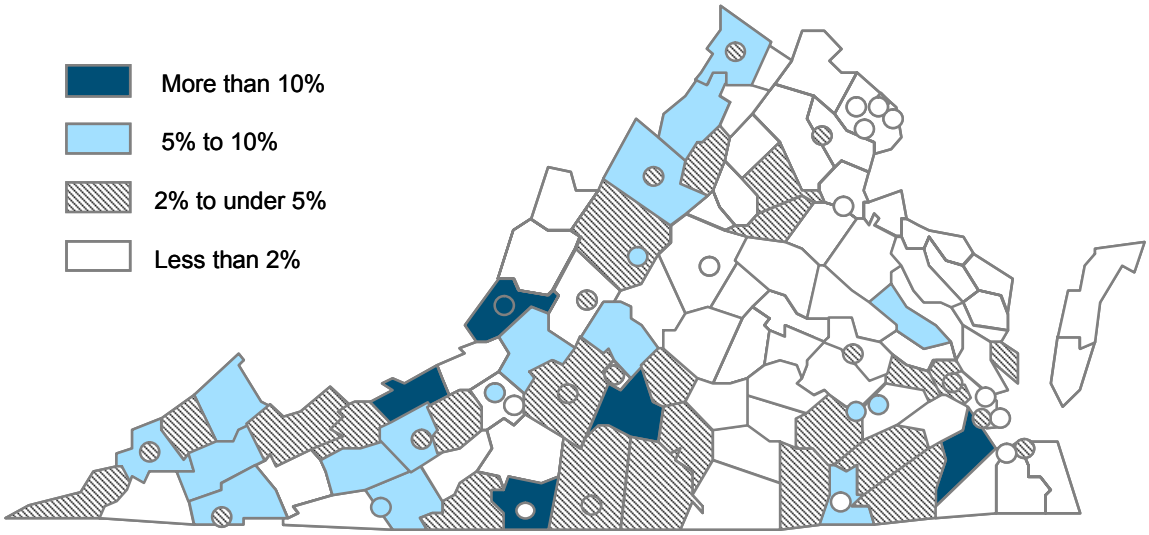
In total, one city, five counties, and two towns rely on the M&T tax for more than ten percent of their local revenue, while 20 other localities collect between five and ten percent of their local revenue from the tax. In general, localities in the southern and western

Figure 26: Change in Percent of Local Revenue From Machinery and Tools Tax, 1995 to 2005



Source: JLARC staff analysis of *Comparative Report of Local Government Revenues and Expenditures*, Auditor of Public Accounts.

Figure 27: Percent of Local Revenue From Machinery and Tools Tax, 2005



Source: JLARC staff analysis of *Comparative Report of Local Government Revenues and Expenditures*, Auditor of Public Accounts.

parts of the State rely more on the M&T tax for local revenue than do other localities. Towns rely more heavily on the tax than cities and counties. In total, 59 percent of Virginia's localities obtain less than two percent of their revenue from M&T.

Virginia is the only state among those selected for review in which localities set both the evaluation basis and taxation rate that applies to manufacturers' machinery and tools. The Commonwealth gives localities the flexibility to determine their own M&T evaluation basis and rates, similar to other taxes including personal and real property taxes. Localities contacted for this review noted that they believe this flexibility is consistent with Virginia's historical tendency towards local control on many issues, including other taxes, social services, and education. They also noted that it allows localities to change their M&T tax as they believe necessary along with other economic development factors, such as company-specific tax credits or incentives, in order to build their local economy.

The M&T tax is itself an exemption for manufacturers from the business personal property tax paid by other types of businesses. Furthermore, manufacturers do not pay the BPOL tax that applies to most other types of business. Without these exemptions, manufacturers would likely pay even more taxes (Table 21). This is primarily because they pay no property tax on non-production tangible property and may pay a lower property tax rate on production tangible property. Manufacturers also do not pay a gross receipts or net worth tax while most non-manufacturers do.

The magnitude of the taxable capital owned by manufacturers can still lead to relatively higher taxes than for other sectors.

Although the tax system confers advantages to manufacturers, this does not necessarily lead to lower tax payment burden in comparison to non-manufacturers. The magnitude of the taxable capital owned by manufacturers can still lead to relatively higher taxes than for other sectors. Large manufacturers in particular can have substantial amounts of capital equipment and property. For example, one case study company reported having approximately $550 million in equipment at a single facility while another reported having approximately $532 million in real estate at one facility.

The exemption for non-production tangible property, as well as the lower M&T property tax rate, only applies to businesses defined by the Virginia Department of Taxation as manufacturers or mines. Capital-intensive, industrial businesses not classified as manufacturers, such as refining operations, are not allowed these advantages. In addition, capital-intensive, non-industrial businesses such as data processors do not receive the sales tax exemption for their capital purchases.

Table 21: Manufacturers Are Taxed Differently Than Non-Manufacturers

	Real Property	Non-Production Tangible Property		Production Tangible Property		Gross Receipts and/or Net Worth
		Sales Tax	*Property Tax*	*Sales Tax*	*Property Tax*	
Manufacturer	Taxed at same rate	Yes	No	No	Yes, at a lower rate	No
Non-Manufacturer	Taxed at same rate	Yes	Yes	No[1]	Yes, at the standard rate	Yes

[1]As long as production is "industrial in nature."

Source: JLARC staff analysis of the *Code of Virginia*.

The review mandated by SJR 361 found similar results. According to *Virginia Taxes Paid by Manufacturers*, manufacturers have a higher effective tax rate than the agriculture, retail, professional services, or information sectors. Possible changes to Virginia's approach to M&T were discussed during the SJR 361 hearings. Consequently, legislation to standardize the assessment approach and relax the definition of exempted idle equipment was passed during the 2006 General Assembly. The Governor vetoed these bills, citing the impact it would have on local revenue. The veto statement initiated a task force to study the issue.

JLARC staff discussed Virginia's M&T tax with manufacturers, localities, the Virginia Manufacturers Association, Virginia Municipal League, Virginia Association of Counties, Virginia Chamber of Commerce, and Virginia Economic Development Partnership. Virtually all parties, including the Virginia Manufacturers Association and manufacturers, agree that taxes are not the major driver of decisions by existing business to expand or new companies to build new facilities. All organizations contacted also agreed that standardizing the M&T would make it easier for new companies and existing companies with facilities in multiple localities to calculate their M&T taxes. There was disagreement, however, about whether and to what extent changes would encourage more new capital investment.

Several states, most recently Connecticut, have made changes to eliminate or phase out local property taxes on manufacturing machinery and equipment. However, as with any tax change, the possible effects of similar changes in Virginia depend largely on how the change is designed and implemented. Regardless of how the tax was changed, the budgetary difficulties would be considerable for local governments.

Given that very few localities have their M&T structured the same way, a first step would be to decide how to standardize the ap-

proach statewide. This standardization could include standardized assessment and valuation methods, standardized rates, or a cap on the rate of taxation. Even if a standardized approach could be determined, any resulting changes in the M&T tax would likely benefit companies in localities with heavy reliance on M&T far more than manufacturers in localities with lower reliance on the tax. This means that the positive impact of any such change would primarily accrue to a minority of Virginia's manufacturing companies. The manufacturers in the eight localities that rely on the M&T for ten percent or more of their revenue employ about 19,500 employees, or less than seven percent of the State's total manufacturing employment. These same localities collect about 16 percent of the total machinery and tax revenue across the State.

Chapter 6

Regulations Add Costs, But Other Factors Also Challenge Manufacturers

In Summary

The different compliance cost estimates for environmental, economic, workplace, and tax regulations can be totaled using two approaches. Approach #1 results in estimated compliance costs of around $1 billion while approach #2 results in compliance cost estimates of between $1.19 billion and $3.49 billion. Without question, federal regulations add substantial costs for U.S. manufacturers. However, Virginia's regulations generally do not go substantially beyond federal requirements nor are they substantially different from other southern and mid-Atlantic states. Virginia-initiated regulations, therefore, do not appear to add substantial costs for manufacturers operating in Virginia. Moreover, globalization, technological improvements, and increased labor costs were the drivers of the most recent period of job loss in Virginia's manufacturing sector, not Virginia's regulations. Any efforts to foster stronger manufacturing in Virginia should consider the complex set of factors that influence manufacturing, which include workforce issues and transportation.

The preceding chapters of this report address the impact of complying with environmental, economic, workplace, and tax regulations. Totaling the cost estimates from each chapter yields insight into the impact of these regulations on Virginia manufacturers. However, placing these costs and the regulations that drive them in context is critical to fully comprehending their impact and determining how to foster a stronger manufacturing sector in Virginia.

APPROACH #1 COST ESTIMATE IS AROUND $1 BILLION WHILE APPROACH #2 IS AS HIGH AS $3.49 BILLION

JLARC staff analyzed compliance costs for Virginia's manufacturers in Chapters 2 through 5. The JLARC staff-adjusted estimates for all manufacturers can be totaled to derive an estimate of total compliance costs for all Virginia manufacturers. JLARC staff used two approaches to derive the cost estimates. Approach #1 included only direct cost expenditures while approach #2 included direct costs plus other types of costs.

The total compliance cost estimate using approach #1 is between $923 million and $1.16 billion, as shown in Figure 28. Environmental regulations are the primary driver of these compliance costs, representing between one-half and two-thirds of total direct costs. The total compliance cost estimate using approach #2 is from $1.19 billion to $3.49 billion. Environmental and economic regula-

tions drive the increase and together account from nearly 60 percent to more than 80 percent of total direct and other costs.

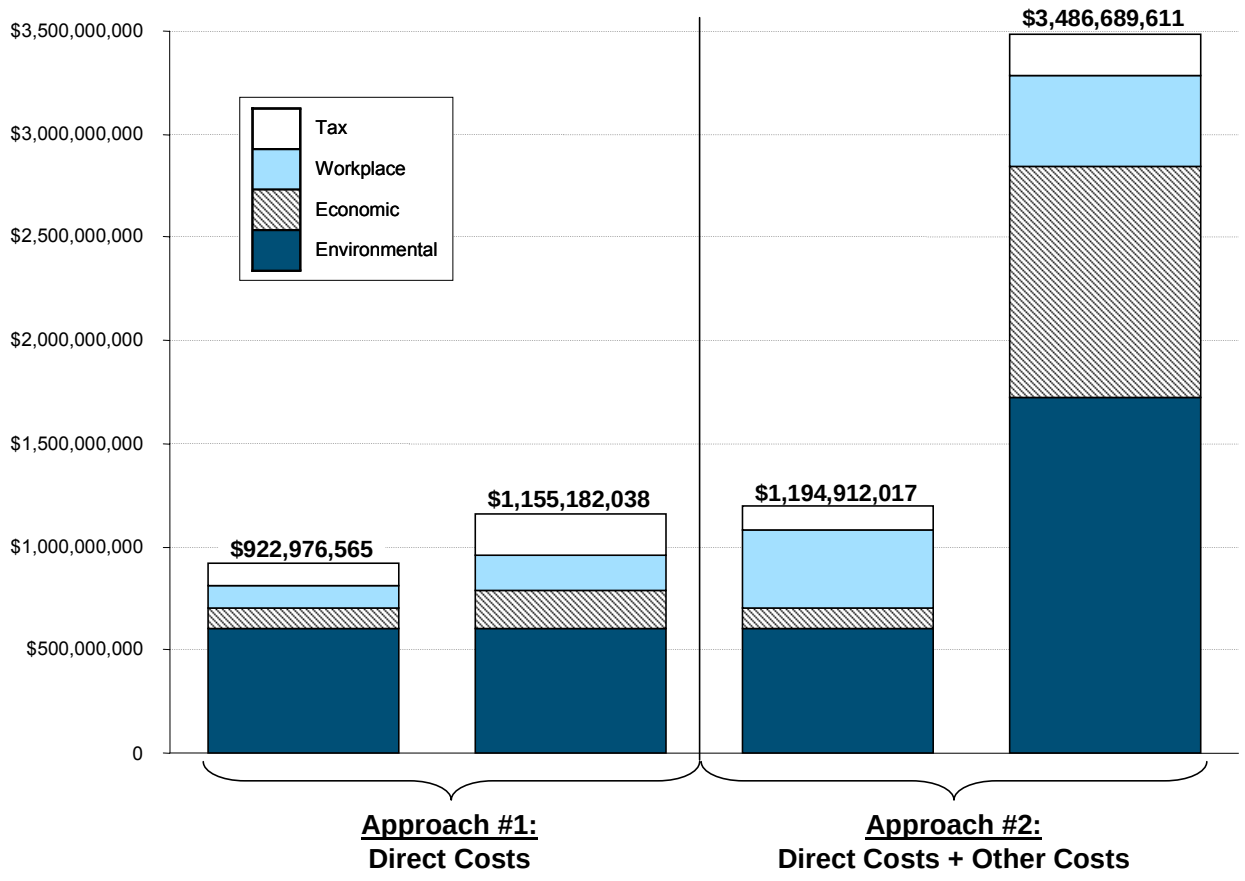
Including other costs, such as the opportunity cost of lost production efficiency, is the major reason why approach #2 results in a substantially higher estimate. Including these less measurable types of costs produces cost estimates with a higher degree of uncertainty than cost estimates based only on direct costs that are actual expenditures made by companies.

Table 22 places these large numbers in some context. Estimated compliance costs, on average, ranged from just over $150,000 to nearly $570,000 for each of Virginia's manufacturing establishments. The compliance costs, once standardized by the number of manufacturing employees in Virginia, equates to an average cost of between $3,121 and more than $11,700 per employee. These compliance costs equal between eight percent and 29 percent of manufacturing payroll in Virginia. The costs represent between approximately 1.9 percent and seven percent of the total value-added for the sector and between about one-third of a percent and one percent of the total gross state product.

The case studies with Virginia manufacturers and results from the survey of Virginia manufacturers yield several themes. First, in all regulatory areas, companies had difficulty disentangling (1) costs attributable to regulation versus costs they would otherwise incur and (2) costs resulting from federal regulation versus costs resulting from State regulation. Second, though companies had some difficulty determining costs, the estimates they provided are likely more precise and have a higher degree of certainty for their company than do aggregate estimates for all companies. Finally, compliance costs for individual manufacturers can vary widely and may or may not depend on their sub-sector, size, organizational efficiency and culture, and the year costs are measured.

As discussed throughout this report, companies were also able to provide information that gives insight into the nature of manufacturers' compliance activities and costs. For example, despite the overall difficulties of directly attributing specific expenditures to specific regulations, companies could identify activities they would undertake whether regulations required them to or not, including certain pollution abatement activities and employee safety measures. Additionally, the proportions of case study companies' costs were at times surprising. For example, environmental permit fees are an ongoing area of discussion and concern among legislators, the Virginia Department of Environmental Quality (DEQ), and companies. However, environmental permit fees paid to the government actually represented the smallest of all environmental compliance cost categories for the case study companies.

Figure 28: Total Cost for Manufacturers to Comply with Federal and State Regulation Is From $923 Million to $3.49 Billion



Source: JLARC staff-adjusted existing estimates of regulatory compliance costs.

Table 22: Costs to Virginia Manufacturers of Complying With Regulation Per Establishment, Employee, and as Percentage of Other Relevant Measures

	Amount (2005)	Approach #1	Approach #2
Establishments	6,119	$150,838 – $188,786[1]	$195,237 – $569,814
Employees	295,697	$3,121 – $3,907[2]	$4,041 – $11,791
Payroll	$11,915,146,000	7.7% – 9.7%	10.0% – 29.3%
Value Added	$49,714,651,000	1.9% – 2.3%	2.4% – 7.0%
Total Gross State Product	$352,745,000,000	0.3%	0.3% – 1.0%

[1] Cost is provided as per Virginia manufacturing establishment.
[2] Cost is provided as per Virginia manufacturing employee.

Source: JLARC staff analysis.

VIRGINIA REGULATIONS LARGELY MIRROR FEDERAL REQUIREMENTS AND DO NOT ADD SUBSTANTIAL COSTS

Virginia's regulations generally do not go substantially beyond minimum federal requirements, or include regulations without a clear purpose or intent. This conclusion results from several findings. First, while Virginia's regulations in some cases differ from other states, primarily for certain environmental regulations and taxes (especially the machinery and tools tax), its regulations are overall similar to those of the other mid-Atlantic and southern states examined during this review. This is in part because, as noted above, Virginia overall closely mirrors federal regulations. As further evidence of the similarity between Virginia's regulations and those of other states, nearly 60 percent of companies with facilities in other states that responded to the JLARC staff survey reported that Virginia's regulations make it equally attractive to manufacturers when compared to other states. Only 22 percent of companies responding said that Virginia's regulations make it less attractive than other states. These companies were in the paper, chemical, rubber and plastics, and printing sub-sectors.

Sufficient data is not—and will likely never be—available to conduct a full cost-benefit analysis of all federal and Virginia regulations. However, there is some evidence that suggests that, overall, the benefits to society of Virginia's regulations are at least equal to and likely outweigh its costs to manufacturers. In most circumstances, Virginia either closely mirrors federal regulations or deviates from them based on Virginia's unique needs. These deviations or additions generally have a clear purpose, and while they impose costs on manufacturers, they also yield benefits for Virginia's natural environment, employees, and consumers. Therefore, it is reasonable to assume that the tendency for benefits of federal regulation to be greater than costs, as discussed in Chapter 1, could also be applied to Virginia.

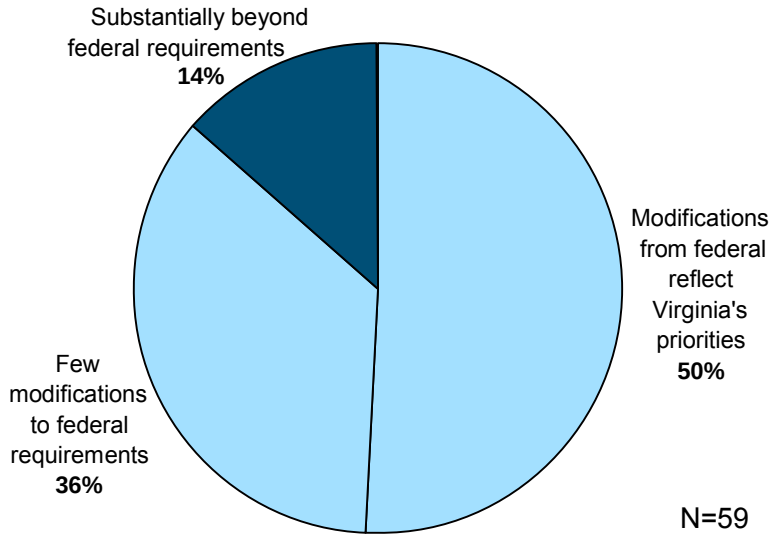
Second, Virginia's regulatory process is a long-term, public approach to considering new regulations or changes to existing regulations. This process, along with legislative review of proposed regulations, appears to eliminate regulatory provisions that are unreasonable or not feasible in terms of compliance. The willingness of executive branch agencies to engage and partner with manufacturers during the regulatory development process appears to limit the scope of regulations and appears to prevent regulations with overall costs that exceed overall benefits. For example, DEQ Technical Advisory Committees help ensure from the beginning of the regulatory process that proposed regulations will be as cost efficient and targeted as possible. According to environmental advocacy organizations, this approach has contributed to a scenario in

which Virginia's environmental regulations do not go substantially beyond federal requirements.

Third, the majority of Virginia manufacturers that responded to the JLARC staff survey believed Virginia makes few modifications to federal regulations and the modifications reflect Virginia's priorities (Figure 29). Only 14 percent believed that Virginia regulations go substantially beyond federal requirements.

Finally, instances in which companies actually "over-comply" by going beyond minimum federal and State requirements is additional evidence that in certain cases the benefits of Virginia's regulations outweigh the costs. This arguably means the effective compliance cost for these companies is zero because companies would be doing what regulations require of them, along with additional activities, even if the regulation did not exist. In these circumstances, the benefits that accrue elsewhere are likely increased as well, including benefits to the natural environment, human health, or worker safety. Nearly 80 percent of the companies responding to the survey of manufacturers reported they go above and beyond minimum regulatory requirements in certain areas. Going beyond minimum worker safety requirements and minimum environmental controls were each cited in 36 percent of responses. Consumer safety was cited in 12 percent of the responses. Corporate leadership making the issue a priority was the reason cited most frequently for going beyond minimum requirements, followed by employee safety and enhanced public perception (Figure 30).

Figure 29: Few Manufacturers Perceive that Virginia's Regulations Go Substantially Beyond Federal Requirements



Source: JLARC staff survey of Virginia manufacturers, 2006.

Figure 30: Virginia Manufacturers Go Beyond Minimum Regulatory Requirements for Various Reasons

Note: Forty-seven companies answered the question, but were asked to select multiple reasons. This resulted in 203 total reasons being identified by companies.

Source: JLARC staff survey of Virginia manufacturers, 2006.

FACTORS OTHER THAN VIRGINIA REGULATIONS PRESENT GREATER CHALLENGES TO MANUFACTURERS

Determining what, if anything, to do differently in Virginia to support and recruit manufacturers requires understanding the complex set of circumstances that confront the sector. This review suggests that Virginia regulations are an integral part, but not the primary factor that impacts manufacturers' decision-making. Addressing the range of factors that impact manufacturing appears to be the most prudent way to foster a strong manufacturing sector in the State.

Virginia Regulations Were Not the Primary Reason for Manufacturing's Decline

Virginia lost 66,000 manufacturing jobs between 2000 and 2005, now employing about 296,000 people. This five-year loss represented nearly 20 percent of the State's total manufacturing employment. While this job loss is indisputable, the root cause of this job loss is attributable to many factors, including globalization, technological improvements, and changes in input costs and pricing power as discussed in Chapter 1. Furthermore, manufacturing job loss has been a recent trend in other states, nationwide, and in

other industrialized nations, suggesting that the cause of the job loss was not unique to Virginia.

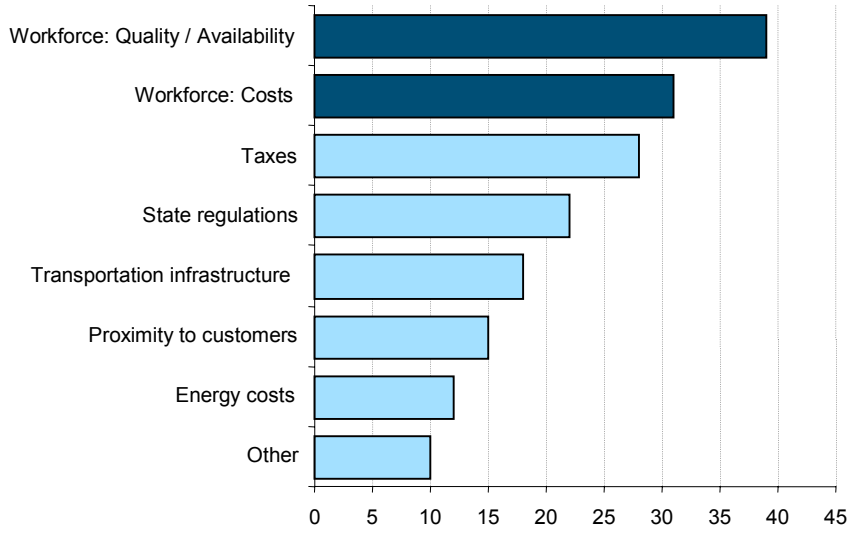
Several reviews, including this one, have found that government regulations are only part of the complex set of drivers that influence the private sector. For example, in January 2006, *Chief Executive Magazine* asked CEOs to rate the most important factors when deciding where to locate. The quality of the workforce was rated as most important. In April 2006, a major transportation equipment maker that was seeking to locate a new facility said it would make its decision primarily based on the quality of the workforce, proximity of the new location to its other plants, and proximity to its customers.

Workforce considerations were the major drivers of business decisions.

The JLARC staff survey of Virginia manufacturers yielded similar results, with manufacturers reporting that workforce considerations were the major drivers of their business decisions, followed by taxes and regulations (Figure 31). The quality and availability of the workforce and workforce costs, including healthcare and benefits, accounted for 40 percent of the factors cited. Taxes were the third most widely cited factor, followed by regulations and then transportation infrastructure.

The ranking of these factors, when considered along with the relative stability of Virginia's regulations prior to and during the time

Figure 31: Workforce Has the Biggest Impact on Whether to Stay in Virginia, Open a New Facility, or Close an Existing Facility



Note: Sixty-one companies answered the question, but were asked to select multiple factors. This resulted in 175 total factors being identified by companies.

Source: JLARC staff survey of Virginia manufacturers, 2006.

of the most significant job loss, suggests that Virginia regulations were not the primary driver of the job loss. More broadly, Virginia typically ranks highly when compared to other states on a range of factors intended to quantify the extent to which a state is attractive to business:

- Virginia was ranked the best overall state for business in 2006 and has three localities among the top 15 in the nation when ranked by cost of doing business, job growth, and educational attainment, according to *Forbes.com*.
- Virginia was cited as the second most business-friendly state in 2006 by Pollina Corporate Real Estate.
- Virginia has the lowest state and local business tax as a share of gross state product compared to the five other states selected for comparison in this JLARC staff review.

Nature and Impact of Manufacturing Decline Vary by Manufacturing Sub-Sector and Locality

Below the surface of the manufacturing sector's job loss, there is an even more dramatic story of job loss in certain manufacturing sub-sectors. The apparel, textile mill, and paper sub-sectors lost one-third or more of their total employment between 1997 and 2004 (Table 23). Companies in sub-sectors with the most dramatic

Table 23: Changes in Manufacturing Employment, by Sub-Sector

	Employment		
Sub-Sector	**1997**	**2004**	**% Change**
Transportation equipment	36,747	38,533	4.9%
Nonmetallic mineral product	12,114	12,268	1.3
Textile product mills	4,175	4,104	-1.7
Wood product	20,199	18,753	-7.2
Plastics and rubber products	21,726	20,032	-7.8
Food	33,702	30,982	-8.1
Miscellaneous	9,620	8,522	-11.4
Chemical	20,246	17,272	-14.7
Printing and related activities	20,779	17,549	-15.5
Primary metal	7,342	6,106	-16.8
Fabricated metal product	20,444	16,867	-17.5
Electrical equipment and computer	11,673	9,114	-21.9
Furniture and related product	23,642	17,633	-25.4
Paper	15,747	10,905	-30.7
Machinery	21,116	14,482	-31.4
Textile mills	20,726	13,457	-35.1
Beverage and tobacco product	13,273	8,248	-37.9
Computer and electric product	29,885	15,231	-49.0
Apparel	25,877	3,315	-87.2

Source: JLARC staff analysis of Annual Survey of Manufacturers, U.S. Census Bureau, 2001-2004.

The most labor-intensive manufacturing sub-sectors that have diminished will not likely return.

job losses have consolidated with other companies, moved to other countries, or disappeared. Given the issues, especially globalization and differences in labor costs by country discussed in Chapter 1, the most labor-intensive manufacturing sub-sectors that have diminished likely will not return.

The decline in most sub-sectors appears to have moderated in recent years, and a few sub-sectors are now seeing net creation of new manufacturing jobs. Nearly 42,000 new manufacturing jobs were announced between 2001 and 2005. Transportation equipment, wood, furniture, and computer and electronics accounted for nearly half of those jobs.

Even within sub-sectors that appear to be doing well, company-specific or industry-specific factors can have a major impact. For example, transportation equipment manufacturing was one of only two sub-sectors that grew in employment between 1997 and 2004. However, a major Virginia employer in that sub-sector announced a plant closing in 2006. The company specifically noted that Virginia's taxes were not one of the factors driving the decision to close the plant. Rather, there were sub-sector and company-specific factors, including consumer demand being lower than production capabilities, that led to the decision to close the facility and reduce excess production capacity.

As noted in Chapter 1, the impact of the manufacturing decline on local employment has been significant in certain localities. However, most localities have since been able to slow the job loss and in several instances gain new manufacturing jobs. For example, in 1997, Martinsville had 5,134 manufacturing jobs. By 2001, the manufacturing employment base had declined nearly 70 percent to only 1,921 jobs. But after that major decline, the job loss moderated and manufacturing employment eventually increased to 2,140 jobs in 2004, an 11 percent rise from 2001.

Fostering Manufacturing in Virginia Requires Considering Factors Other Than Virginia Regulations

Nationally, manufacturing is recovering as the domestic economy has improved. According to the Bureau of Economic Analysis, manufacturing profits have quadrupled since 2001 and now exceed profit levels reached during the early to mid-1990s. The U.S. Department of Commerce attributes some of this strength to the continued productivity of manufacturing, which exceeded four percent in 2005 and outpaced the sector's 3.7 percent average annual growth rate of the 1990s.

In Virginia, the loss of manufacturing jobs has moderated and Virginia's economy overall is strong, with unemployment slightly

Sweeping changes to Virginia's regulations would not be feasible or prudent.

above three percent. Overall, Virginia's regulations closely follow federal regulations and deviations appear to be based on Virginia's needs. The State's national reputation as a business-friendly state and the results of this review suggest that, overall, Virginia's regulations are generally sound. Simply stated, sweeping changes to Virginia's regulations would not be feasible or prudent.

To maintain and develop a strong manufacturing sector it appears that there are some issues that may be more critical for manufacturers than the costs to comply with Virginia regulations. Any efforts to support manufacturing would need to consider the wide range of these factors that are impacting the sector. Possible questions to facilitate these considerations are listed in Exhibit 1.

For example, as JLARC staff have noted in previous reports, an effective and well-coordinated statewide approach to building a workforce is particularly needed. According to the Virginia Manufacturers Association, an effective plan would ensure Virginia's workforce includes people with the necessary technical skills to conduct current and projected manufacturing work, particularly in the southern and western regions of the State. Additionally, a sound energy plan and approach to develop the State's transportation infrastructure, especially in areas such as short rail that can

Exhibit 1: Considerations for Fostering Virginia's Manufacturing Sector

- What role will manufacturing play in Virginia's future economy? How will the manufacturing sector's role in the State economy change or evolve over time?
- How can Virginia complement and benefit from the federal American Competitiveness Initiative, particularly on nationwide and international issues primarily beyond Virginia's control?
- What are the manufacturing sub-sectors Virginia wishes to recruit? What are the manufacturing sub-sectors Virginia wishes to maintain and support?
- In what factors that influence private sector decision-making does Virginia have an advantage? Which manufacturing sub-sectors in particular would be interested in these factors? In what factors does Virginia need to improve, and who needs to participate in the improvement initiatives?
- How can the perspectives of citizens, interest groups, manufacturers, and other stakeholders be weighed and considered? What trade-offs will be necessary?

Source: JLARC staff analysis of interviews with Virginia executive branch agencies, Virginia Manufacturers Association, Virginia Economic Development Partnership, Virginia Chamber of Commerce, manufacturing companies located in Virginia, and environmental advocacy groups.

American Competitiveness Initiative

National strategy introduced by federal agencies in 2006 to

- encourage investment in manufacturing research and development;
- increase job training; and
- raise student achievement in math, science, engineering and technology.

Federal agencies have pledged more than $136 billion to support this initiative during the next ten years.

be used by manufacturers in certain parts of the State, would appear necessary. Finally, any efforts to support the sector would need to articulate how Virginia can complement the federal American Competitiveness Initiative, particularly on international trade and global competitiveness issues that are largely beyond Virginia's control.

In conclusion, the Manufacturing Development Commission and other initiatives present opportunities to further address these considerations. Any efforts to foster stronger manufacturing in Virginia should account for the trade-offs that may be necessary and fully consider the range of impacts not only to manufacturing companies, but to the natural environment, local communities, employees, and consumers. Without such a comprehensive perspective, it is likely that the approach will be too narrow and not appropriately examine the full range of considerations.

Appendix A

Study Mandate

SENATE JOINT RESOLUTION NO. 360

Directing the Joint Legislative Audit and Review Commission to study the comparative burden of regulatory compliance on Virginia's manufacturing sector. Report.

Agreed to by the Senate, February 8, 2005
Agreed to by the House of Delegates, February 24, 2005

WHEREAS, the manufacturing sector, which accounts for almost 12 percent of Virginia's total gross state product and employs nearly 300,000 Virginians, is a crucial part of the Commonwealth's economy; and
WHEREAS, while aspects of the sector are faring well, Virginia's manufacturers have shed approximately 68,000 jobs over the past five years, with nearly 9,000 of these jobs being lost in the past year; and
WHEREAS, while rising productivity accounts for some of the employment losses in Virginia's manufacturing sector, a 2003 study by the Manufacturers Alliance/MAPI concludes that the ability of manufacturing firms to compete with low-cost producers in other countries is impaired by comparatively high employee benefits, corporate tax rates, energy costs, costs of tort litigation, and costs of regulatory compliance; and
WHEREAS, the Manufacturers Alliance/MAPI study concludes that the total cost of complying with environmental, economic, workplace, and tax regulations incurred by United States manufacturers is approximately $160 billion, which is the equivalent of a 12 percent excise tax on manufacturing production; and
WHEREAS, at the national level, the burden of complying with certain classes of regulation, such as pollution abatement and worker health and safety, falls disproportionately on manufacturers; and
WHEREAS, the aggregate costs to Virginia's manufacturers of complying with regulations imposed by the federal and state governments have not been quantified; and
WHEREAS, the regulatory compliance costs borne by Virginia manufacturers have not been compared to the regulatory compliance costs borne by other sectors of the Commonwealth's economy; and
WHEREAS, the regulatory compliance costs imposed on Virginia manufacturers have not been compared to those imposed on manufacturers in other states with which the Commonwealth competes for jobs and investments; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the Joint Legislative Audit and Review Commission be directed to study the comparative burden of regulatory compliance on Virginia's manufacturing sector.
In conducting its study, the Commission shall include among other things an evaluation of (i) the total cost of compliance by Virginia manufacturers with state and federal environmental, economic, workplace, and tax regulations; (ii) how the cost of regulatory compliance borne by Virginia manufacturers compares to the regulatory compliance costs borne by firms in other major sectors of Virginia's economy, in the aggregate, on a per-employee basis, based on the sectors' contributions to gross state product, and other relevant bases; and (iii) how the cost of regulatory compliance borne by Virginia manufacturers compares to the regulatory compliance costs borne by manufacturers in other mid-Atlantic and Southern states, in the aggregate, on a per-employee basis, based on the sectors' contributions to gross state product, and other relevant bases.

All agencies of the Commonwealth shall provide assistance to the Commission for this study, upon request. The Commission shall complete its meetings by November 30, 2006, and the Director of the Commission shall submit to the Division of Legislative Automated Systems an executive summary of its findings and recommendations no later than the first day of the 2007 Regular Session of the General Assembly. The executive summary shall state whether the Commission intends to submit to the General Assembly and the Governor a report of its findings and recommendations for publication as a House or Senate document. The executive summary and report shall be submitted as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports and shall be posted on the General Assembly's website.

Appendix B

Research Activities and Methods

JLARC staff completed seven major research activities to address the study mandate:

1. Researching regulatory analysis methods and previous attempts to measure regulatory costs;
2. Defining the Virginia regulatory framework;
3. Conducting literature reviews and analyzing existing cost estimates;
4. Conducting case studies with selected Virginia manufacturers;
5. Surveying Virginia manufacturing companies;
6. Collecting regulatory information from other states; and
7. Interviewing other organizations.

Additional methodological information is contained in the Technical Appendix to this report (available at http://jlarc.state.va.us), including existing estimates, sample background and supplemental worksheets, and a sample copy of the survey.

RESEARCHING REGULATORY ANALYSIS METHODS AND PREVIOUS ATTEMPTS TO MEASURE REGULATORY COSTS

JLARC staff identified existing documentation and studies on the issue of regulatory analysis. Much of this documentation was from federal agencies, non-profit organizations, and academicians and economists. This documentation indicated the methodological limitations of attempting to determine the benefits and costs of regulations.

Documents produced by two government organizations conveyed some important lessons learned that were applied during the planning phase of this review.

- In 1999, JLARC's peer organization in Florida, the Office of Program Policy Analysis and Government Accountability (OPPAGA), was asked to identify the cost of regulatory programs and activities. Rather than attempt such a study, OPPAGA informed the Florida legislature of the difficulty in completing such a review and identified a possible approach

to estimate the costs of state regulation. OPPAGA recommended that the Florida legislature provide between $2.6 and $3.5 million to the Governor's office so that private economists and consultants could be hired to answer the question.

- Three years prior in 1996, Congress asked the U.S. Government Accountability Office (GAO) to investigate the cumulative impact of federal regulations on businesses. GAO attempted to identify the impact of federal regulations on those businesses by asking them to identify which regulations applied to them, the costs and other impacts of those regulations, and the regulations that were most problematic. Most of the business associations and other groups GAO contacted did not nominate companies to participate in the review. Ultimately, 15 companies provided information to GAO. However, none of the companies could develop a complete list of regulations that applied to them, citing the difficulty of disentangling federal and state regulations. Furthermore, none of the companies could provide data on the cost of complying with regulations.

The remaining research activities were heavily influenced by these previous attempts and the corresponding methodological limitations. Critical elements of the JLARC review include working with executive branch agencies to define the regulatory framework prior to contacting companies and working with the Virginia Manufacturers Association (VMA) to identify companies willing to provide information to JLARC staff.

DEFINING THE VIRGINIA REGULATORY FRAMEWORK

No comprehensive information existed about the federal and State regulatory framework that applied directly to manufacturing companies in Virginia. Consequently, JLARC staff conducted independent research and worked with the following executive branch agencies to identify the environmental, economic, workplace, and tax regulations:

- Virginia Department of Agriculture and Consumer Services;
- Virginia Department of Environmental Quality;
- Virginia Department of Labor and Industry;
- Virginia Department of Planning and Budget; and
- Virginia Department of Taxation.

A comprehensive list of statutes and regulations was developed working with these agencies. These statutes and regulations were used as the basis for determining compliance costs.

CONDUCTING LITERATURE REVIEWS AND ANALYZING EXISTING COST ESTIMATES

To estimate the cost of compliance for environmental, economic, workplace, and tax regulations, JLARC staff first conducted a review of existing federal agency and academic estimates of regulatory impact. This review identified existing estimates that were used to determine the Virginia-specific compliance cost estimates for manufacturers. JLARC staff adjusted these existing estimates as needed to derive a Virginia-specific estimate for the manufacturing sector.

Review, Analyze, and Determine Which Existing Estimates Provide the Most Feasible Starting Points

Because there was no comprehensive source of existing estimates, JLARC staff began by identifying as much of the existing body of work on regulatory impact as possible. In each regulatory area, several documents provided feasible starting points for further analysis (Table 1).

Table 1: Primary Source Documents and Use by JLARC Staff to Derive JLARC-Adjusted Estimates

Functional Area	Primary Source Document(s)	Used by JLARC Staff As Starting Point For ...
Environmental	Pollution Abatement Capital Expenditures survey, U.S. Census Bureau and Environmental Protection Agency, 1999	Expenditures reported by companies to comply with federal, state, and local environmental regulations.
	The Impact of Regulatory Costs on Small Firms, by W. Mark Crain for the Small Business Administration Office of Advocacy, September 2005	Estimates of expenditures and other costs for companies to comply with federal environmental regulations.
Economic	*OMB Report to Congress on the Costs and Benefits of Federal Regulations* for years 1997 to 2005	Estimates of direct expenditures for companies to comply with federal economic regulations issued between 1996 and 2004.
	U.S. Department of Agriculture *Federal Register* notices for the following final rules: Control of Listeria monocytogenes in Ready-to-Eat Meat and Poultry Products; National Organic Program; Retained Water in Raw Meat and Poultry Products, Poultry Chilling Requirements; Irradiation of Meat Food Products; Pathogen Reduction, Hazard Analysis and Critical Control Point (HACCP) Systems	Estimates of direct expenditures for companies to comply with federal meat and poultry safety regulations issued between 1996 and 2004.

Functional Area	Primary Source Document(s)	Used by JLARC Staff As Starting Point For ...
	U.S. Food and Drug Administration (FDA) *Federal Register* notices for the following final rules: Food Labeling, Nutrition Labeling, Small Business Exemption; Medical Devices, Current Good Manufacturing Practice (CGMP); Restriction on the Sale and Distribution of Cigarettes and Smokeless Tobacco; Bar Code Label Requirements for Human Drug Products and Biological Products; Final Rule Declaring Dietary Supplements Containing Ephedrine Alkaloids Adulterated Because They Present an Unreasonable Risk; Patent Submission and Listing Requirements and Application of 30-Month Stays on Approval of Abbreviated New Drug Applications; Procedures for the Safe and Sanitary Processing and Importing of Juice; Labeling of Shell Eggs; Trans Fat Labeling; Safety and Effectiveness of New Drugs in Pediatric Patients; Over-the-Counter Human Drug Labeling Requirements; Substances Prohibited from Use in Animal Food or Feed	Estimates of direct expenditures for companies to comply with federal FDA regulations issued between 1996 and 2004.
	National Highway and Traffic Safety Administration (NHTSA) Federal Register notices for the following final rules: Federal Motor Vehicle Safety Standards, Tire Pressure Monitoring Systems, Controls and Displays; Light Truck Average Fuel Economy Standards Model Years 2005 – 2007; Federal Motor Vehicle Safety Standards, Occupant Crash Protection; and Federal Motor Vehicle Standards, Child Restraint Systems, Child Anchorage Systems	Estimates of expenditures for companies to comply with federal motor vehicle safety standards issued between 1996 and 2004.
	The Impact of Regulatory Costs on Small Firms, by W. Mark Crain for the Small Business Administration Office of Advocacy, September 2005	Estimates of expenditures and all other costs for companies to comply with federal economic regulations.
Workplace	*A Review and Synthesis of the Cost of Workplace Regulations*, a Mercatus Center Working Paper by Joseph M. Johnson, August 30, 2001	Estimates of expenditures and other costs for companies to comply with the following types of workplace statutes and regulations: employee benefits, civil rights, labor-management relations, employment decision laws, and certain OSHA regulations.

Functional Area	Primary Source Document(s)	Used by JLARC Staff As Starting Point For ...
	Federal Register notices for the following regulations: Control of Hazardous Energy Sources (Lockout/Tagout) and Hazard Communication	Estimates of the expenditures for companies to comply with OSHA's Lockout/Tagout and Hazard Communication regulations
	OSHA Preambles to Final Rules for the following regulations: Air Contaminants; Occupational Exposure to Asbestos; Occupational Exposure to Bloodborne Pathogens; Occupational Exposure to Cadmium; Occupational Exposure to Formaldehyde; Occupational Exposure to 4,4' Methylenedianiline (MDA); Occupational Exposure to Methylene Chloride; Personal Protective Equipment for General Industry; Powered Industrialized Truck Operator Training; Occupational Exposure to 1,3-Butadiene; Respiratory Protection	Estimates of the expenditures for companies to comply with certain OSHA regulations.
	Occupational Exposure to Cotton Dust: Notice of the Availability of a Lookback Review Pursuant to the Regulatory Flexibility Act and Executive Order 12866	Estimates of the expenditures for companies to comply with OSHA's Cotton Dust regulation
	OSHA Regulatory Impact Analyses for the Grain Handling Facilities regulation	Estimates of the expenditures for companies to comply with OSHA's Grain Handling Facilities regulation.
Tax	*The Rising Cost of Complying with the Federal Income Tax*, Tax Foundation, December 2005	Estimates of the hours necessary to complete different federal tax forms.
	Measuring the Tax Compliance Burden of Small Businesses, IBM Business Consulting Services and Internal Revenue Service, 2005.	Estimates of the hours necessary to file federal taxes for different sizes of companies.
	Does Disconformity in State Corporate Income Tax Systems Affect Compliance Cost Burdens?, Sanjay Gupta and Lillian F. Mills, June 2003.	Estimates of compliance costs for state corporate income taxes.

Source: JLARC staff.

A complete list of the source documents used for the existing estimates can be found in the bibliography (Appendix E).

Inflate the Expenditures Estimates into 2005 Dollars as Needed

Few of the source estimates used for this report represented 2005 compliance costs. Consequently, JLARC staff primarily used the Consumer Price Index as calculated by the U.S. Census Bureau to inflate compliance cost estimates as necessary into 2005 dollars.

However, JLARC staff used more targeted or specific data to inflate cost estimates into 2005 dollars when it was available (Table 2).

Table 2: Data Other Than Consumer Price Index Used to Inflate Cost Estimates into 2005 Dollars

Functional Area	Dataset Used to Inflate Estimate into 2005 Dollars	How Data Used to Inflate Cost Estimate
Environmental	Capital Expenditures, Manufacturing, *Annual Survey of Manufacturers*, U.S. Census Bureau, 1999 to 2004.	Capital expenditures purchased yearly between 1999 and 2004 was used to inflate the 1999 capital expenditure estimate from the Pollution Abatement Capital Expenditures survey.
Workplace	*Employer Cost for Employee Compensation Index*, Bureau of Labor Statistics, various years.	Total compensation costs (salaries / wages and benefits) from various years was used to inflate administrative / staffing expenditures from various existing cost estimates. Base years used were 1986, 1989, 1992, 1994, and 1998, depending on the year of the original cost estimate.
	Producer Price Index; Commodities (Item: Capital Equipment), Bureau of Labor Statistics, various years.	Capital equipment costs were used to inflate capital equipment estimates from various existing cost estimates. Base years used were 1988, 1992, and 1994, depending on the year of the original estimate.

Source: JLARC staff.

Apportion the Estimate to Manufacturing Sub-Sector-Specific and Virginia-Specific Estimates, as Necessary

Some of the above existing estimates were for the national economy as a whole. In these instances, JLARC staff used the percentage of national employment attributable to manufacturing to derive a national estimate applicable only to manufacturing. According to the U.S. Bureau of Labor Statistics (BLS), an estimated 112,433,000 people were employed nationwide. Of these, 14,218,102 were employed by manufacturers. This represented approximately 12.6 percent of national employment, and this ratio was applied to any national estimates as necessary.

This ratio was then used as the starting point to derive an estimate specifically for Virginia. In 2005, of the estimated 14,218,102 people employed nationwide in the manufacturing sector, 295,697 were in Virginia. This represented just over two percent of national manufacturing employment, and this ratio was applied to any national manufacturing estimates as necessary. Where existing estimates were segmented by business sector, the above calculation was not necessary.

CONDUCTING CASE STUDIES WITH SELECTED VIRGINIA MANUFACTURERS

To provide more insight into the JLARC-adjusted existing estimates, staff conducted case studies with selected Virginia manufacturers. JLARC staff worked with the VMA to identify companies willing to work with JLARC to determine their facility's compliance costs. Five large companies with facilities in Virginia were willing to participate. The primary function of these facilities was paper manufacturing (two facilities), computer and electronic product manufacturing, transportation equipment manufacturing, and beverage and tobacco products.

JLARC staff provided each of the five companies with case study workbooks to be issued to company staff to determine their compliance costs for each regulatory function. Eight workbooks were provided to each company, two in each functional area:

- Background Information and Questionnaire for Case Study Companies: Allowed companies to identify their facility's cost estimate compared to the JLARC-adjusted existing cost estimate. Asked companies to identify the costs that would be incurred if the regulations did not exist, the return on investment that the company receives as a result of the regulatory action, the benefits of regulations, the Virginia regulations that could be improved, and why.
- Supplemental Worksheets: Asked facilities to identify costs and regulations at a more detailed level. For example, facilities were asked to provide historical cost estimates and divide out costs by capital expenditures and operating costs.

JLARC staff received 16 workbooks with information from five companies. These workbooks and the information they contain were provided to JLARC staff in confidence as proprietary information. Consistent with JLARC recordkeeping policies, these workbooks have been destroyed after the final analysis. Sample background and supplemental worksheets are available in the Technical Appendix.

SURVEYING VIRGINIA MANUFACTURING COMPANIES

To interact with more companies than was feasible through the time-intensive case studies, JLARC staff also developed a survey that was available to all manufacturers in Virginia. JLARC staff again worked with VMA and its membership to develop and pretest the survey. The survey included ten questions covering compliance costs, suggested improvements to Virginia's regulatory framework, and other information about companies' corporate de-

cision making. This survey was available online from early June to mid-August 2006.

JLARC staff and VMA conducted the following activities to publicize the survey and encourage manufacturers to participate:

- VMA sent e-mail notification to approximately 650 of its member manufacturing companies;
- JLARC staff mailed additional hard-copy notification fliers to more than 2,200 Virginia manufacturing companies;
- Information about the survey was published in the *Richmond Times-Dispatch* and at www.richmond.com; and
- VMA and JLARC staff made announcements at VMA meetings, and VMA targeted larger manufacturing companies with follow-up phone calls.

Sixty-three Virginia manufacturers completed questions on the survey. This number represents approximately 2.5 percent of companies notified and 1.2 percent of the total manufacturing companies in Virginia. The 63 companies employ more than 49,000 people in Virginia, which represents nearly 17 percent of the State's total manufacturing employment. Responses were received from all regions of the State and from all manufacturing sub-sectors except textile mills, leather, wood, petroleum and coal, primary metal, and furniture.

A sample copy of the survey is available for reference in the Technical Appendix.

COLLECTING REGULATORY INFORMATION FROM OTHER STATES

To better understand how Virginia's regulatory framework compares to other states, JLARC staff worked with Virginia executive branch agencies to identify knowledgeable officials in relevant state agencies in other states. JLARC selected Georgia, Maryland, North Carolina, Pennsylvania, and Tennessee for comparison to Virginia. Staff chose these states because the study mandate requires a comparison to mid-Atlantic and southern states, and these states, according to the Virginia Economic Development Partnership, are among those that Virginia typically competes with when recruiting manufacturing companies.

JLARC staff worked with Virginia executive branch agencies to develop a worksheet that was completed for Virginia. A worksheet was then sent to the representatives in other states. The worksheet asked the other states to identify the regulations in their

state that directly impact manufacturers and to estimate the impact the regulation had on manufacturing. Where necessary, JLARC staff also conducted independent research and interviewed other state agencies to clarify and corroborate information from these worksheets. All of the executive branch agencies in these other states provided information for the review.

INTERVIEWING OTHER ORGANIZATIONS

JLARC staff conducted additional interviews with representatives from the following organizations to gain a broader perspective on Virginia's regulatory framework than just manufacturers' compliance costs. These interviews focused on Virginia's regulatory framework, methodological considerations for conducting regulatory impact analysis, and the purpose and benefits of the regulations.

- Weldon Cooper Center, University of Virginia
- Virginia Economic Development Partnership
- Virginia Chamber of Commerce
- U.S. Small Business Administration
- Chesapeake Bay Foundation
- Environmental Protection Agency, Region 3
- Sierra Club, Virginia Branch
- The American Lung Association of Virginia
- The Nature Conservancy, Virginia Branch
- Virginia Conservation Network
- Wetlands Watch
- Virginia Municipal League
- Virginia Association of Counties
- Various local Commissioners of Revenue

Appendix C

Virginia's Environmental Regulations

Virginia Regulations Adopted by Reference from Federal Regulations

Type	Federal Citation	Virginia Citation	Title in Virginia Administrative Code
Air Quality	40 CFR, Parts 51 and 60	9 VAC 5-40	Existing Stationary Sources
	40 CFR, Parts 51 and 60	9 VAC 5-50	New and Modified Stationary Sources
	40 CFR, Parts 61 and 63	9 VAC 5-60	Hazardous Air Pollutant Sources
	40 CFR, Part 51	9 VAC 5-70	Air Pollution Episode Prevention
	40 CFR, Parts 51, 60, 61, 63, 70 and 72	9 VAC 5-80	Permits for Stationary Sources
	40 CFR, Part 51	9 VAC 5-140	Regulation for Emissions Trading
Water Quality	40 CFR, Parts 122, 123, 124, 403 and 503	9 VAC 25-31	Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation
	None listed in Town Hall	9 VAC 25-40	Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed
	40 CFR, Parts 122, 123 and 124	9 VAC 25-110	Virginia Pollutant Discharge Elimination System General Permit for Sewage Discharges Less Than or Equal to 1,000 Gallons Per Day
	40 CFR, Parts 122, 123 and 124	9 VAC 25-151	Virginia Pollutant Discharge Elimination System (VPDES) General Permit Regulation for Storm Water Discharges Associated with Industrial Activity
	40 CFR, Parts 122, 123 and 124	9 VAC 25-190	Virginia Pollutant Discharge Elimination System (VPDES) General Permit Regulation for Nonmetallic Mineral Mining
	40 CFR, Parts 122, 123 and 124	9 VAC 25-193	General Virginia Pollutant Discharge Elimination System Permit for Concrete Products Facilities
	40 CFR, Parts 122, 123 and 124	9 VAC 25-196	General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Cooling Water Discharges
	40 CFR, Part 131	9 VAC 25-260	Water Quality Standards
	40 CFR, Parts 280 and 281	9 VAC 25-580	Underground Storage Tanks: Technical Standards and Corrective Action Requirements
	None listed in Town Hall	9 VAC 25-660	Virginia Water Protection General Permit for Impacts Less Than One-Half Acre
	None listed in Town Hall	9 VAC 25-720	Water Quality Management Planning Regulation

Waste Management	40 CFR, Part 258	9 VAC 20-70	Financial Assurance Regulations for Solid Waste Facilities
	49 CFR Parts 107, 170-180, 383 and 390-397	9 VAC 20-110	Regulations Governing the Transportation of Hazardous Materials
	40 CFR, Parts 255 and 256	9 VAC 20-130	Regulations for the Development of Solid Waste Management Plans

Virginia Regulations that Supplement Federal Regulations

Type	Virginia Citation	Title
Air Quality	9 VAC 5-510	Nonmetallic Mineral Processing General Permit
Water Quality	9 VAC 25-210	Virginia Water Protection Permit Regulation
	9 VAC 25-380	Wetlands Policy
	9 VAC 25-401	Sewage Treatment in the Dulles Area Watershed
	9 VAC 25-410	Occoquan Policy
	9 VAC 25-415	Policy for the Potomac River Embayments
	9 VAC 25-790	Sewage Collection and Treatment Regulations
Waste Management	9 VAC 20-60	Hazardous Waste Regulations
	9 VAC 20-80	Solid Waste Management Regulations

Virginia Regulations that Stand Alone From Federal Regulations

Type	Virginia Citation	Title	Reason for Adoption
Water Quality	9 VAC 25-20	Fees for Permits and Certificates	Adopted in response to a State mandate to recover part of the costs of the Water programs from those requesting permits.
	9 VAC 25-91	Facility and Aboveground Storage Tank (AST) Regulation	Establishes pollution prevention operating requirements to minimize the potential for catastrophic spills from petroleum aboveground storage tanks. Also implements facility plans to protect human health and minimize environmental impact from actual catastrophic petroleum spills. Established in accordance with State law.
	9 VAC 25-280	Ground Water Standards	Adopted in response to State mandate to protect all State waters above and below ground.
	9 VAC 25-390	Water Resources Policy	Adopted to establish precepts for water resource protection.
	9 VAC 25-600	Eastern Virginia Ground Water Management Area	Adopted in response to a need to protect the quantity of ground water.
	9 VAC 25-610	Ground Water Withdrawal Regulations	Adopted in response to a need to protect the quantity of ground water.
	9 VAC 25-620	Order Declaring the Eastern Shore of Virginia - Accomack and Northampton Counties - as a Critical Ground Water Area	Adopted in response to a need to protect the quantity of ground water.

Waste Management	9 VAC 15-30	Regulations for the Certification of Recycling Machinery and Equipment for Local Tax Exemption Purposes (formerly 9 VAC 20-140)	Adopted to promote recycling by providing a tax credit for certain purchases.
	9 VAC 20-90	Solid Waste Management Permit Action Fees	Adopted to recover part of the costs of the program from those requesting permits.
	9 VAC 20-160	Voluntary Remediation Regulations	Adopted to provide a voluntary program for owners to clean up various properties not regulated by other environmental laws.

Source: Virginia Regulatory Town Hall and Virginia Department of Environmental Quality.

Appendix D

Environmental Regulations Identified by Virginia Manufacturers for Improvement

Manufacturers identified regulations that could be improved through case studies and survey responses. In six instances, a regulatory citation and a specific concern for Virginia-initiated regulations were included in the statement. In these cases, JLARC staff were able to obtain a response to the concern from the Virginia Department of Environmental Quality (DEQ). Virginia regulations cited as a concern and DEQ's response are shown in the table below.

Identified Regulation	Manufacturer's Concern	DEQ Response
Virginia Water Protection Permit (9 VAC 25-210)	• Compliance costs are too high • Basis for regulation unclear or not built on science or proven facts • Limits company's competitive advantage	• Wetlands provide important waste assimilation, stormwater assimilation, and habitat. The identification and characterization of wetlands is based upon well-established scientific criteria that are used by the federal agencies as well as DEQ. • The General Assembly decided to create this permit program, expanding on the water quality certification program of the Clean Water Act, to protect all wetlands in the Commonwealth and establish a goal of no-net loss of wetlands. • Regarding the compliance costs, it is important to note that Virginia's permit would not, for those projects that need a federal permit, increase compliance costs as the permit conditions would generally be the same. • The department is currently meeting with stakeholders to discuss ideas for program improvements.
Ground Water Standards (9 VAC 25-280)	• Basis for regulation unclear or not built on science or proven facts	• Ground water serves as the sole source of water supply for residential uses in large portions of the Commonwealth. In addition to private residential uses, ground water supplies many public water supplies (in whole or in part) and commercial, industrial and agricultural uses. The ground water standards were developed to prevent pollution of ground water; protect public welfare, safety and health; and assure that ground water can be relied upon as a untreated source of drinking water now and into the future.

Identified Regulation	Manufacturer's Concern	DEQ Response
Numerical limits on tributyltin (TBT) in the Virginia Pollutant Discharge Elimination System (VPDES) General Permit Regulation for Storm Water Discharges Associated with Industrial Activity (9 VAC 25-151.250)	• The strict numerical limits on TBT results in lost investment opportunities	• Virginia's large shipbuilding industry and Naval and marine presence are unique compared to other states in the region. TBT is most commonly found in marine paint and is extremely toxic, causing mutation in aquatic life. Virginia adopted numerical limits on TBT to prevent those adverse impacts. • There are no numerical TBT limits or specific TBT requirements in the Storm Water General Permit for Industrial Activities. Storm water discharges are not process discharges, but runoff discharges. • Discharges of TBT would be part of a process wastewater discharge and TBT limits are included in individual permits issued to shipyards. The limits are developed based on the Virginia Water Quality Criteria and a TBT Strategy developed and implemented in conjunction with, and agreed to by, representatives from the Virginia Shipbuilding and Repair Industry and the Chesapeake Bay Foundation. The TBT limits and the conditions included in individual permits have not changed since the TBT Strategy Agreement was signed in 2002.
Solid Waste Management (9 VAC 20-80)	• Requirements are unnecessarily rigid	• Provides improved solid waste management practices and program procedures. Concerns over requirements of the solid waste management regulations have been expressed previously to the department as part of the permit efficiency review. The department is actively working to address these concerns and will be focusing on results-based regulatory requirements in future amendments of the regulation.

Identified Regulation	Manufacturer's Concern	DEQ Response
Fees for Permits and Certificates (9 VAC 25-20)	• Imposes unnecessary costs on manufacturers by going beyond minimum oil pollution control activities	• The permit fees were established by the General Assembly to shift part of the costs of implementing the permitting programs from the citizens of the Commonwealth to the regulated facilities. The fee structure for each program was developed with the businesses and local governments impacted by that program. • The fee regulations also provide for reduced fees for facilities that have maintained a strong compliance record and have demonstrated a commitment to environmental protection by participating in the Virginia Environmental Excellence Program. • In 2005, DEQ collected $17 million in permit fees for the air, water and waste permit programs, nearly $10 million of which was for the air permit program. The air permit program fees are set at the minimum level allowed by federal law. Based on analysis done when the fee schedules were negotiated, water permit fees appear to be comparable to those collected by other states. • The department submits biennial reports to the General Assembly that include information on program costs, fees collected and fees charged by other states.
Facility and Aboveground Storage Tank (AST) Regulation (9 VAC 25-91)	• Is redundant with Spill Prevention, Control, and Countermeasure Plans and Facility Response Plans (40 CFR 112) • Inspection requirements are too frequent and documentation is too burdensome • Normal systems management activities are effective in preventing releases from storage tanks	• The adoption of the facility and aboveground storage tank regulations were mandated by the General Assembly to protect the Commonwealth's waters, lands or storm drains from spills and releases of oil from aboveground storage tanks/facilities. At the time the regulations were initially adopted, similar federal requirements were either nonexistent or inadequate for implementing the program directed by the General Assembly. The regulations have been modified over the years to allow for compliance with federal requirements.

Source: JLARC staff analysis of case studies, survey, and DEQ responses.

Appendix E

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Appendix F

Agency Responses

As a part of an extensive validation process, State agencies and other entities involved in a JLARC assessment effort are given the opportunity to comment on an exposure draft of the report. Appropriate technical corrections resulting from comments provided by these entities have been made in this version of the report. This appendix includes written responses from the Virginia Manufacturers Association, and Departments of Planning and Budget, Environmental Quality, Labor and Industry, and Taxation.

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September 28, 2006

Mr. Philip Leone, Director
Joint Legislative Audit and Review Commission
Suite 1100, General Assembly Building, Capital Square
Richmond, Virginia 23219

Dear Mr. Leone:

On behalf of the Virginia Manufacturers Association, I would like to thank you and your staff for the phenomenal effort that went into completing the JLARC cost of regulatory compliance study for the manufacturing sector (SJ360). The report represents an excellent foundation by which to assess the cost of regulatory compliance by our sector. The study will also provide the legislature with insight into the hard costs directly associated with legislation and regulation. The report uses concise summaries and graphics that will help the reader to easily evaluate the report's content. We found the information in the report to be detailed and reflective of the experience of the manufacturing sector in Virginia.

Your representative, Mr. Justin Brown, led his team with the utmost integrity and at all times was sensitive to the issues of time and confidentiality expressed by the survey respondents and participants. Anyone reading this report must appreciate the incredible research and analytical skill necessary to formulate this research methodology and effectively implement such a study. This is an impressive accomplishment that we think should be considered as a model for all states. Further, we think that benchmarking associated costs with legislation and regulation assists all stakeholders to better evaluate methods of achieving the expressed public outcomes of said legislation and regulation in ways that are mindful of competitive pressures on the manufacturing sector.

We are confident that the report will be a valuable resource for Virginia. You should be extremely proud of your staff and this report.

Sincerely,

Brett A. Vassey
President & CEO

COMMONWEALTH of VIRGINIA

Richard D. Brown
Director

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October 2, 2006

Mr. Philip A. Leone, Director
Joint Legislative Audit and Review Commission
Suite 1100, General Assembly Building, Capitol Square
Richmond, Virginia 23219

Dear Mr. Leone:

Thank you for the opportunity to review he exposure draft of the report, Impact of Regulations on Virginia's Manufacturing Sector. I have reviewed the report with staff at Department of Planning and Budget (DPB) and find no significant impact on DPB in the report. I base my assessment on the report's statements that "Virginia regulations largely mirror federal requirements and do not add substantial costs;" "Virginia regulations were not the primary reason for manufacturing's decline;" and, "Fostering manufacturing in Virginia requires considering factors other than Virginia regulations." The report is also very informative.

I have some suggestions which I would like to clarify DPB's role. My interest is assuring that readers of the report do not undervalue the work of DPB in the regulatory review process and understand the scope of DPB's mandate in the process.

Page 15:

- Report: "DPB has an Economic and Regulatory Analysis Division that is charged with conducting economic impact analyses on major regulations being proposed by executive branch agencies."
- Response: DPB conducts economic impact analyses on all proposed changes to all non-exempt regulations, not just major regulations.
- Suggestion: "DPB has an Economic and Regulatory Analysis Division that is charged with conducting economic impact analyses on all proposed changes to all non-exempt regulations being proposed by executive branch agencies. This includes all Secretariats except Technology."

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Page 21:

- Report: DPB indicates that this is primarily due to the inherent difficulty in making such projections..."
- Response: DPB could make such projections without too much difficulty if we were willing to make subjective assumptions. Rather than make subjective assumptions and value judgments, we make non-monetary benefits and costs clear to the reader with descriptive language concerning magnitude.
- Response: The report lists costs and benefits from federal regulations without stating how these benefits were estimated. Monetizing non-monetary costs and benefits is inherently subjective and includes value judgments. It would be useful for the reader to have some information concerning the assumptions and value judgments made to calculate the federal estimates.
- Suggestion: Replace "difficulty" with "subjectivity."

Page 21:

- Report: "Instead, DPB's impact analyses often focus on which groups in Virginia may be impacted by Virginia regulations and discuss the different types of impact."
- Response: Most economic impact analyses have some level of cost estimates. Given available information, DPB estimates whether the proposed amendments to the regulation produce a net benefit, net cost, or neither.
- Suggestion: Add to the statement, "However, most economic impact analyses typically include some level of cost estimates."

Page 50:

- Report: "Neither DPB nor the agencies responsible for these regulations quantify the total costs to manufacturers of complying with these regulations."
- Response: DPB's economic impact analyses estimate the costs to manufacturers (and others) of *proposed changes* to regulations. Except potentially as a special project, it is not DPB's function to estimate the impact of regulations that are not under proposal to change.
- Suggestion: Add a footnote or statement that "DPB's mandate is to estimate the costs of proposed changes and not the total cost of existing regulations."

Note also that Executive Order 36 (2006) was signed by Governor Kaine today and reference in the report should reflect it rather than Executive Order 21 (2002). Staff at DPB also noted general comments on the analysis itself which they would be happy to discuss in more detail since I am limiting my response to only those suggestions that pertain to DPB itself. For example, one of our economists raised the question of whether the government grants provided to manufacturers and the state for regulatory compliance have been subtracted from the cost estimates represented as a benefit. Another economist had ideas of expanding the analysis to more of the occupational safety regulations. If you or your staff wish to discuss any such topics further, please let me or Melanie West (804) 786-8812, the new Associate Director for the division, know.

Thank you again for the opportunity to review the draft and make our suggestions.

Sincerely,

Richard D. Brown

c The Honorable Jody M. Wagner
Secretary of Finance
Justin Brown
Melanie K. West

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OCT - 2 2006

September 29, 2006

Mr. Philip A. Leone, Director
Joint Legislative Audit and Review Commission
Suite 1100, General Assembly Building
Capitol Square
Richmond, Virginia 23219

RE: Impact of Regulations on Virginia's Manufacturing Sector

Dear Mr. Leone:

Thank you for providing a copy of the JLARC Exposure Draft of *Impact of Regulations on Virginia's Manufacturing Sector*. It can be difficult to quantify the costs of compliance with environmental regulations as well as the costs of the failure to control pollution and I appreciate your efforts to undertake such a complex analysis.

The Department of Environmental Quality (DEQ) is working to improve the efficiency of our environmental protection programs and reduce the costs of regulatory compliance. As part of a recent review of our solid waste program, we developed guiding principles that are being applied to all of our programs. These principles recognize that the best way to accomplish our mission of protecting Virginia's air, water, land and public health is through: (1) consideration of the environmental benefits and the impacts to those we regulate and the communities where they are located; (2) development and application of streamlined regulations and guidance that focus on environmental results; (3) prioritizing our efforts and resources based on potential impact to the environment; and (4) taking responsibility to identify alternatives and find solutions for any problems that arise. Application of these principles will help us to minimize the burdens we place on Virginia's manufacturing sector by focusing efforts on what's necessary to protect Virginia's air, water and land.

Chapter 2 of the Exposure Draft contains specific recommendations regarding regulations for review, the timeliness of permit issuance, and opportunities to encourage pollution reduction. The following includes some additional information for the Commission to consider and DEQ's response to the recommendations.

The Virginia Environmental Excellence Program: The Exposure Draft correctly acknowledges the efforts of Virginia's businesses to improve their environmental performance. As illustrated by the winners of the Governor's Environmental Excellence Awards, not only can these efforts result in significantly reduced environmental impacts, but also reduced environmental compliance costs. The Governor's Environmental Excellence Awards are only a part of Virginia's programs to recognize and encourage

environmental innovations. The Virginia Environmental Excellence Program (VEEP), which was initiated by DEQ in 2000 and codified by the General Assembly in 2005, is a voluntary program that recognizes facilities of all types that have shown a commitment to enhanced environmental performance and encourages innovations in environmental protection.

Highlights from manufacturing facilities participating in this program include: a reduction in solid hazardous waste production by 33% in three years; a decrease of 35.8 million gallons of water through recycling and reduced use; a reduction in annual energy use by 3%; a decrease of over 3,400 pounds of toxic air emissions; a reduction in water use by more than 1 billion gallons in three years; a reduction in the quantity of waste rags by 24% (3.5 tons); and, a reduction of water use by 6.5 million gallons in 2005. Participants have also reported significant cost savings.

There are currently 380 individual facilities participating in the program, 62 of which are from the manufacturing sector. DEQ provides positive publicity, program flexibility and the potential for approval of alternate compliance methods as variances from regulatory standards. DEQ is working with an advisory committee and program leaders to increase participation.

Facilitation of Pollution Reduction Projects: As exemplified by the Virginia Environmental Excellence Program, DEQ is actively encouraging implementation of pollution reduction projects. The Exposure Draft uses a landfill gas utilization project as an example of when environmental regulations served as a barrier to environmental improvements. The Department of Environmental Quality has successfully permitted a number of landfill gas utilization projects, including a large manufacturing project involving one of the largest landfill gas pipelines in the country. The agency is aware of only one project that did not move forward, and it actually received all the authorizations needed from DEQ. Unfortunately, its progress was impaired by several site specific factors, changes in federal regulations and a change in ownership of the pipeline company. There are a number of additional landfill gas utilization projects under development and DEQ is interested in facilitating their development; the example cited in the Exposure Draft should be considered an anomaly.

Development of Pollution Control Technology: The Exposure Draft recommends recreation of the Office of Innovative Technology within the Department of Environmental Quality. This program was entirely supported by general funds and was eliminated in 2002 as part of DEQ's budget reduction efforts. DEQ placed a priority on retaining programs needed to meet state and federal mandates, maintenance of essential environmental protection efforts, and efficiency in operations. EPA sponsors several Environmental Technology Research and Development programs that fund development of new technologies and offer information to potential users of the technology. In Virginia there are a variety of agencies and other organizations (such as the Center of Innovative Technology and the Small Business Development Centers) that provide various types of support for Research and Development, technology commercialization and business development. DEQ would be happy to work with the Manufacturing Development Commission to further evaluate the need for this service at the state level.

Permit Processing Times: The Exposure Draft reports concerns over the permit processing times and uses the increase in permit processing time for Virginia Pollutant Discharge Elimination System (VPDES) permits as an example. It is important to note, however, that permit processing times fluctuate from year to year, depending on the quality of the applications submitted, the number of applications DEQ is working with, the complexity of the projects and available staffing. Permit processing times for VPDES permits have fluctuated from as little as 108 days in 2003 to as long as 186 days in 2005. If you consider data for all permitting programs, it shows that DEQ is evaluating more permit applications with fewer staff and providing faster turn-around times in 2006 than it did in 1993. DEQ is committed to implementing our programs as efficiently as possible and hopes that implementation of the recommendations from our recent permit program efficiency study can further improve DEQ's timeliness.

Specific Regulations: DEQ welcomes the information on specific regulations that are perceived as being overly onerous. It is unclear, however, whether the comments provided in Appendix D represent a consensus among the manufacturing community or comments from individual participants in the survey. The Department is, however, currently working to improve two of the regulations identified, the Virginia Water Protection Permit Regulation (9VAC25-210) and the Virginia Solid Waste Management Regulation (9VAC20-80).

The Virginia Water Protection Permit Regulation governs impacts to wetlands and streams from construction projects and water withdrawals. DEQ has met with stakeholders from around the state and identified specific changes that will improve program implementation.

The Virginia Solid Waste Management Regulations govern the operation of landfills, incinerators, and other solid waste management facilities. DEQ will be developing amendments to restructure these regulations to provide more flexibility and shift their focus to environmental performance and results.

In 2004 and 2005, DEQ undertook a business process improvement evaluation of each of our permitting programs. Our goal was to identify changes that could reduce the costs to DEQ or to the regulated facilities for compliance with these regulatory programs. Permit Program Peer Review Teams, consisting of agency staff, facility representatives and environmental advocates, worked with a consultant to map each permitting process and identify opportunities. In total, 41 areas for improvement were identified with 251 specific tasks. While some of the recommendations required additional stakeholder or federal agency analysis, DEQ is committed to implementation of these recommendations and expects that both the agency and those we regulate will benefit as we move forward. DEQ welcomes further input from the manufacturing community and will work with the Commission to further evaluate any recommendations that are of interest to that body.

Thank you again for the opportunity to review the draft report.

Sincerely,

David K. Paylor

David K. Paylor

OCT - 2 2006

COMMONWEALTH of VIRGINIA

DEPARTMENT OF LABOR AND INDUSTRY

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October 2, 2006

Mr. Philip A. Leone,
Director
Joint Legislative Audit Review Commission
Suite 1100 Capitol Square
General Assembly Building,
Richmond, Virginia 23219

Dear Mr. Leone:

Thank you for providing the exposure of your draft report, Impact of Regulations on Virginia's Manufacturing Sector. Overall we believe the report is well written, balanced and accurate. However, we do have three (3) suggestions detailed below:

1. Chapter 4, page 66, the second full paragraph, after the second to last sentence, add the following example:

   "For example, the Virginia General Assembly in tailoring a judicial process through which employers could challenge citations and penalties issued by the Virginia Occupational Safety and Health Program, chose to give employers access to the local circuit court system and have the cases tried by the local Commonwealth's Attorney, rather than set up an administrative law judge and review commission system similar to the one used by federal OSHA."

2. Chapter 4, page 66, at the end of the second full paragraph add a new sentence:

   "An additional benefit of operating a state plan agreement with OSHA is that it requires Virginia to also provide coverage to the 3,962 state and local government employers and the related 216,462 non-federal public sector employees (as of the 4th quarter of 2005.) These groups are specifically not covered when federal OSHA enforces occupational safety and health directly."

3. Chapter 4, last line on page 67: change the word "no" to the words "only minimal."

   Explanation: This last sentence on the page refers to the VOSH ARM as a regulation that supplements or revises federal regulations and currently says that the

ARM "is more administrative in nature and would have **no** cost or fiscal impact." While the statement is true that the ARM is mostly administrative in nature, some of the provisions could have a cost associated with them, even if they are similar to a federal counterpart (e.g. the VOSH variance process, based in part on the Virginia Administrative Process Act (APA) and different than that of federal OSHA, is going to cost a company a certain amount of money to complete.)

OBSERVATIONS:

- Chapter 1, page 25, paragraph 2, second to last sentence: "The company noted that these safety improvements not only keep its workers safer but have helped increase employee morale – the turnover rate has declined by 52 percent – and coincided with an increase in operating efficiency."

  In addition to the details cited above, the benefits associated with safety and health compliance clearly result in lower worker's compensation costs.

- Chapter 4, page 61, paragraph one, last sentence: "Other costs include fines for safety violations and costs that apply only to federal contractors."

  OSHA/VOSH penalty costs are a result of **non-compliance** by the employer rather than a compliance cost itself.

- Chapter 4, page 65, in the third paragraph: "Paper company B said that "Department of Labor and Industry (DOLI) enforcement of certain regulations may increase the company's costs. For example, according to the company, DOLI interprets the federal Confined Space regulation in a way that requires the company to label almost all spaces as confined spaces, even spaces that are obvious confined spaces, such as manhole covers."

  The Department of Labor and Industry interprets the General Industry Confined Space regulation in the same manner as federal does on this issue.

Mr. Leone, we thank you for the opportunity to review your draft report and your interest in having our feedback. If you would like to discuss any of the issues raised in this letter, please feel free to contact us.

Sincerely,

C. Ray Davenport

C. Ray Davenport,
Commissioner

CRD:ml

COMMONWEALTH of VIRGINIA

Department of Taxation

October 2, 2006

Mr. Philip A. Leone, Director
Joint Legislative Audit and Review Commission
Suite 1100
General Assembly Building
Richmond, Virginia 23219

Dear Mr. Leone: Phil

Thank you for the opportunity to review the exposure draft of the "Impact of Regulations on Virginia's Manufacturing Sector" report. Overall, I found this to be a very thorough and well-researched report.

I do have one concern regarding the scope of the study, particularly as it relates specifically to the issue of taxation. The title implies that the subject is the regulatory climate for manufacturers. However, many, if not most, of the issues relate not to an administrative regulation or policy but to the underlying legislation. For purposes of fully examining the effect of manufacturers, this may not be a significant distinction, but it may be somewhat distorting to suggest that the state tax burden on manufacturers is the result of a choice made by an administrative agency when the majority of these choices are legislative.

Thank you again for the opportunity to review this report. If you have any questions or if I can provide additional information, please let me know.

Sincerely,

Janie E. Bowen
Tax Commissioner

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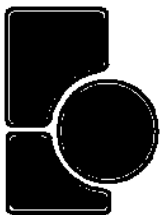

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