The Hampton Roads Economy

- Analysis and Strategies -

Part 4: Entrepreneurship in Hampton Roads

July 2005

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INTRODUCTION

Efforts to enhance regional economies have resulted in the development of a variety of economic development strategies. These strategies, when viewed historically, are commonly referred to as "waves." The first of these waves began in the 1930s and was focused on business recruitment. The second wave, begun in the 1980s, emphasized the retention and expansion of existing businesses along with the creation of new, entrepreneurial ventures. The third and final wave focused on building industry clusters, the creation of public-private partnerships, developing the skills of the work force, providing technical assistance, and developing capital networks. Today, most large communities like Hampton Roads pursue the full spectrum of these economic development activities. It is the entrepreneurial component of the second wave, i.e. the creation of new firms by entrepreneurs, that is the subject of the present document (Koven 2003).

Investigating entrepreneurship, especially at the regional level, has never been easy. In fact, because data on new business formation has been distinctly limited, efforts to understand the role of entrepreneurship in America have frequently come in the form of research on the growth and change occurring in the small business sector since information on small businesses is more readily available. However, while it may be useful to rely on statistics on small business as a proxy for entrepreneurial activity, more than a few analysts have pointed out that many small businesses are not particularly innovative or risky and therefore are not the typical entrepreneurial firm. Others have observed that, by contrast, some large businesses behave in an entrepreneurial and dynamic manner. Despite these analytical difficulties, the volume of small business growth can be regarded as a rough indicator of the level of local entrepreneurial activity. In addition, small business activity is important in its own right since small businesses make a significant contribution to all local and regional economies.

Because of the difficulty in obtaining data on entrepreneurial activity, this report will follow the convention, where necessary, of using the information on small business as a substitute for data on entrepreneurship although it is recognized that the two are different in some important ways. Fortunately, this difference diminishes when the focus shifts away from small businesses, generally to the special case of "gazelles" or small firms, which grow rapidly.

INTERNATIONAL COMPARISONS OF ENTREPRENEURIAL ACTIVITY

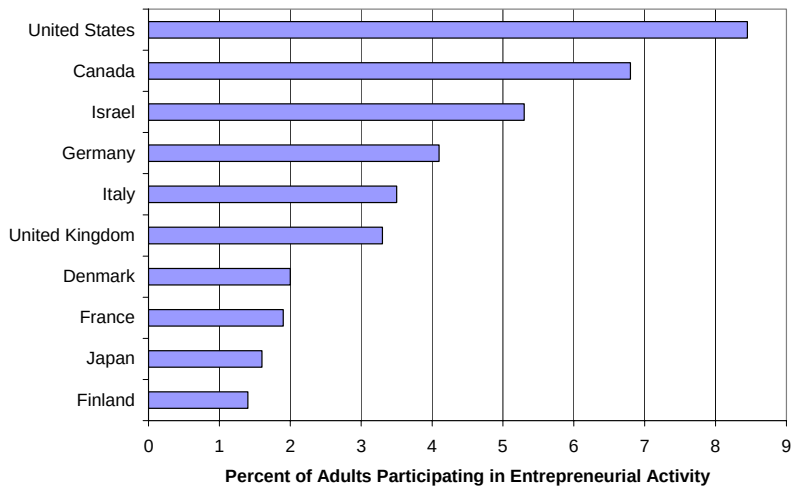
International comparisons of entrepreneurial activity have been made for some years. These efforts have generally reflected positively on the U.S. since

rates of new firm creation in America are high.[1] One highly regarded study done jointly by Babson College and the Kauffman Foundation, referred to as the Global Entrepreneurship Monitor or the GEM study, found that the U.S. exhibited the seventh highest Total Entrepreneurial Activity (TEA) rate (an indicator of entrepreneurial activity) among the 31 countries surveyed and the highest TEA rate among the G7 nations (Minniti 2004).[2,3]

Because of the nation's advantage in creating new businesses, the U.S. economy has grown more rapidly than the countries of Western Europe (OECD 1998).[4] In fact, there is evidence that the pace of entrepreneurial activity accounts for as much as one-third of the differences in entrepreneurial activity between nations (Ruble 2000). Rates of entrepreneurial activity in several developed nations are shown in Figure 1 (Bednarzik 2000).

For years, investigators, both here and abroad, have attempted to explain the rapid rate of entrepreneurial activity in the U.S. and the comparatively slow pace elsewhere. Several factors judged to be of special importance are listed below.

Figure 1: Total Entrepreneurial Activity Index



The first of these has to do with the legal structure of nations. Differences in these structures appear to make it easier for persons to start a new business in the U.S. than elsewhere in the developed world. In fact, according to work done at the World Bank, it typically takes four days in the U.S. and approximately $210 to complete 5 procedures required to establish a business as a legal entity. By contrast, in Japan it cost $3,500 and takes 31 days to complete

[1] While the rate of new firm creation in the U.S. is high, the rate of new firm survival is lower than in most other countries. Some suggest that this turbulence is a reflection of dynamism in the economy since communities with low rates of firm survival have tended to be among the most prosperous economically (OECD 1998).
[2] The Total Entrepreneurial Activity index is the percentage of the adult population either starting or managing a new business.
[3] With the addition of Russia, the G7 has become the G8.
[4] For example, between 1975 and 1998, U.S. employment grew, on average, at just under 2 percent per year as compared to only one-half of one percent in the European Union (Bednarzik 2000).

the 11 procedures that are necessary to create a new business entity. Even more time is required in other locations. For example, it takes 56 days in Belgium to establish a new business while in Spain the process requires approximately 115 days. In essence, the legal system in the U.S. regards business ownership as an inherent right while many foreign systems regard that ownership as a privilege to be granted by the government (Poole 2004).

Also important is a country's bankruptcy legislation, which influences a nation's ability to reallocate resources quickly and efficiently as business conditions change. Historically, America's bankruptcy legislation has given the bankrupt individual a "clean slate" by discharging further obligations to pay their debts.[5] This approach has made it easier and more desirable to declare bankruptcy and has reduced the risk of starting a new business. It may also help to eliminate the stigma of failure. By contrast, in many other countries, a failed entrepreneur can be pursued by creditors for years. This, no doubt, has discouraged entrepreneurs in those countries from undertaking new and risky business projects (OECD 1998).

Another factor identified as explaining differences between societies in the number of new business startups is something, which has come to be called entrepreneurial spirit (also referred to as entrepreneurial culture). This spirit has become evident through a variety of cross-national surveys designed to explore the nature of entrepreneurial activity. For example, when compared to other nations, surveys have found that Americans are more willing to start a new business than their counterparts in other developed countries. In fact, a recent study found that more than 70 percent of adult Americans would prefer working for themselves than working for someone else. By contrast, the same survey found that only 46 and 41 percent of adults in Western Europe and Japan, respectively, would prefer to be an entrepreneur. A further poll of Americans found that 90 percent would approve of their child going into business for themselves. In fact, studies have frequently found that a much higher proportion of Europeans than Americans say that the idea of starting a business has never crossed their minds. The willingness of Americans to start a new business suggests that there is a higher tolerance for risk taking in the U.S. than elsewhere (Poole 2004).

Part of the explanation for the willingness of Americans to start new firms may be that many people have had personal contact with an entrepreneur. In fact, the Global Entrepreneurship Monitor found that a higher fraction of men and women in the U.S. knew someone personally who had started a business as

[5] In April, 2005 the Bankruptcy Abuse Prevention and Consumer Protection Act was signed into law. While the impact of the legislation is yet to be determined, one of the intents of the law is to require some higher-income individuals to repay a portion of their debt. Those persons, who formerly were able to eliminate their debts by filing for a Chapter 7 bankruptcy, will now be required to use a Chapter 13 repayment plan instead. The impact of this new legislation may cause would-be entrepreneurs to reassess their plans to form a new business since their level of financial risk will be higher.

compared to those in 30 other nations.[6] These personal contacts appear to have provided many Americans with role models that have enabled them to conceive of themselves as would-be entrepreneurs (Minniti 2004).

Another aspect of the American culture that works to the nation's advantage is that most citizens attach little stigma to a business failure. Americans, it appears, do not automatically assume that a business failure is the owner's fault. As a result of this tolerant attitude toward failure, Americans are willing to make repeated attempts to start a new business as evidenced by the fact that many successful American entrepreneurs have failed one or several times over the course of their business careers (OECD 1998). [7]

Another advantage offered by the American business system is its competitive financial environment, which has resulted from limited regulation along with the rapid evolution in the methods of financing. In addition, American entrepreneurs appear to have benefited from bank deregulation that began in the 1970s along with the development of junk bond financing, which has given access to funding for firms with below average credit ratings. In addition, the venture capital industry has expanded rapidly in recent years further adding to the financing options available to startup businesses (Poole 2004).[8]

American entrepreneurs also benefit from the fact that the relationship between businesses and their employees is more loosely regulated in the U.S. – especially as compared to those in Western Europe. In fact, many have argued that the relatively rapid pace of new job formation in America stems from the fact that the U.S. does not regulate labor markets to the extent that other countries have. This is confirmed by work done at the World Bank which found that employers in the U.S. have the most flexibility in hiring and firing workers (Poole 2004). In addition, the flexibility that American companies have in setting the compensation of their employees through the use of stock options has been helpful to many young companies. This flexibility has enabled them to compete with larger firms for labor and to conserve cash in the process. By contrast, entrepreneurs in many other countries have not been allowed to use stock options for fear that the practice might encourage tax avoidance (OECD 1998).

U.S. entrepreneurs have also benefited from the protection given to them by the nation's patenting system. Without the protection of intellectual property rights, firms would be reluctant to invest in research and development since their

[6] The Global Entrepreneurship Monitor (GEM) project is a large scale long-term project developed jointly by Babson College and the London Business School. The project is sponsored by the Ewing Marion Kauffman Foundation. More than 40 countries are now members of the GEM consortium. Not all participate in each survey.

[7] One study of bankrupty in the U.S. found that one third of entrepreneurs who failed had owned another business before starting the failed business.

[8] The U.S. has the highest rate of informal (non-institutional) investment in small businesses of any other G7 (now G8) nation. In fact, during the previous three years, 5 out of every 100 adults had invested in someone else's business (Minniti 2004).

discoveries could fall into the hands of competitors destroying the value that they have created through their research. Fortunately, the cost of getting and maintaining a patent is lower for American entrepreneurs than for foreign business owners. In fact, it has been estimated that the cost to obtain a patent in the U.S. and Japan is only a third as much as the cost in Europe. Unfortunately, while the cost of obtaining a patent is less, the cost of litigating to enforce an owner's patent rights is much higher in the U.S. than in Europe (OECD 1998).

A further advantage enjoyed by the U.S. is the diverse mix of its population. Over many decades America has received a stream of migrants from around the world. Many have come to improve the quality of their lives and have worked hard. Of these, some have started new businesses that have met the demands of other migrants. Others have started companies to meet the needs of the foreign countries from which they have come. The presence of a large number of foreign-born residents has, no doubt, contributed to the dynamism of the American economy.

American entrepreneurs have also benefited from the nation's low tax burden. The World Bank contends that the U.S. tax burden (measured by total tax revenue as a percent of GDP) is lower than the burden in any other developed nation with the exception of Japan. National tax burdens are shown in Table 1. Furthermore, because of carry-forward and backward of losses, it has been estimated that some 40 percent of companies have no taxable profits. While taxes are necessary to finance public services and infrastructure, high taxes tend to suppress economic activity by discouraging initiative. High marginal income and corporate tax rates penalize successful entrepreneurs. Aware of the negative impact of high taxes on the rate of new business formation, many countries of the developed world have dropped their marginal personal income tax and corporate tax rates in recent years (OECD 1998).[9]

Table 1: World Tax Burdens
2000

	Total Tax Revenue as a Percent of GDP
Sweden	54.2
Denmark	48.8
Belgium	45.6
France	45.3
Italy	42.0
Netherlands	41.4
Norway	40.3
Germany	37.9
Greece	37.8
United Kingdom	37.4
Canada	35.8
Switzerland	35.7
Spain	35.2
New Zealand	35.1
Portugal	34.5
Australia	31.5
Ireland	31.1
United States	29.6
Japan	27.1

Source: Organization for Economic Cooperation and Development

[9] The inheritance tax may also diminish entrepreneurial activity by making it costly to transfer company ownership (OECD 1998).

The structure of government is another favorable aspect of the American business system. Some observers have speculated that America's federal system serves the nation well since state and local governments are required to provide the majority of public services. This has tended to hold down the cost of providing public services since states and localities compete to provide services in an effective manner while working hard to minimize their tax burden. Failure in this competition can have important and negative consequences for state and local economies (Poole 2004).

Each of these factors helps to explain America's high standing among the nations of the world in entrepreneurial activity. Given the importance of entrepreneurship to the nation's economy, America needs to continue its efforts to create an environment which is conducive to the formation of new business enterprises – especially those that are devoted to developing high tech, innovative products and services.

THE ROLE OF ENTREPRENEURSHIP AND SMALL BUSINESS IN THE ECONOMY

The Entrepreneur

Unfortunately for those wishing to study entrepreneurship, there is little agreement as to what an entrepreneur is and what constitutes an entrepreneurial event (Kent 1984). In general, entrepreneurs are a subset of all business owners since they constitute a small fraction of the owners of large businesses and a much larger proportion of the owners of small businesses.[10,11]

Describing what an entrepreneur is has never been easy. Most commonly, they are described as people who assemble the resources needed to begin a new business or extend the activities of an existing business in new directions. They frequently head rapidly growing concerns that are seizing emerging business opportunities. They are seen as different from the owners of other businesses whose principal objective is to provide employment for themselves and their families in contrast to maximizing the growth of their companies.[12] Entrepreneurs are perhaps best thought of as risk-takers who take

[10] Some prefer to regard entrepreneurs as business leaders as opposed to owners since not all entrepreneurs own the businesses that they manage.

[11] The list of entrepreneurs who have started small businesses which grew to become large is impressive. The list includes, among others, Fred Smith, founder of Federal Express; Sam Walton, founder of Walmart; Arthur Blank and Bernie Marcus, founders of Home Depot; Jeff Bezos, creator of Amazon along with Bill Gates of Microsoft fame and Warren Buffet, part-owner of Berkshire Hathaway.

[12] Small businesses are frequently categorized into one of two broad classes. The first are "lifestyle" companies which include small consulting firms, local restaurants, laundromats, barber shops, etc. that were formed and are operated to provide their owner(s) with a steady income and the ability to lead their lives much as they choose. These owners typically do not expand their operations more than is required to sustain the lifestyle which they desire. By contrast, other small firms are entrepreneurial since their owner(s) work hard to rapidly expand their operations

an innovative approach to solving business problems or meeting consumer demand.[13]

The Early View

Entrepreneurs have been called the lifeblood of the American economy since large firms, which dominate the existing business landscape, have frequently played only a limited role in shaping the future. Instead, it has often been new, small firms which have determined the future growth of the nation's economy through their development and use of new technologies and the pursuit of emerging markets.

Entrepreneurial firms contribute to the future development of the economy in a number of ways. Chief among these are (1) the development of innovative products and services, (2) the creation of new firms and industries, (3) the creation of employment opportunities, and (4) the creation of wealth. It is the creation of jobs that has received the most attention by the research community.

Research into the role of entrepreneurship and its close cousin, small business, has typically found that both make an important contribution to the nation's economic health. This has led to an assortment of efforts to promote both activities. Much of the early enthusiasm for nurturing the development of the small business sector came from studies done by David Birch and his associates. He was perhaps more responsible than any other person for promoting the notion that jobs and economic development depend heavily on the growth of small businesses. Birch, who was originally a research associate at Harvard University and later with MIT, was the first to mine the information contained in the credit reports of American businesses found in the databases of the Dun and Bradstreet Corporation. One of his early studies, done in 1979, concluded that businesses with fewer than five hundred employees (the majority of business firms in the nation) generated 87 percent of the jobs in the private sector with the majority of new jobs created by companies with less than 20 employees. Furthermore, he concluded that 66 percent of all new jobs that were created in the sixties and early seventies came from small firms that were less than five years old. In a refinement to his earlier work, Birch concluded in 1981 that while the majority of jobs were being created by small businesses, most were actually being generated by a limited number of firms in only a few industries. Still later in 1987, after more study, he concluded that 88 percent of all net jobs created from 1980 to 1985 could be attributed to the activities of

in an effort to reap greater financial rewards. Frequently, they create their businesses in areas of the economy which are very dynamic and where opportunities to expand are plentiful.

[13] Sometimes entrepreneurs are simply thought of as persons undertaking the creation of a new commercial venture. However, a more narrow definition is frequently used which views entrepreneurs as innovators who develop new products or technologies in an effort to make a profit. These entrepreneurs have been estimated to constitute between 10 and 20 percent of all small business owners (Georgellis 2000).

companies with fewer than 20 employees (Kent 1984, Harrison 1994, Birch 1987).

For many, Birch's findings were surprising and controversial. In order to provide some clarity to the issue, a White House Commission on Small Business was convened to study the topic. The Commission concluded that the nation's one thousand largest corporations generated less than one-half of one percent of all of the new jobs created in the economy between 1969 and 1976. This finding further fueled the enthusiasm for promoting the entrepreneurial and small business sectors (Kent 1984).

More recent estimates have also found the small business sector to be of great importance to the economy. For example, the Office of Advocacy within the Small Business Administration has estimated that small firms represent more than 99.7 percent of the nation's employers, employ more than half of its private sector employees, pay 44.5 percent of the nation's total payroll, employ 39 percent of its high tech workers, and produce 13 to 14 time more patents per employee than large firms. The Office also found that small firms are responsible for 60 to 80 percent of all net new jobs created annually.[14]

Academic texts have also stressed the role of small, rapidly growing firms in the economy. For example, *Entrepreneurship: Theory, Process, Practice*, a recently published college textbook on entrepreneurship, teaches that since 1980, *Fortune 500* companies have lost more than 5 million jobs while more than 34 million jobs were created by smaller firms. Further, 15 percent of the fastest-growing new firms, typically formed and driven by entrepreneurs, accounted for 94 percent of the net job creation. Less than one-third of those rapidly growing companies were involved in high technology (Kuratko 2004).

Lending further support to the view that entrepreneurs play a critical role in economic growth are several studies that have focused on the role of entrepreneurship in explaining geographical differences in economic growth. One found that states with high proportions of employment in small firms have experienced above average growth in both productivity and state income along with lower than average rates of inflation and unemployment. Another found that the difference in the employment growth rates between Europe and the United

[14] One explanation for the above average rate of growth in the small business sector is the outsourcing of functions by firms which previously were vertically integrated. Many of these firms, in response to the pressures of international competition, have found it to be to their advantage to subcontract to outside firms services which they had once performed internally. Among the services most commonly externalized have been insurance, accounting, advertising, research, management consulting, advertising, public relations, engineering/ architecture, market research, professional recruiting, computer installation and repair, law, and real estate. Most of these services are not cost efficient to duplicate in-house since they are only needed on an infrequent or unpredictable basis. The rate of growth among firms in the small business sector has been among the highest for many of the sectors which have been most heavily impacted by the outscourcing process (Stutz 2005).

States (in favor of the U.S.) were explained in part by differences in the pace of new business formation during the decade of the 1990s. A further study of close to 400 labor markets in the U.S. concluded that high business birth rates precede regional job growth. Finally, a Swedish and an American study each identified the pace of new business formation as a significant driver of regional economic growth (OECD 2004).

The Alternate View

While many continue to assert that small business is central to the health of the American economy, in recent years, the support for small business promotion has began to wane since the validity of many of the early conclusions has come under challenge and criticism.[15] As a result, the Small Business Administration, one of the primary advocates for small business, has been forced to conclude that the subject of the number and proportion of jobs generated by small, entrepreneurial firms is "more complex than suspected." Critics of the work done by Birch and others have come from such places as the Brookings Institute, the media, and Dun & Bradstreet.

Moreover, recent work done by Birch appears to "back away" from his earlier assertions that it is small business that generates the majority of new jobs created by the economy. Instead, he concluded in 1995 that most of the new jobs attributable to small firms were created by relatively few firms that start small and grow rapidly. In other words, he acknowledged that most small firms grow slowly while only a limited number expand rapidly. It was a special subset of all small businesses, referred to as gazelles, that were producing most of the nation's new jobs.[16] Later work concluded that the larger of the gazelles have been particularly impressive. For example, while the larger of the gazelles constituted only 3 percent of all such firms, they accounted for 60 percent of the growth attributable to gazelles (Birch 1995, OECD 2004).

Summary statistics from the U.S. Census on American business also shed light on the role of small business in the nation's economy. The data, contained in Table 2, shows the number of firms, establishments, employment, and annual payroll for the U.S. by firm size in both 1990 and 2000. The change in these figures from 1990 to 2000 is shown in Table 3. As can be seen in Table 3, small firms employing less than 20 employees experienced an increase in employment of 1,676,000 out of a total increase in employment of 20,596,000 or only 8.1 percent of the change in the nation's private sector employment. Furthermore, all of the nation's small firms (those employing less than 500 people)

[15] Measuring the effect of new and small firms on job creation is difficult since some believe that there are a number of statistical biases which tend to overstate the contribution of small firms to job generation (OECD 1998).

[16] Birch's figures suggested that a limited number of rapidly growing small firms created 5 million jobs during the 1990 to 1994 period as compared to the net creation of just 4.2 million jobs nationally. Another study found that of the 245,000 business startups in 1985, 75 percent of the jobs created by those firms were generated by just 735 firms, a small fraction of the total.

experienced an employment increase of 6,957,000 while large firms experienced an increase in employment of 13,639,000.[17] These comparisons suggest that small firms create fewer jobs than do large ones. However, because the Census data on employment change does not track the change in employment by firm but simply by firm size, drawing conclusions about the number of jobs created by firms of different sizes is difficult since the data on firms by size does not control for the movement of firms across size boundaries. That said, the data clearly suggest that the role of small firms in creating new jobs may have been overstated and that in some time intervals, large firms have contributed significantly to job creation. The percent change in firms, establishments, employment, and payroll from 1990 to 2000 are shown in Table 4 (U.S. Census Bureau 2003).

Table 2: Employer Data by Enterprise Size - U.S.

	All Industries - Employment Size of Enterprise							
	Total	0-4	5-9	10-19	20-99	100-499	Less than 500	More than 500
Firms (thousands)								
1990	5,074	3,021	952	563	454	70	5,060	14
2000	5,653	3,397	1,021	617	516	84	5,635	17
Establishments (thousands)								
1990	6,176	3,032	971	600	590	255	5,448	728
2000	7,070	3,406	1,035	652	674	312	6,080	990
Employment (thousands)								
1990	93,469	5,117	6,252	7,543	17,710	13,545	50,167	43,302
2000	114,065	5,593	6,709	8,286	20,277	16,260	57,124	56,941
Annual Payroll (billions)								
1990	$2,104	$117	$114	$144	$352	$279	$1,007	$1,097
2000	$3,879	$186	$174	$231	$608	$528	$1,727	$2,152

Table 3: Employer Data by Enterprise Size and Absolute Change - U.S.

	All Industries - Employment Size of Enterprise							
	Total	0-4	5-9	10-19	20-99	100-499	Less than 500	More than 500
Firms (000)								
1990 - 2000	579	376	69	54	62	14	575	3
Establishments (000)								
1990 - 2000	894	374	64	52	84	57	632	262
Employment (000s)								
1990 - 2000	20,596	476	457	743	2,567	2,715	6,957	13,639
Annual Payroll (000,000,000)								
1990 - 2000	$1,775	$69	$60	$87	$256	$249	$720	$1,055

Data on firm births also brings into question the assumed role of entrepreneurs in the economy. A comparison of the relative amounts of job creation caused by the birth of new establishments (including firms relocating to the region) along with the expansion of existing establishments is shown in Table 5.[18] The data in the table is for

[17] Several size limits are commonly used when defining "small firms." They are twenty and less, less than twenty, 500 and less, and less than 500.

[18] Establishments are a single location where business is conducted or where services or industrial operations occur. A business or an enterprise may have one or more establishments.

Virginia and covers the period from 2000 to 2001. Figures from the table show that more jobs were created due to expansions than from the birth of new establishments. In fact, over the period, nearly 303 thousand jobs were created through the expansion process as compared to slightly over 179 thousand from the birth of new establishments. Similar data for Virginia on births and expansions by selected large sectors are shown in Table 6. As can be seen in the table, job growth from expansions exceeded job growth from births in 14 of the 15 sectors covered in the table.[19]

Table 4: Employer Data by Enterprise Size and Percent Distribution of Absolute Change - U.S.

	All Industries - Employment Size of Enterprise							
	Total	0-4	5-9	10-19	20-99	100-499	Less than 500	More than 500
Firms								
1990 - 2000	100.0%	64.9%	11.9%	9.3%	10.7%	2.4%	99.3%	0.5%
Establishments								
1990 - 2000	100.0%	41.8%	7.2%	5.8%	9.4%	6.4%	70.7%	29.3%
Employment								
1990 - 2000	100.0%	2.3%	2.2%	3.6%	12.5%	13.2%	33.8%	66.2%
Annual Payroll								
1990 - 2000	100.0%	3.9%	3.4%	4.9%	14.4%	14.0%	40.6%	59.4%

In the future, measuring the role of entrepreneurs in the economy should be easier since it is now possible to track a sample of individual businesses in the economy because of a new data series created by the Census. Beginning in 1991, the Small Business Administration contracted with the Census Bureau to produce a comprehensive database on businesses by size. This data has been developed into the Longitudinal Establishment and Enterprise Microdata file. This data is the only annual federal data supplying information classified by firm size. With the data, it possible to examine the births and deaths of establishments along with expansions. Using this new data source, a recently published study found that the birth of new businesses is important to job growth in the U.S. but not as important as was earlier thought when compared to the expansion of existing firms. This finding is in line with the conclusions reached by other recently completed studies on this topic (Bednarzik 2000).[20, 21]

Table 5: Virginia Employment Change from Births and Expansions
2000 - 2001

Establisment Change	Number of Establishments	Number of Jobs
Births	17,854	179,012
Expansions	45,947	302,640

[19] It is not clear from this data where entrepreneurs are being counted. Some are in the birth category while others are in the expansion category.

[20] Tracking new business formations has always been difficult since the U.S. does not have a national system for the public registration of businesses (Acs 2005).

[21] In a telephone conversation, Dr. Joseph Johnson of the Office of Advocacy at the Small Business Administration said that small businesses have generated 60 to 80 percent of the net new jobs created each year over the last decade. He pointed out that the Office's database on small firm dynamics was the root data sources from which others have been created so that the

ENTREPRENEURIAL ACTIVITY IN HAMPTON ROADS

Studies have consistently found that the level of entrepreneurial activity varies markedly across regions. Birch found, for example, higher levels of entrepreneurship in the West and the Northeast and lower levels in the North Central region and the South. Differences in culture are generally assumed to explain a significant proportion of these variations between regions. Those areas with an environment that holds entrepreneurs in high esteem generally produce disproportionately large numbers of entrepreneurial firms while those that attach a stigma to business failure do not. These variations in the pace of new firm creation have important consequences since those regions generating a large number of new firms are typically more economically successful than those that do not (OECD 2004).

Table 6: Virginia Employment Change from Births and Expansions in Selected Large Sectors
2000 - 2001

Establisment Change[1]	Number of Establishments	Number of Jobs
Construction		
Births	2,154	9,360
Expansions	5,419	27,238
Manufacturing		
Births	388	6,429
Expansions	1,740	18,526
Wholesale Trade		
Births	653	5,805
Expansions	1,972	11,618
Retail Trade		
Births	2,300	18,133
Expansions	8,160	35,057
Transportation and Warehousing		
Births	597	3,808
Expansions	1,124	7,248
Information		
Births	590	15,157
Expansions	829	15,634
Finance and Insurance		
Births	1,265	27,884
Expansions	2,507	21,480
Real Estate		
Births	750	4,081
Expansions	1,495	5,922
Professional, Scientific, Technical Services		
Births	2,722	24,077
Expansions	4,987	45,382
Management of Companies and Enterprises		
Births	108	3,866
Expansions	334	7,787
Administrative and Other		
Births	1,142	15,283
Expansions	2,417	30,275
Educational Services		
Births	208	1,331
Expansions	639	4,277
Health Care and Social Assistance		
Births	1,235	9,761
Expansions	4,508	24,479
Arts, Entertainment, and Recreation		
Births	217	1,606
Expansions	577	4,144
Accommodations and Food Service		
Births	1,277	20,395
Expansions	3,709	21,747

[1] Births include businesses moving in; deaths include businesses moving out.

While it is widely recognized that entrepreneurial activity contributes importantly to economic growth, assessing the extent of that activity in local and regional economies like Hampton Roads has never been easy. Primary among the difficulties in determining a region's level of entrepreneurship is that little public data is collected on the number and location of entrepreneurs or of new

research done by or for the Office of Advocacy has a high degree of reliability as compared to work done by others with these derived and "weaker" databases.

business startups. Instead, governmental entities such as the Census Bureau and the Small Business Administration have historically collected information on businesses by size and type but not by their history, origin, growth rate, source of funding, pace of innovation, or ownership. As a result, it is possible to use published data sources to describe the number and type of small businesses but not to break out entrepreneurs from the rest of small business operators.

While these data limitations certainly hinder efforts to measure entrepreneurial activity in a local economy, other, indirect methods, can be used to make such an assessment. The use of those methods and their results for Hampton Roads are described below.

Two Recent Studies

Two recently completed studies provide MSA rankings on economic indicators that suggest the presence of entrepreneurial activity in Hampton Roads.

The Progressive Policy Institute and the Center for Regional Economic Issues at Case Western Reserve University jointly produced a report entitled, *The Metropolitan New Economy Index: Benchmarking Economic Transformation in the Nation's Metropolitan Areas.* This report analyzed the economic progressiveness of fifty metro areas around the nation including Hampton Roads. The report used a set of 16 indicators to assess the economic potential of each community to develop new industries in the future. Five of the indicators suggest how Hampton Roads compares to other large urban regions in entrepreneurial activity. Those indicators are the presence of gazelle companies, the degree of job churning in the economy, the number of initial public offerings as a share of gross metropolitan product, the number of utility patents per one thousand workers, and venture capital invested as a share of gross metropolitan product. The ranking on each of these indicators for Hampton Roads and selected reference MSAs are shown in Table 7.

The results from Table 7 suggest that Hampton Roads has considerably less entrepreneurial activity than other large metropolitan areas, both compared to its competitors as well as compared to the other 49 largest MSAs in the nation. In fact, Hampton Roads ranked last among the fifty MSAs in two categories, the number of gazelles and the pace of patenting activity, and 46th in the number of initial public offerings and the availability of venture capital. The region obtained a ranking of 40th in job churning, the region's best ranking among the five indicators, but perhaps the least meaningful of the five. Furthermore, when the rankings on the five indicators for Hampton Roads are compared to the rankings achieved by competitor MSAs, Hampton Roads had a better ranking in only two cases out of the 30 rankings given for the competitor regions (6 MSAs x 5 indicators = 30 rankings). Clearly, according to the New Economy report, Hampton Roads experiences limited entrepreneurial activity, and those activities

play a more limited role in the area's economy as compared to similar activity in nearby urban centers.

TABLE 7: Indicators of Entrepreneurial Activity in Hampton Roads and Selected Competitor MSAs

2001

	Rank Among 50 MSAs					
	Indicators of Entrepreneurial Activity					Average of Five Indicators of Entrepreneurship
	Gazelles	Job Churning	New Publicly Traded Companies	Patents	Venture Capital	
Hampton Roads	50	40	46	50	46	46.4
Selected Competitors						
Atlanta	21	2	8	32	11	14.8
Charlotte, NC	3	16	36	37	33	25.0
Greensboro, NC	31	14	27	35	50	31.4
Jacksonville, FL	15	21	46	45	41	33.6
Raleigh-Durham, NC	48	22	22	7	5	20.8
Richmond, VA	33	30	46	39	47	39.0
Average	25.2	17.5	30.8	32.5	31.2	27.4
Number of Competitors with a Lower Ranking than Hampton Roads	0	0	0	0	2	NA

A second study done by AngelouEconomics for the Hampton Roads Economic Development Alliance produced indicators that measure local economic activity. Of those indicators, two are especially instructive. The first is an assessment of the level of entrepreneurial activity in the region. The second is the availability of venture capital. The region was scored on each of these parameters with scores ranging from 1-5 with 1 being the least desirable and 5 being the most desirable.

The AngelouEconomics study gave Hampton Roads a score of only 2 for entrepreneurial activity. The study's report observed that while the Commonwealth is working hard to foster a stronger entrepreneurial climate statewide, the development of entrepreneurial businesses in Hampton Roads has been hampered by the fact that the region is dominated by traditional industries such as defense, manufacturing, and the port. Unfortunately for the region, those industries have not been among the leaders in producing entrepreneurs, as has been the case with cutting edge industries utilizing breakthrough technologies. (AngelouEconomics 2004).

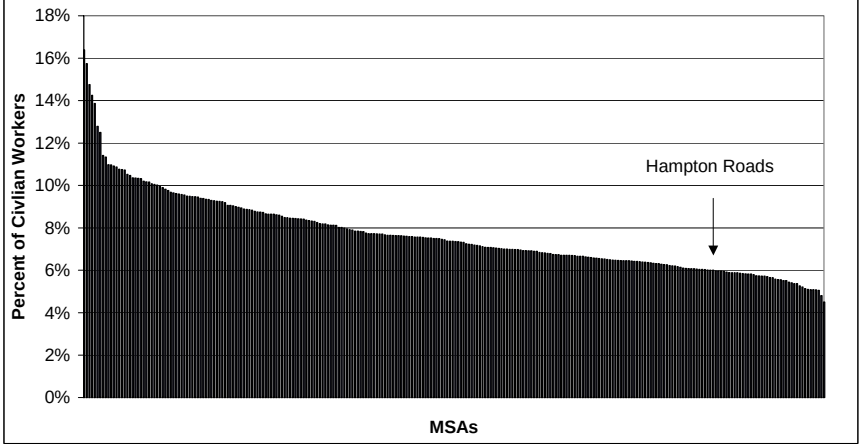
The region received an even lower score from AngelouEconomics on the presence of venture capital. Venture capital is vitally important to entrepreneurs and business startups, especially at the early stage of their growth cycle when financing is needed the most. Unfortunately, because the region has offered only limited opportunities to angel and venture capital investors, the region has not been able to develop a large pool of early stage investors willing to supply equity and debt financing. This has reduced the amount of funding available to the region's would-be entrepreneurs since traveling to distant locations to acquire financing is costly in terms of both time and money. This problem of acquiring funding is aggravated by the fact that potential suppliers of capital located outside of the region are frequently unwilling to fund businesses that are not nearby since venture capitalists like to be able to monitor activities at the businesses they finance so that they can provide advise and counsel when needed. AngelouEconomics found the availability of venture capital in Hampton

Roads to be very low and gave the region a score of one, the lowest possible rating, for the presence of venture capital funding. In fact, according to AngelouEconomics, in 2003 Hampton Roads received only 1 percent of the venture capital invested in Virginia. This contrasts sharply with the region's population which was 22 percent of the state total in the same year. Furthermore, in the past 7 years, the region has received only 5 percent of the venture capital funding supplied to the state (AngelouEconomics 2004).

Other Indicators

Another suggestion as to the level of entrepreneurial activity in the region is the presence of self-employment in the economy.[22] Self-employed persons are typically those who sell their labors to perform specific tasks. However, because a certain number of the self-employed will in time become entrepreneurs, the self-employed as a percent of all civilian workers is suggestive of the presence of entrepreneurial activity in a region.[23] The use of this metric suggests that entrepreneurial activity in Hampton Roads is very limited since the self-employed accounted for just 4.7 percent of all civilian jobs in 2000. This compared to 5.5 and 6.6 percent for Virginia and the U.S., respectively. Self-employment as a percent of all civilian employment by MSA is shown in Figure 2.[24]

Figure 2: Self-Employed Workers as a Percent of All Civilian Workers
2000



[22] Sectors of the economy differ in terms of the number establishments that do not have payroll employees. Frequently it is these non-payroll establishments that are owned and operated by entrepreneurs so that non-payroll establishments are taken as an indication of the location of entrepreneurs in the economy. U.S. non-payroll establishments as a percent of all establishments by sector are shown in Appendix A.

[23] A number of studies have used self-employment as a proxy for entrepreneurial creativity since they are believed to be highly correlated.

[24] Self-employment as a percent of total civilian employment is low in the U.S. as compared to most other developed nations of the world. In 1994, for example, self-employment as a percent of total civilian employment was 7.5 percent. This compared to 28.0 percent in Greece, 26.4 percent in Turkey, 24.7 percent in Mexico, 23.4 percent in Korea, 22.3 percent in Italy, and 18.9 percent in Portugal (OECD 2001).

Further evidence of the limited presence of entrepreneurial activity in the region comes from the lists of gazelles contained in national business publications.[25] One of those publications, *Inc.*, annually lists the nation's five hundred fastest growing small companies. The most recent listing from *Inc.,* published in the fall of 2004, shows that only two of the five hundred fastest growing companies are located in Hampton Roads. Using the size of the region's population as a guide, one would normally expect to find three such companies in the region. Another list, this one from the September 2004 issue of *Fortune*, enumerated the nation's one hundred fastest-growing companies. None of those companies were located in Hampton Roads. Both published lists suggest that the regional economy is under represented in fast-growing entrepreneurial companies.

Another marker for regional entrepreneurship is the presence of venture capital. One source of information on the availability of venture capital funding comes from tabulations compiled from the MoneyTree survey done by PriceWatersCoopers. That survey covers the investment activity of professional venture capital firms with or without a U.S. office, SBICs, venture arms of corporations, investment banks, and similar lending entities. Results from the survey indicate that in 2004 none of the 99 most active venture capital firms were located in Hampton Roads.

A further indication of the limited amount of entrepreneurial activity in the region comes from patent data from the U.S. Patent and Trademark Office (USPTO), an agency of the U.S. Department of Commerce. The USPTO issues patents, which are documents that grant a monopoly for a limited period of time covering the manufacture, use, and sale of an invention. In other words, the holder of the patent has the right to exclude others from making, using, selling or importing the invention into the United States. These rights last between 14 and 20 years depending on the type of invention. Patents are classified by USPTO into five categories: design, plant, utility, reissue, and statutory invention registration.[26] Utility patents, by far the most common, are granted for inventions and are the best indication of the innovative energy within a community.[27] The geographical distribution of patents is based upon the residence of the investor whose name appears first on the patent (Worgan 2002).

[25] It has been suggested that the presence of gazelles may be one of the best proxies for the degree of local entrepreneurial activity (OECD 1998).
[26] The three principle patents are utility patents for inventions, design patents for new, original, and ornamental designs for an article of manufacture, and plant patents for the development of a new variety of plant.
[27] Some argue that patents are an imperfect expression of innovation since not all patented inventions are innovative and not all innovations are patented.

The level of patenting activity within a metropolitan area suggests not just the pace of innovation in a community but also the level of entrepreneurial activity as well.[28] Fortunately, the total number of patents issued to applicants in Hampton Roads is large. For example, in 1999, the most recent year of patent data for MSAs, 132 utility patents were issued to applicants from Hampton Roads as can be seen in Figure 3. Unfortunately, patenting activity in Hampton Roads, when adjusted for the size of the MSA's population is low, again suggesting that entrepreneurial activity in the region is limited. For example, in 1998, 143 utility patents were issued to persons and institutions in Hampton Roads or 9.3 patents per 100,000 persons in the population.[29] This placed Hampton Roads in the 72nd percentile among MSAs with 72 percent of MSAs having more patenting activity than did Hampton Roads when adjusted for population size. The region's level of utility patenting activity per 100,000 private sector workers was also low when compared to other metropolitan

Figure 3: MSA Utility Patents in 1999

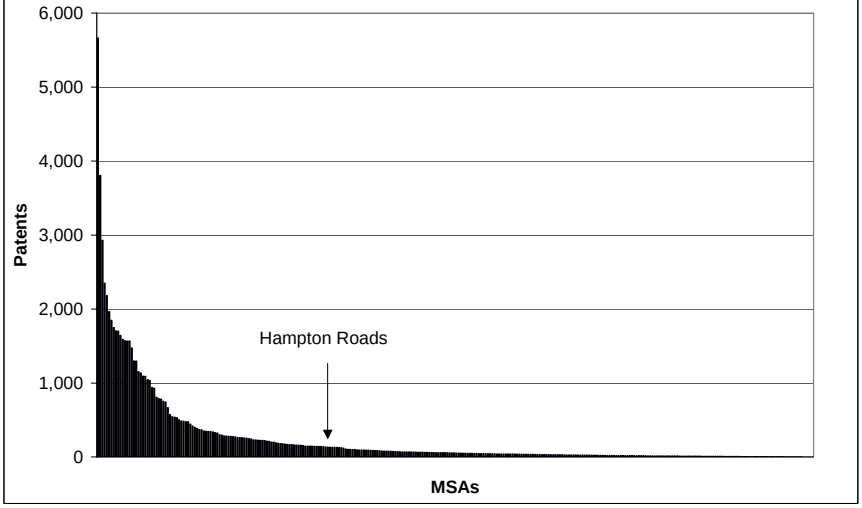
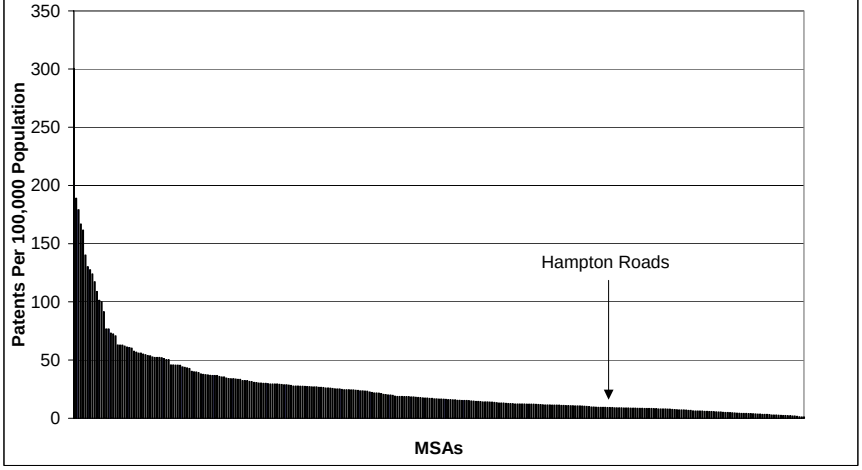


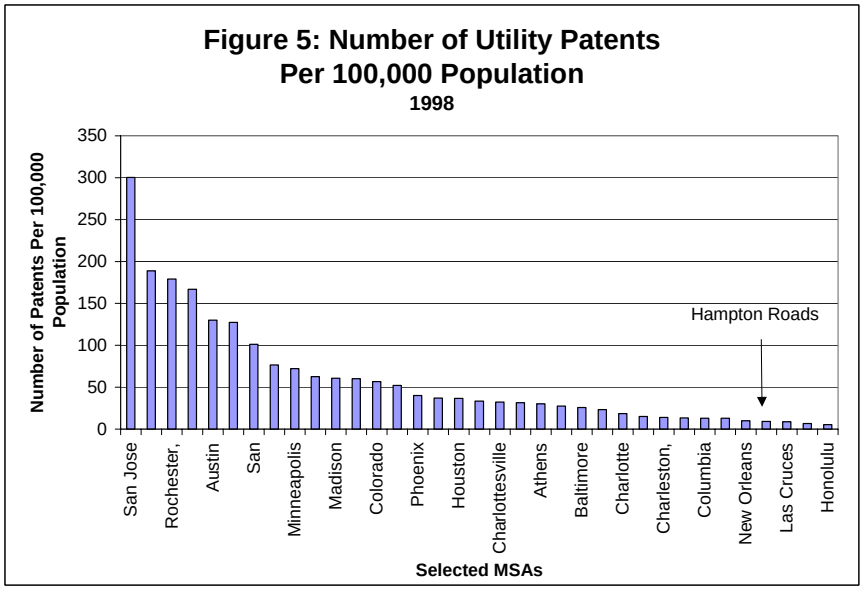
Figure 4: MSA Utility Patents Per 100,000 Population in 1998



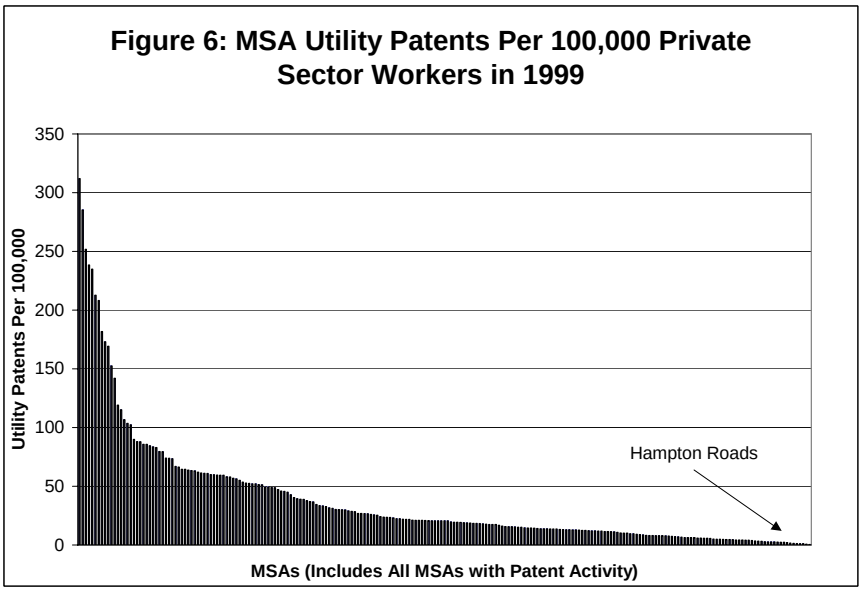
[28] Patent data is collected at the county level. However, because the number of patents awarded to inventors in a county may not necessarily reflect the level of innovation and invention activity occurring within that county. County patent totals are based upon where inventors live and not where they work and may have made their patentable discovery. However, at the metropolitan level, many of these geographical problems disappear since metro areas typically contain both the location of the inventor's place of residence and place of work.

[29] The latest data from the U.S. Patent and Trademark Office on patents per 100,000 is for 1998.

areas. MSA utility patents granted per 100,000 persons in the population in 1998 are shown in Figure 4. A comparison of patenting activity in selected MSAs is shown in Figure 5. Patents per 100,000 private sector workers are contained in Figure 6. The number of patents granted by jurisdiction in 1998 were as follows: Virginia Beach (35), Newport News (22), York Co. (17), Chesapeake (11), Hampton (11), Norfolk (10), Williamsburg (10), Isle of Wight Co. (5), Gloucester Co. (4), Suffolk (3), Mathews Co. (2), Currituck Co. (1), Portsmouth (1). Patents were not granted to residents of the remaining communities of the MSA.

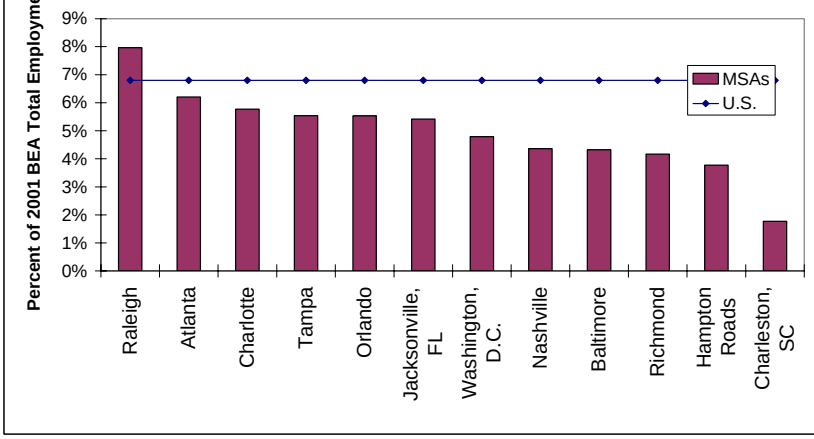


Perhaps the most convincing evidence of the under representation of entrepreneurial activity in Hampton Roads comes from the dynamic firm data supplied by the Office of Advocacy within the Small Business Administration. That new database, just released in June of 2005, shows the firm births and deaths for all of the nation's MSAs over the 2001 to 2002 period. Information on births and deaths has been organized both by the number of establishments as well as employment in those same establishments.



Data from the Office of Advocacy indicates that Hampton Roads is under represented in the birthing of new business establishments, and, by extension, the presence of entrepreneurial activity, since the number of jobs created in the region is a relatively small percent of all the area's jobs. The percent increase in employment in Hampton Roads along with similar changes in other reference economies in the Southeast is shown in Figure 7. As can be seen, new business starts contributed only 3.8 percent to the region's job base in going from 2001 to 2002 as compared to 6.8 percent for the nation overall. In other words, the pace of job growth from this source was only slightly over half of the rate for the nation. Raleigh was the single community among the reference economies to outpace the nation in the generation of new jobs through the birthing of new businesses.[30]

Figure 7: Employment Growth Created by Firm Births from 2001 to 2002 (Births Include Relocations)



EXPLANATIONS FOR REGIONAL ENTREPRENEURIAL ACTIVITY

A review of the literature reveals that much more work will be needed before there is a thorough understanding of the forces that drive regional entrepreneurship (Goetz 2001).[31] Indeed, mainstream economics has paid scant attention to this subject. This is surprising since the rate of enterprise creation differs markedly across regions. Some regions within OECD member countries, for example, have annual firm birth rates two to six times higher than in others.

Unfortunately, it is difficult to generalize from the literature about the location factors that drive entrepreneurial activity since rigorous analytical techniques have only occasionally been employed in published studies. At present, some of the literature focuses on single variables and the extent to which they influence local entrepreneurial activity without looking at all factors

[30] Newly created firms including business relocations created 36,413 jobs from 2001 to 2002 while the death of firms including the outmigration of companies destroyed 29,887 jobs over the same period.

[31] Much work has been done to estimate the determinants of entrepreneurship at the national level. However, little work has been done to assess the determinants of entrepreneurship at the regional level (Georgellis 2000).

together so as to gain an appreciation of the relative important of each. Other parts of the literature are largely qualitative in nature, further adding to the difficulty of determining the importance of individual factors (OECD 2003).

Past Studies

A review of past efforts to assess the importance of factors which contribute to the presence of entrepreneurial activity in a region can help to gain an understanding of entrepreneurial activity in Hampton Roads.

One effort to outline the factors influencing regional entrepreneurial activity was done in 1994. That study identified six factors. They were demographics, unemployment, wealth, a region's educational and occupational profile, the prevalence of small firms, and the presence of owner-occupied housing. The rationale behind this selection of predictors was that entrepreneurship is higher in urban than in rural areas, that unemployed persons are motivated to start new enterprises, that higher levels of wealth generate demand and increase the availability of capital, that the prevalence of small firms can inspire others to entrepreneurial efforts, and that owner-occupied housing can supply the capital needed by business startups (OECD 1998).

Another study was done by Bruno and Tyebjee. Their work identified 12 factors that contribute to the formation of an entrepreneurial environment. They were (1) venture capital availability, (2) the presence of experienced entrepreneurs, (3) skilled labor force, (4) access to suppliers, (5) access to markets, (6) favorable government policies, (7) access to universities, (8) availability of land, (9) access to transportation, (10) the presence of a receptive population, (11) the availability of supporting or producer services, and (12) an attractive living environment (Bruno 1982).

A further study, this one done by Bearse, proposed eight factors that contribute to a local climate favorable to entrepreneurial activity. Unfortunately, most of the factors identified were not easily measured. They were (1) the level of instability in a community, (2) the level of uncertainty created by unexpected events and inter-firm competitive rivalry, (3) the degree of fluidity in the social structure and the availability of services and information, (4) the level of diversification in the industrial, occupational, and social structure of the community, (5) the availability of resources, (6) the presence of a critical mass of entrepreneurs and institutions involved in the gestation of new technologies, (7) the cultural traditions of local groups, and (8) government policies (Malecki 1997).

A final study, done by Dubini, concluded after studying six cities in Italy that communities with positive entrepreneurial environment have (1) a multitude of family businesses and role models, (2) a diversified economy in terms of the size of companies and industries represented, (3) a rich infrastructure, (4) a solid

financial community, and (5) the presence of government incentives to start a new business. Factors which work against the creation of new business ventures are (1) the lack of an entrepreneurial culture along with networks and special organizations or activities aimed at new companies, (2) the lack of a tradition of entrepreneurship and family businesses, (3) an absence of innovative industries, (4) limited infrastructure, (5) limited capital markets, and (6) few government incentives to start a new business (Malecki 1997).

While not specifically addressing the issue of entrepreneurship, Sweeney listed factors that can lead to an innovative regional environment and, by extension, the creation of new businesses. The factors contributing to regional innovation according to Sweeney were (1) the sectoral and technological mix of regional industries, (2) the strength of the engineering sector, (3) the autonomy of decision-making in the industries and infrastructure of a region, (4) the dominance of employment in one or two sectors, (5) the strength or weakness of the information sector, and (6) the technological orientation of the educational system (Malecki 1997).

Of special importance to Hampton Roads is the work done by Hjalager (1989) who listed the types of economies, which produce few entrepreneurs. On his list of communities with little entrepreneurial activity were those dependent on mining and shipbuilding (Malecki 1997).

Production Functions

One technique only occasionally used to investigate the factors that determine the level of entrepreneurial activity within America's urban centers is the production function. Production functions are statistically derived equations, which relate an output or outcome to a set of predictor or explanatory variables. In the case of entrepreneurship, the outcome is the number of entrepreneurs or entrepreneurial companies in a region while the inputs or the explanations offered for the level of entrepreneurial activity include a variety of factors such as education, industrial structure, taxes, etc. Once the equation has been specified with measurements made for each of its variables, the equation can be calibrated using data for a set of urban centers through the use of regression techniques. While there are many difficulties, which must be overcome in the execution of this analytical approach, perhaps the greatest is identifying an expression of regional entrepreneurial activity given the limited amount of information on the number of entrepreneurial firms in the nation's urban centers.[32]

The creation of a production function for entrepreneurial activity has the potential to be of great value since it would allow policy makers and others to

[32] Good examples of the use of production functions in non-industrial settings is their use to evaluate factors which are important in determining educational outputs. Variables commonly used in the equations to explain the quality of education in U.S. schools include school resources, various aspects of the home environment, and "peer group effects."

understand what factors drive regional entrepreneurial activity, the relative importance of each of the drivers, and perhaps most important of all, what can be done to foster additional entrepreneur activity in a region. Production functions can be used by a community to determine why it experiences the level of entrepreneurship that it does.

One attempt, and according to the authors, the only attempt to create a production function for entrepreneurship was conducted by Stephan Goetz and David Freshwater using state data. They hypothesized that entrepreneurial activity is a function of four variables: ideas and innovation, human capital, financial capital, and entrepreneurial climate. The first three were quantified and entered directly into the model while the last was assumed to be embedded in the equation's error term. In their formulation, ideas and innovation were seen as necessary to generate new products and production processes while human and financial capital was hypothesized to be required for entrepreneurial activity to develop. Since each of the three factors which were entered into the model were themselves a function of other variables, all input data was converted to z scores and added together to produce a small number of explanatory variables.[33] Shrinking the size of the data set was necessary since their database contained only 50 observations – one for each state (Goetz 2001).

Results from the work done by Goetz and Freshwater were revealing. They found each of their explanatory variables to be statistically significant and therefore important in predicting entrepreneurial activity. Furthermore, their results indicated that Virginia had the highest level of entrepreneurial activity not explained by the model suggesting that the entrepreneurial climate in the state is very good since both Virginia and Georgia have higher than expected levels of entrepreneurial activity relative to their level of entrepreneurial inputs (ideas and innovation, human capital, financial capital). The authors speculated that the above average performance of Virginia was due to the influence of activities in the suburban areas outside of Washington, D.C. Goetz and Freshwater observed that enhancing education as well as the availability of financial resources are the two areas in which state actions are most likely to generate additional entrepreneurial activity. Of special importance to Hampton Roads is their finding that states with major federal research laboratories did not generate significant levels of entrepreneurial activity (Goetz 2001).

EXPLANATIONS FOR THE MODEST LEVEL OF ENTREPRENEURIAL ACTIVITY IN HAMPTON ROADS

The preponderance of the evidence suggests that Hampton Roads is below average among the nation's metro regions in its level of entrepreneurial activity. This works to the region's detriment since entrepreneurial regions generally have healthier economies with faster growth, lower unemployment, and

[33] Factor analysis is sometimes used to reduce the size of a database. The resulting factors are then entered into the model.

higher incomes and wages than those characterized by limited entrepreneurial activity. It is for this reason that Hampton Roads must find ways to accelerate its rate of new business formation – especially among those firms that export innovative products and services beyond the boundaries of the region. Unfortunately, identifying the factors which account for the region's underperformance is difficult given the many factors which influence its economic activity. However, it is worthwhile to identify those factors so that meaningful efforts can be made to create a more entrepreneurial region.

The factors listed below are believed to encompass many but not all of the factors which account for the region's below average standing in entrepreneurship. Many are beyond the region's control since they are a product of the kinds of businesses and industries, which make up the region's economy. Others are more malleable and can be influenced by state and local efforts.

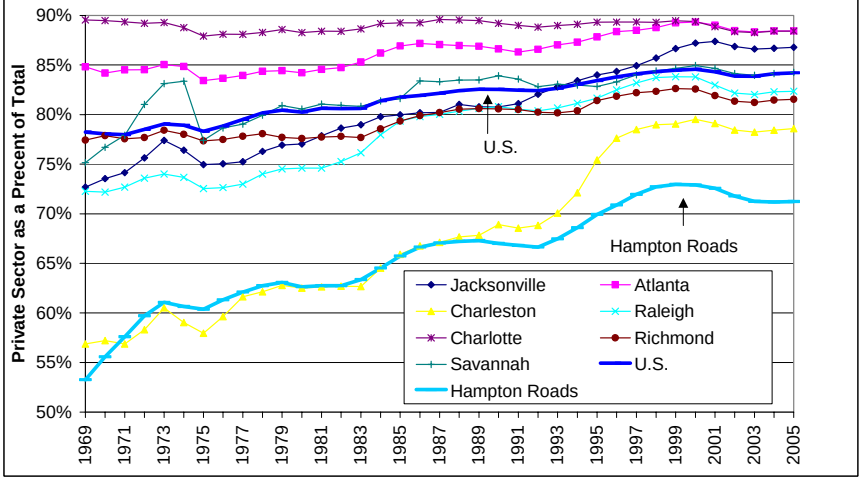
Not all regions can produce a large number of entrepreneurial firms. One bias working against the establishment of new firms is the sector composition of a local economy. Some sectors are prone to produce entrepreneurial activity since their barriers to entry are low, their level of innovation is high, and their rate of growth is high generating new opportunities for would-be entrepreneurs. Regions with a mix of these high growth and high innovation sectors are very likely to produce entrepreneurs with considerable regularity. By contrast, other regions possess a mix of sectors, which are less dynamic and, as a result, generate far fewer new entrepreneurs each year. The importance of this sectoral bias is reinforced by the fact that new firms tend to be formed in the sectors already found in the region since knowledge of those sectors is high (Malecki 1997).

Unfortunately for Hampton Roads, the region's primary sectors grow at average to below average rates and thus do not generate large numbers of entrepreneurial opportunities. Examples of slow growing local sectors are tourism, the military, shipbuilding, and defense contracting generally. Details of sector growth rates can be found in the first document in this series entitled, *The Hampton Roads Economy – Analysis and Strategies: Part 1.*

Compounding this problem is the fact that much of the region's employment is in public sector enterprises. This is important since entrepreneurs, by definition, operate in the private sector so that the size of the private sector will determine, to a large degree, a region's potential to generate entrepreneurial activity. In addition, to be successful, entrepreneurs must be able to discover new, untapped opportunities in the economy that can be exploited. Persons in the best position to do that are those who work in the private sector. By contrast, persons who work for the public sector have less exposure to the private economy and, as a result, may be less able or inclined to start a new company. Finally, there is the matter of the inclination of various groups to consider starting a new business. It seems likely that those persons

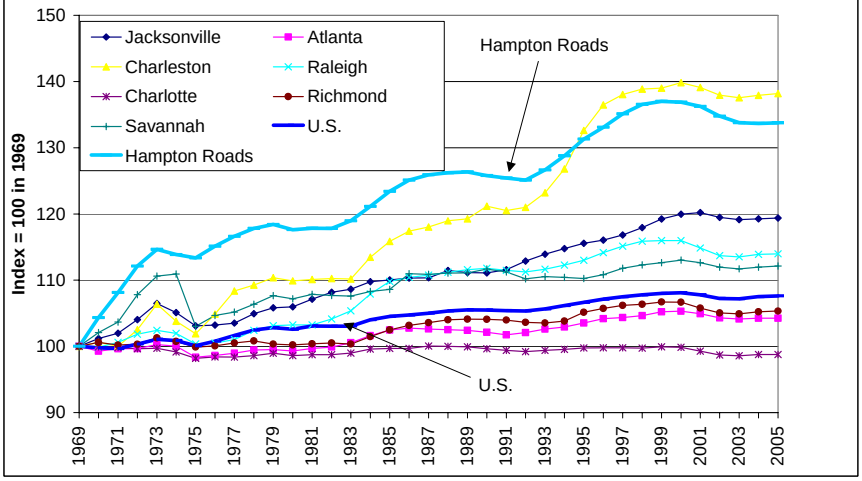
who have chosen a career in government are less inclined to take the risks that are inherent in forming a new business than those who have spent their careers in private enterprises. In essence, there is some evidence that there are cultural differences between those who are attracted to the private sector and those who are attracted to work in the public sector (Lyons 2001). Because Hampton Roads is a governmental center with a disproportionately large share of its workers employed in public sector activities, it is likely that the region's potential to generate new private sector enterprises is less than what one would normally expect of an urban area of comparable size with a much higher share of its economic activities engaged in private sector pursuits. Private sector employment as a percent total employment in Hampton Roads, its primary regional reference economies, and the U.S. are shown in **Figure 8**.

Figure 8: Private Sector Employment as a Percent of Total Employment



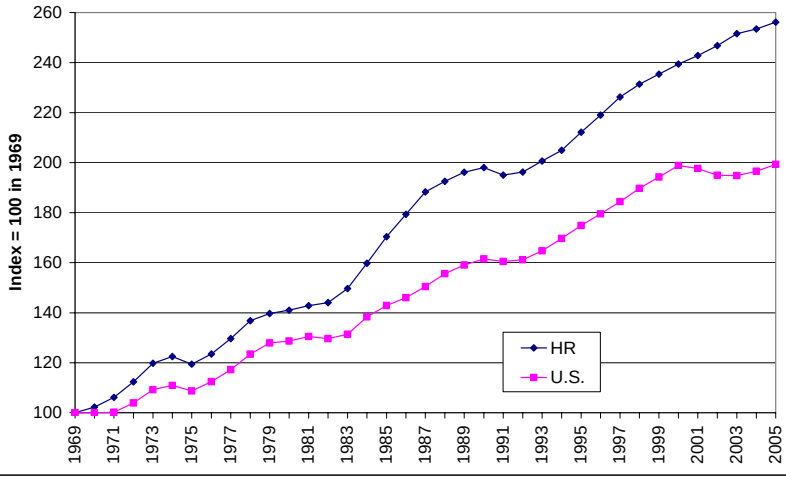
Because Hampton Roads has been diversifying its economy away from its dependence on the federal government, the region is growing its private sector as a percent of the total economy faster than the U.S. and other nearby urban areas as can be seen in **Figure 9**. This will in time enhance the region's rate of new business formation. **Figure 10** extends this comparison by showing the growth in private sector jobs in Hampton Roads relative to the U.S.

Figure 9: An Index of the Growth in Private-Sector Employment as a Percent of Total Employment



A further characteristic of the regional economy impacting on its ability to generate entrepreneurial activity is the extent to which it performs headquarters and commercial research functions. In general, regional economies tend to have either a concentration of headquarters, offices, and research and development facilities or, more commonly, branch production plants. Those regions whose economies are dominated by branch facilities have historically not produced a large number of entrepreneurs. This outcome results from the fact that the skill and educational level of branch plant employees are generally lower than those found in communities with headquarters and research and development facilities. As a result, their knowledge of such things as entrepreneurship, business practices, sources of capital, and business and market information is low. Furthermore, employees in branch plants have little contact with innovations within their company or industry since, by definition, they are in branch plants and not near their firm's research and headquarter locations. Finally, the employees in branch plants tend to communicate vertically to those in headquarter locations elsewhere rather than horizontally with other firms in the local area. This reduces their exposure to local economic conditions and opportunities. As a result, communities dominated by branch plant operations normally experience only limited innovation and entrepreneurship. It is difficult to overcome this branch plant disadvantage (Malecki 1997).

Figure 10: The Growth in Private Sector Jobs: Hampton Roads and the U.S.

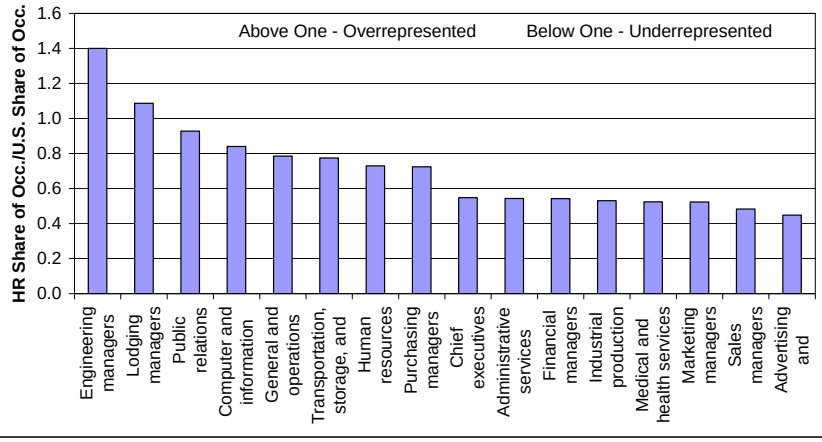


The private sector within Hampton Roads can be thought of, in many ways, as a branch plant economy since there are a only limited number of commercial headquarter and research operations in the region. This lack of headquarter and research functions and the region's abundance of branch plant operations is reflected in its occupational structure which generally shows a limited number of corporate managers relative to the large number of "plant operator" occupations (equipment operators, assembly line workers, first line supervisors, foremen, etc.). While it is not easy to measure the extent to which Hampton Roads exhibits the characteristics of a branch plant economy, it does appear that this aspect of the region's economy works against the development of an entrepreneurial environment.

The influence of a community's sector mix is compounded by the fact that each sector employs a very different mix of occupations and educational levels. Those regions with sectors, which employ a well-educated workforce, have a natural advantage since better-educated people are more likely to have information that can be used to create new firms. Additionally, those sectors that are technically based have well educated technical and professional employees who are in a good position to exploit opportunities in new technologies (Malecki 1997). Finally, research has shown that the higher the proportion of managers in a community, the higher the level of new business formation (OECD 1998). This relationship is not surprising given the fact that managers typically possess the range of technical and other business skills required to create and run a new enterprise.

The impact of these occupational and educational issues on entrepreneurship in Hampton Roads is mixed. On the one hand, Hampton Roads suffers from a lack of corporate management positions. This is a manifestation of the region's branch plant orientation and contributes to its "brain drain" of management talent to other regions. The region's location quotients which are below one in the majority of the region's managerial occupations is shown in Figure 11 and is an expression of the under representation of managers in the area's economy.[34] This under representation of managerial jobs in the region is the primary reason that many newly graduated MBAs from area colleges and universities leave the region for work elsewhere.[35] Fortunately, while

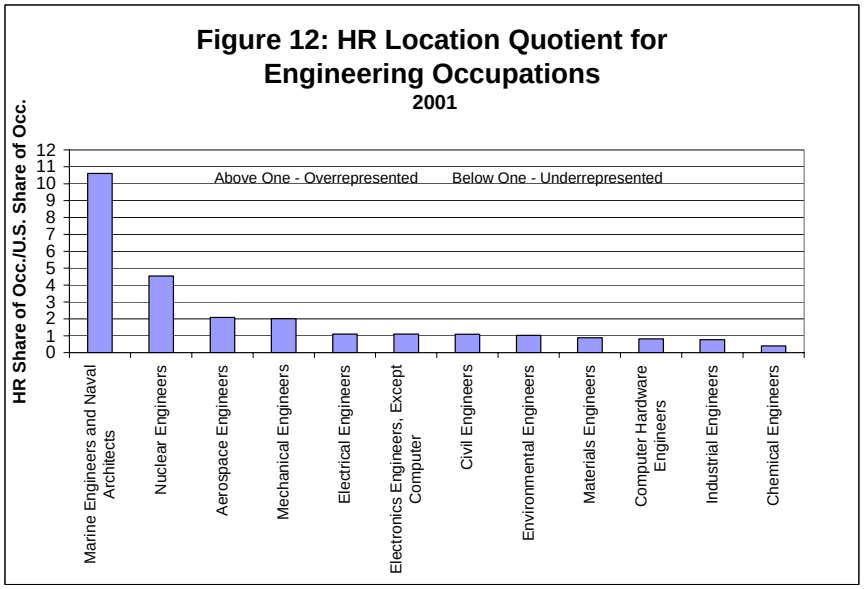
Figure 11: HR Location Quotients for Management Occupations, 2003
Source: Bureau of Labor Statistics



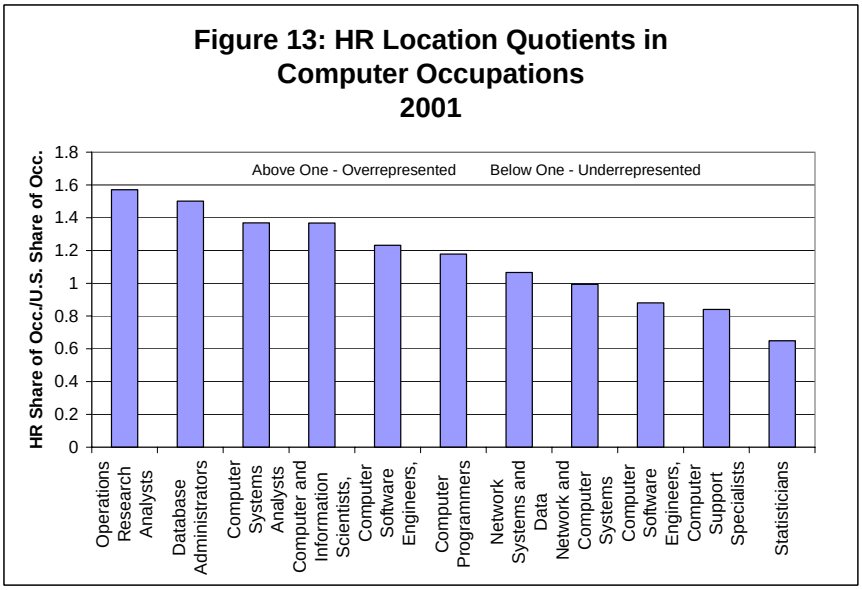
[34] A location quotient is a ratio of ratios. The numerator ratio is the number of workers in Hampton Roads in the occupation under study divided by the number of employees in all occupations in the region. The denominator ratio is the number of workers in the U.S. in the occupation under investigation divided by the number of employees in all occupations in the U.S. The location quotient results from the division of the numerator by the denominator. Location quotient values greater than one indicate an above average representation in the occupation locally. A value below one indicates an under representation in the occupation locally. A value of one indicates that the share of workers in the occupation under study has the same degree of representation locally as the nation overall.

[35] Norfolk Southern is the only employer in Hampton Roads that hires several MBAs at a time with some regularity. Other locations employing Hampton Roads MBA graduates in significant numbers are Richmond, Philadelphia, Baltimore, and New York (Clay 2003).

the region is not a center for managerial activities, as evidenced by its occupational mix, it is over represented in a number of important technical occupations. The location quotients for a wide variety of technical specialties are shown in Figures 12-14. A summary of the highest location quotients from Figure 12-14 is shown in Figure 15.



The region's under representation in private sector managers tends to limit its potential to generate entrepreneurial activity. On the other hand, the region benefits from its relative abundance of technically trained persons in the private sector. In fact, the region ranks among the top four metro areas in the nation in terms of the proportion of its population trained as scientists and engineers. Unfortunately, the region fails to fully capitalize on its large pool of well-trained labor since most of its scientists and engineers are employed in federal labs and other facilities and are not closely tied to those entrepreneurial activities that generate new firms, patents, and the commercialization of ideas (ODU 2000). This may change in years to come since Hampton Roads is creating technical occupations faster than the nation overall as can be seen in Figure 16. This above average rate of growth will work



to the region's advantage as it attempts to enhance its level of entrepreneurial activity.

Hampton Roads appears to "break even" on educational attainment since it has nearly as large a share of its adult population (25 years of age and over) with bachelors and graduate and professional degrees as the nation as a whole. According to 2000 Census numbers, 15.3 percent of the region's adults have a bachelor's degree as opposed to 15.5 percent for the nation overall. Hampton Roads is also near the national average in the share of its adults with graduate and professional degrees in 2000 with 8.4 percent of the region's adults having an advanced degree as compared to 8.9 percent nationally. It would seem that, with respect to educational attainment (not the type of education by area of study), Hampton Roads is not significantly disadvantaged relative to the nation overall.

Figure 14: HR Location Quotients for Selected Scientific Occupations
2001

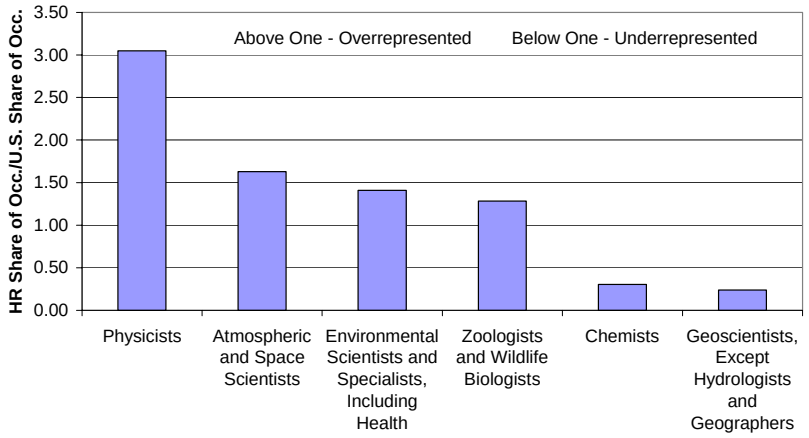
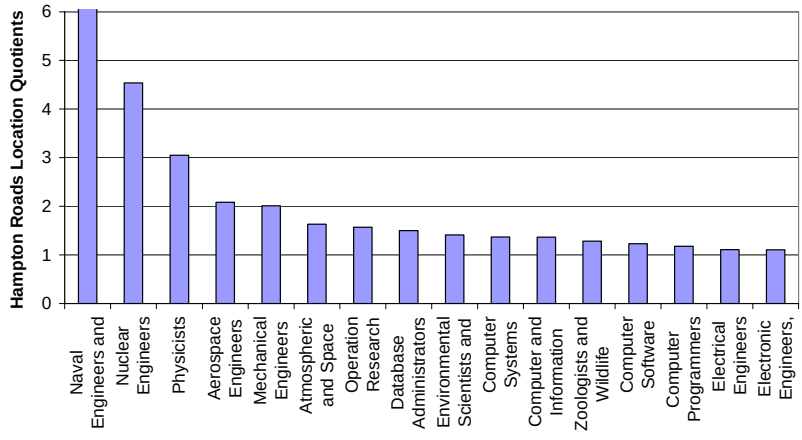


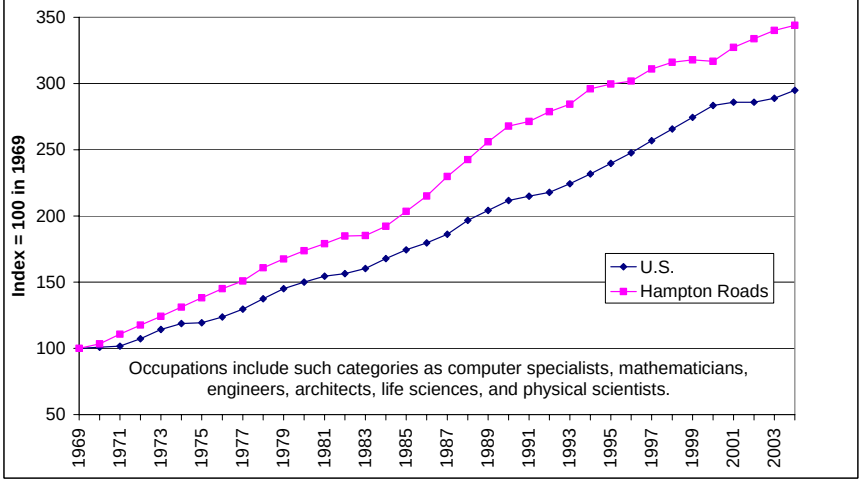
Figure 15: Location Quotients for Computer/Engineering/Scientific Occupations in Hampton Roads



Another factor of great importance in determining the pace of local entrepreneurial activity is the presence and size of the small business sector. Research has shown that the presence of small firms leads to the creation of other small firms. In other words, small firms beget other small firms. This phenomenon is driven, in part, by the fact that the employees of small firms have had a wide variety of experiences,

which enable them to take on the many tasks faced by entrepreneurs. Those employees also benefit from the fact that they have been exposed to small business role models as a part of their daily activities. They have had the opportunity to watch and learn from the owners of their own and other small businesses. In essence, those regions with a well-developed small business sector tend to generate new businesses at disproportionately high rates as compared to regions without a small business tradition. By contrast, those regions with a disproportionately large number of large firms tend to be less entrepreneurial (Malecki 1997).[36]

Figure 16: The Growth in Technical Occupations; Hampton Roads and the U.S.



Another factor contributing to the link between the small business sector and entrepreneurship is job security. Job security is generally less in small businesses so that employees of those establishments are more likely to leave to create their own businesses. By contrast, employees working in large firms have more benefits and job security so that they are less likely to strike out on their own.

The size of the region's small business sector in Hampton Roads appears to place the region at a slight disadvantage since small businesses are slightly under represented among the area's private sector firms. As can be seen in Table 8, 17.1 percent of the region's employees work in firms employing up to 19 workers as compared to the U.S. with 18.1 percent of its employment in firms of a comparable size.

[36] Sector mix plays a very important role in determining the number of small businesses in a community since some sectors have a higher concentration of small businesses than do others. For example, small businesses constitute 74 percent of the output in real estate, rental and leasing, 76 percent of the output in arts, entertainment, and recreational services, and 90 percent of the output in construction. By contrast, small firms constitute just 22 percent of the output in the utility sector, 25 percent of the output in information, 29 percent of the output in finance and insurance, and 30 percent of the output in mining and manufacturing. As a result, those regions with a sector mix with an above average weighting in small business will have a larger than average number of small, entrepreneurial businesses (Watson 2005).

Also important to the generation of new businesses is urban size. Urban areas appear to have a natural advantage over non-urban areas in the creation of new firms and in the degree of patenting activity as well as other forms of innovation. This may be explained in large part by the greater abundance of opportunities to network and to acquire business services and information in large urban centers. In general, large urban areas have most of the advantages, which new business firms require: an abundance of skilled labor, capital, amenities, and professional and technical services (sometimes referred to as producer services). New small firms needing supporting services can readily find them in urban centers that will enable them to rely on external services rather than incurring the expense of creating those capabilities in house. By this measure, Hampton Roads is well positioned since it is among the largest urban centers in the nation with a population of 1.6 million people and approximately one million jobs.

Table 8: Selected REMI Relative Cost of Production 2002

Sector	Cost of Production in HR as a Percent of the U.S.[1]
Forestry and Fishing	96.0%
Mining	94.2%
Utilities	100.9%
Construction	95.3%
Wholesale Trade	95.4%
Retail Trade	93.6%
Manufacturing	102.8%
Transportation and Warehousing	103.6%
Information	96.9%
Newspaper, Book, Periodical Publishing	92.2%
Software Publishing	72.1%
Internet Services and Data Processing	103.0%
Finance and Insurance	91.0%
Professional Technical Services	96.8%
Legal Services	92.5%
Accounting, Tax Preparation, Bookkeeping Services	82.0%
Architectural and Engineering Services	97.5%
Computer Systems Design	102.6%
Management of Scientific and Technical Services	85.2%
Scientific Research	101.3%
Advertising Services	93.7%
Management of Companies and Enterprises	77.4%
Administrative Services	93.1%
Employment Services	84.4%
Business Support, Investment, and Secretarial Services	89.8%
Travel Arrangements and Reservation Services	79.5%
Health Care	95.9%
Arts, Entertainment, Recreation	87.0%
Performing Arts and Spectator Sports	78.1%
Amusements and Recreatioin	86.4%
Accommodations and Food Services	95.7%
Hotels and Lodging	88.5%
Food Services and Drinking Places	97.5%

[1]Includes cost of labor, capital, intermediate inputs, and fuel.

The real wage rate relative to the wages found in other regions is also a factor in determining the level of an area's entrepreneurial activity. Research has shown that the higher a region's average wage rate, the lower the level of entrepreneurial activity. This negative

relationship reflects the fact that the opportunity cost of starting a new commercial venture is higher in communities where wages are high. The opposite is true of communities with low wages. High opportunity costs tend to keep would-be entrepreneurs in the employed workforce.

The region's real wage rate adjusted for its cost of living may encourage, ever so slightly, the formation of new enterprises since wages paid in Hampton Roads are below the national average. These below average regional wages are offset in part by the area's below average cost of living. When the two measures are combined to estimate regional purchasing power, Hampton Roads has historically averaged at and usually slightly below the national norm. This below average wage, adjusted for the cost of living, would appear to favor the formation of new firms since it reduces the opportunity cost of creating a new business enterprise.

Related to wages is regional wealth. Affluent regions generate higher rates of new business formation due to the presence of higher local demand. Perhaps of greater importance is that affluent regions have a greater abundance of capital for business startups and expansions.[37] Unfortunately, reliable information on regional wealth is not available. However, three indicators suggest that the region's wealth position is likely to be below average. The first of these, the average regional wage in Hampton Roads, is below the national average. This suggests that the region's wealth position is likely to be below average for a community of its size since wages are one of several generators of a community's wealth position. A second indicator of regional wealth is the proportion of a community's population, which owns their home since, for a large proportion of the population, equity in the home is the principal component of personal wealth. By this measure, Hampton Roads also appears to have a below average wealth position since the region's homeownership rate is below the U.S. average.[38] Finally, the region's income from invested capital (interest, dividends, rents, and royalties) is relatively low further indicating that the region's wealth is below average. Each of these indicators (wages, non-labor income, and home equity) predict that the region's wealth position is below average. This below average wealth position may have hampered the development of new small businesses in Hampton Roads. This wealth effect is compounded by the region's relatively low proportion of high net worth individuals since it is those persons who frequently become angel and venture capital investors (ODU 2002).

Quality of life is a further factor, which impacts on a community's ability to generate and, more especially, retain the new businesses that they create. While not everyone agrees as to what constitutes a good quality of life, the fact remains that those communities that are judged by a large number of people to

[37] Cross-country comparisons show that self-employment, and therefore entrepreneurial activity, declines with increases in per capita income (OECD 2003).
[38] According to the 2000 Census, 62.7 percent of the housing in Hampton Roads was occupied by owners as compared to 66.2 percent nationally.

have a good quality of life will likely generate and retain entrepreneurs. Since many entrepreneurs are "footloose" and can move their operations to locations of their choosing, communities with a good quality of life will attract entrepreneurs. Fortunately, most assessments done of the quality of life in Hampton Roads have rated the region above average on this important dimension suggesting that the area will be able to retain an above average proportion of the new firms that it generates.

Retaining new firms is further bolstered by the region's relatively affordable cost of doing business. In general, largely because of the area's below average labor rates, the region's production costs are below the national average in the majority of sectors. The region's below average cost structure helps to make and keep area firms competitive and profitable so that once new firms have been created, the chances are good that they will remain in business and continue to find the region to be a good location from which to operate. A comparison of regional production costs across sectors compared to similar sectors nationally is shown in Table 9.

Table 9: Percent of Employment by Employment Size of Enterprise

		Percent of Employment by Employment Size of Enterprise							
								Composite	
	Total	0-4	5-9	10-19	20-99	100-499	500+	<20	<500
U.S.	100.0%	4.9%	5.9%	7.3%	17.8%	14.3%	49.9%	18.0%	50.1%
Atlanta, GA	100.0%	4.0%	4.4%	5.5%	14.5%	12.4%	59.2%	13.9%	40.8%
Charleston, SC	100.0%	4.7%	6.1%	7.9%	18.2%	11.9%	51.3%	18.6%	48.7%
Charlotte, NC	100.0%	3.8%	4.7%	6.1%	14.9%	12.1%	58.3%	14.6%	41.7%
Charlottesville, VA	100.0%	5.8%	6.8%	8.4%	20.0%	14.5%	44.4%	21.0%	55.6%
Columbia, SC	100.0%	4.0%	5.2%	6.4%	16.8%	12.3%	55.4%	15.6%	44.6%
Greensboro, NC	100.0%	4.1%	5.0%	6.2%	17.0%	14.1%	53.6%	15.3%	46.4%
Greensville, SC	100.0%	4.0%	5.0%	6.2%	15.1%	11.5%	58.2%	15.2%	41.8%
Jacksonville, FL	100.0%	4.3%	4.9%	5.7%	13.4%	11.1%	60.6%	14.9%	39.4%
Orlando, FL	100.0%	4.3%	4.4%	5.4%	12.4%	11.5%	62.0%	14.0%	38.0%
Raleigh, VA	100.0%	4.1%	5.0%	6.4%	16.0%	11.6%	56.9%	15.5%	43.1%
Richmond, VA	100.0%	4.0%	5.0%	6.3%	15.8%	12.1%	56.8%	15.3%	43.2%
Savannah, GA	100.0%	4.6%	5.8%	7.4%	17.6%	14.9%	49.6%	17.9%	50.4%
Tampa, FL	100.0%	4.9%	4.9%	5.6%	12.6%	10.7%	61.4%	15.4%	38.6%
Washington, DC	100.0%	4.3%	5.1%	6.6%	17.7%	16.4%	49.9%	16.0%	50.1%
Selected Competit	100.0%	4.3%	5.2%	6.4%	15.9%	12.7%	55.5%	15.9%	44.5%
Hampton Roads	100.0%	4.2%	5.7%	7.2%	17.3%	14.3%	51.3%	17.1%	48.7%

Regional demographics can shape an area's entrepreneurial performance. For example, successful entrepreneurs are typically middle age persons.[39] [40] Very young people are generally prohibited from going into business due to capital constraints, the lack of an established business or professional network, and more limited work experience (OECD 1998). Similarly, older persons are frequently unwilling or unable to undertake the risks and rigors of founding a new

[39] One study found that the businesses owned by entrepreneurs over thirty-five years of age have greater survival probabilities. Another study showed that entrepreneurs who are fifty years of age or older have a sixty-six percent probability of being in business for three years while the probability drops to below fifty percent for persons younger than twenty-five (OECD 2004).

[40] The Global Entrepreneurship Monitor found that the largest share of entrepreneurs were men ranging in age from 25 to 54 (Bednarzik 2000).

business. By contrast, middle age persons have the advantage of maturity in their business or professional work as well as the requisite capital required to start a new enterprise. Regions with large middle age populations, in this case 33 to 50 years of age, have above average levels of entrepreneurial activity.

A further demographic predictor of entrepreneurship is the presence of women and minorities in the population. Both are negatively related to the pace of entrepreneurial activity. While the demographics of entrepreneurship are changing, women, in a twenty-nine-country survey, were found to have participated in entrepreneurial activities at half the rate for men.[41] By contrast, young women are self-employed in substantial numbers, especially if they have young children, since they require flexibility in their work schedules. Further, women tend to start smaller projects than men which helps to explain why female-owned businesses experience higher levels of business failure. In contrast to women, there is evidence that minorities engage in entrepreneurial activity at higher than average rates (OECD 2004).[42] Fortunately, the region's basic demographic characteristics (age, race, and sex) are sufficiently close to national norms so as not to constitute a major hindrance to new business formation and entrepreneurial activity generally.

Finally, the region's entrepreneurial sector is hampered by the diffuse nature of its technologies. Fortunately for Hampton Roads, the region has a considerable inventory of technology assets from which new entrepreneurs could emanate under the right set of circumstances. However, the region has not yet been able to capitalize on the presence of these research capabilities. The challenge for the area is to find ways to tap into its technological resources so as to create a higher level of new enterprise formation (ODU 2000).

There are several centers of excellence in science and engineering in Hampton Roads. They include, but are not limited to, the NASA Langley Research Center, the Jefferson Laboratory, the Joint Training, Analysis and Simulation Center, Northrop Grumman Newport News Shipyard, the Eastern Virginia Medical School, and research facilities at the region's institutions of higher learning.

While the list of the region's research assets is impressive, Hampton Roads suffers from the fact that each of these institutions is independent and, as a result, operates without a common research agenda or mission. If all of these facilities were to merge, pursue a common set of goals, and emphasize the

[41] Since the 1970s, women have started new businesses at a rapid pace and have experienced a six-fold increase in their share of business ownership in the U.S. (OECD 2004).
[42] Women may face additional obstacles less commonly experienced by men such as the need to divide time between household and family responsibilities, limited business experience and smaller networks, the tendency to make small investments, and the difficulty of being taken seriously by some lenders (OECD 2004).

commercialization of their research results, the region would rank among the leading research establishments in the nation (ODU 2000).

Examples of the many directions being taken by some of the area's research organizations dramatize this lack of cohesiveness in the region's multifaceted efforts. NASA Langley emphasizes aeronautics research although it has been weakened in recent years by budget cuts. Another federal facility, the Jefferson Laboratory, helps to place the area on the nation's technology map but its work focuses on high-level nuclear physics research into the nature of matter. While this research will advance the state of scientific knowledge, so far it has spawned few technology spin-offs that have benefited the region. The Joint Training, Analysis, and Simulation Center (JTASC), conducts large-scale simulations of military actions and political events. Related to the activities of JTASC are the simulations conducted at Virginia's Modeling, Analysis, and Simulation Center (VMASC). Further research is done at the Virginia Advanced Shipbuilding and Carrier Integration Center (VASCIC) which is working to enable the Navy to construct the next generation of aircraft carriers (ODU 2000).

Unfortunately for the region, while the sheer volume of scientific and engineering research is impressive, the work being done has remarkable little focus. The region suffers as a result since it fails to achieve the "critical mass" needed to establish the region as a recognized center of research excellence that would lead to higher levels of venture capital activity and new business formation. In so far as possible, efforts need to be made to provide linkages between the region's many research endeavors so that those people and institutions doing research may find ways to join forces on common technologies and focus on shared goals. The lack of focus on the part of the area's research assets helps to account for the below average level of entrepreneurial activity in Hampton Roads (ODU 2000).

Finally, the region's institutions of higher education conduct research of good quality and considerable importance. Unfortunately, many of those activities and capabilities are little known to members of the business community and the public in general. This lack of visibility on the part of the region's colleges and universities works to the area's disadvantage since would-be entrepreneurs are unaware of the opportunities that they have to turn to academic specialists for advice, assistance, and joint venturing.

CONSIDERATIONS SURROUNDING THE DEVELOPMENT OF ENTREPRENEURSHIP PROGRAMS

While the level of entrepreneurial activity is currently at modest levels, the good news for Hampton Roads is that developing an entrepreneurial climate will tend to set off a chain of events that will become self-reinforcing with the passage of time so that small efforts have the potential to have large results in the long run. In effect, once entrepreneurial activity has begun in a community, it tends to

persist and accelerate. This self-reinforcing process occurs because entrepreneurs tend to start businesses related to what they did before they began their businesses and in the location where they live currently. This tendency of entrepreneurs to go into business close to home results from the fact that individuals accumulate local knowledge about their industry within their own region. And because entrepreneurs rarely change location once their firm is established, regions with high levels of entrepreneurial activity tend to continue to generate other new firms which spawns further entrepreneurial activity. Furthermore, this self-reinforcing process is helped along by the fact that research has shown parents who are entrepreneurs are likely to have children who themselves become entrepreneurs a generation later (OECD 1998). For these reasons and more, creating an entrepreneurial environment can, an frequently does, become a self-reinforcing process (Malecki 1997).

Designing an entrepreneurial program for Hampton Roads will not be easy. Over the years, given the need to further develop state and local economies and the potential for the growth of small, rapidly expanding businesses to spur economic growth, many programs have been created to foster additional entrepreneurial activity. These programs are gaining acceptance and have become an important component in local economic development efforts. Because the encouragement of entrepreneurship is unlikely to yield major benefits in the short-run, these programs have typically been structured with an eye to improving the economy in the longer term.

Issues abound surrounding the development of a program to promote regional entrepreneurship. One concern has to do with the need and difficulty of finding ways to focus on entrepreneurs to the exclusion of non-entrepreneurial small businesses. Because of this difficulty, the tendency of communities has been to implement programs that promote the development of all small businesses while recognizing that not all small businesses are entrepreneurial. Unfortunately, failing to more precisely focus these programs has reduced their impact. Further reducing the success of these efforts has been the fact that each year small firms eliminate nearly as many jobs as they create thus limiting the value of these programs to the community.[43] Additionally, many of these programs have yielded limited benefits to their local areas since the majority of new businesses fail while many of those that survive do not grow (Maliza 1999).[44]

Programs designed to promote the development of entrepreneurial firms can benefit from having the capacity to cull out those businesses which have the ability to achieve rapid and sustained growth to the exclusion of other, less

[43] One estimate is that from 50 to 90 percent of new enterprises fail within their first three to five years of operation (Koven 2003).

[44] The impact of new businesses can be further reduced by the fact that a portion of their increase in employment and sales may come at the expense of other area businesses. This is referred to as the "displacement effect."

dynamic firms.[45] Any program, which is not able to focus on those small businesses with the potential for significant growth, may not be doomed to fail but is likely to yield low rates of return. Stated differently, because of the limited growth potential of most new businesses, economic development strategies which focus largely on the development of small businesses without identifying firms with high growth potential may experience limited success. That said, it should be recognized that it has always been hard to identify "winners" among the many new and young business firms suggesting to some that programs should instead focus on the creation of a local business environment favorable to businesses of all ages and sizes rather than concentrating on small or entrepreneurial businesses alone (Malizia 1999).[46]

Even where programs have focused on the promotion of rapidly growing firms and appear to have produced good results, they may simply have fostered entrepreneurial activity among persons who would have become entrepreneurs without any outside help. This has caused some to suggest that economic development programs should be designed to encourage those persons with the least likelihood to become entrepreneurs (Malizia 1999).

While much attention has been given to promoting the small business sector, it may be that the most successful programs will be those that target the development of entrepreneurial firms, regardless of their size. These programs can avoid the pitfall of devoting resources to small firms with little or no growth potential.

No program is without its risks since, if successful, the entrepreneurial firms that are generated may merge with others and move to the location of the acquiring company or move away from their home of origin as they expand to locations with operational advantages not possessed at home.

Finally, as the region considers ways to generate an increased level of new business startups, it must recognize that some of the more important determinants of entrepreneurship can not be impacted by direct regional or local action. Some of the more important of those determinants are the size of the private sector relative to the size of the economy overall, the composition of the region's sector mix, the region's branch plant orientation, the basic demographic characteristics of the population, and the level of relative wages. Each of these factors plays a critical role in determining the level of entrepreneurial activity in the region and is not likely to be significantly impacted by local actions or programs. Instead, the region must construct a program composed of actions that can be taken that will directly effect the lives and business prospects of

[45] Some argue against promoting local entrepreneurial activity entirely given the low survival rate of new firms. Instead, they argue for encouraging the growth of existing firms, especially the small number that have managed to achieve high growth rates.
[46] Some regard entrepreneurial business development as a high-risk, high-reward strategy (Malizia 1999).

individual entrepreneurs. Examples of such actions include the creation of additional venture capital and angel financing, an expansion of business incubation activities, entrepreneurial education programs, inexpensive business counseling services, mentoring and networking programs, and actions which will aid entrepreneurs in the identification of new business opportunities.

An enumeration of techniques that have been incorporated into various state, regional, and local entrepreneurial programs are contained in **Appendix B**. A scan of entrepreneurial opportunities in Hampton Roads is contained in **Appendix C**. The intent of this scan is to suggest avenues which can be pursued by area entrepreneurs as they prospect for new business opportunities in the region.

CONCLUSION

This report has made four assessments about entrepreneurial activity in Hampton Roads. The first led to a description of the role that entrepreneurs and the small business sector play in the nation's economy. Entrepreneurs and small businesses were judged to contribute importantly to the economy but recent research points to the significant role also being played by larger firms as well as gazelles. Second, the report used both direct and indirect methods to measure the degree of entrepreneurial activity in the region. Those assessments point to a regional economy that does not rely as heavily on entrepreneurial activity and small businesses as much as the majority of other metropolitan areas. Third, this report attempted to explain why entrepreneurial activity is under represented locally. A multitude of socio-economic factors were found to contribute to this under representation – many of which were beyond regional control or influence. Finally, an effort was made to suggest sectors within which area entrepreneurs may find opportunities for business expansion and new enterprise formation.

Because of the need to increase the amount of entrepreneurial activity in the region, a companion document will soon be published which will offer specific recommendations for regional action. This document will be designed to serve as a capstone report for all of the work done as a part of a research grant provided by the Office of Economic Adjustment. As a result, it will not only offer recommendations on enhancing the level of entrepreneurial activity in the region but will also suggest ways in which to strengthen the existing business base as well. Further recommendations will be offered as to ways in which the overall competitiveness of the regional economy can be increased.

APPENDICES

APPENDIX A

A Comparison of U.S. Payroll and Nonpayroll Establishments by Sector

	Number of Establishments			Establishments Without Payroll as a Percent of all Establishments
	With Payroll	Without Payroll	Total	
Utilities	18,594	12,675	31,269	40.5%
Construction	697,514	2,071,317	2,768,831	74.8%
Manufacturing	344,188	290,380	634,568	45.8%
Wholesale Trade	438,301	363,781	802,082	45.4%
Retail Trade	1,115,092	1,838,992	2,954,084	62.3%
Transportation and Warehousing	200,706	808,999	1,009,705	80.1%
Information	137,276	232,698	369,974	62.9%
Finance and Insurance	449,134	660,292	1,109,426	59.5%
Real Estate and Rental and Leasing	325,590	1,880,042	2,205,632	85.2%
Professional, Scientific, and Technical Services	778,612	2,552,880	3,331,492	76.6%
Administrative/Support/Waste Management/Remediation	335,088	1,262,707	1,597,795	79.0%
Educational Services	50,006	344,538	394,544	87.3%
Health Care and Social Assistance	707,519	1,456,915	2,164,434	67.3%
Arts, Entertainment, and Recreation	111,128	865,990	977,118	88.6%
Accommodation and Food Services	562,059	241,688	803,747	30.1%
Other Services (except public administration)	539,476	2,459,409	2,998,885	82.0%

APPENDIX B

SELECTED TECHNIQUES USED TO FOSTER REGIONAL ENTREPRENEURIAL ACTIVITY

The discussion to follow outlines selected strategies which have become popular among communities/states attempting to enhance area entrepreneurial activity. Most of these techniques are designed to create a supportive environment within which entrepreneurs can thrive as opposed to providing them with direct financial aid. In essence, these strategies attempt to create an "entrepreneur-friendly" environment so that a higher fraction of an area's population will be enticed to start new businesses, especially those which take an innovative approach to meeting market demands using high technology methods and materials.

Some of the most commonly used techniques for enhancing entrepreneurial activity are describes below.

Entrepreneurial Education

Not all would-be entrepreneurs possess the requisite skills to succeed in building a business.[47] Many entrepreneurs are technologists and are not trained in such basic skills as marketing, finance, personnel, and business management. As a result, in many cases, because of their lack of exposure to business topics, they are unaware of what they do not know and what their information needs are. However, and perhaps contrary to popular opinion, entrepreneurship can, to a large degree, be fostered by teaching the skills that are needed by those starting new businesses. Those skills include how to recognize opportunities, how to develop a business plan and marshall the resources required by a new business, and how to operate a business venture once an enterprise has been created. Most, if not all of these skills, can be taught at the secondary and college/university levels. In fact, research done at Babson College and Harvard University indicate that the pace of business creation on the part of their students is correlated with the number of small business classes taken (OECD 1998).

Colleges and universities can play an especially strong role in the business education process by creating entrepreneurship centers supported by endowed chairs in entrepreneurial education. Furthermore, these institutions can perform as "talent magnets" when they combine studies in science and engineering with additional coursework on how to use those skills to form new

[47] One study done in Canada found that thirty-five percent of potential new business owners believe that they would benefit from practical advice about how to organize and run a new business.

businesses. Unfortunately, while four-year institutions have embraced entrepreneurial instruction, many community colleges have not. At present, only 9 percent of the more than one thousand community colleges offer courses on entrepreneurship (Pages 2003).

A byproduct of a training program for entrepreneurs can be to make students aware that entrepreneurship is one of many options, which they may pursue as a career choice. Fortunately, interest in learning about the world of small business is generally good since surveys done of American youth consistently indicate that students have a strong desire to learn about and even pursue an entrepreneurial career.

Creating entrepreneurial educational programs has not always been easy.[48] While states have often expressed support for setting up education programs to further entrepreneurship, few have devoted sufficient financial support to achieve demonstrable results. In addition, support for business programs at the K-12 level has been decidedly limited since teachers, administrators, and superintendents are faced with an already crowded set of skills which they need to impart to students making it difficult to convince them of the need to include entrepreneurial training in the curriculum (Pages 2003, NGA Center for Best Practices 2004).

Entrepreneurial Culture

Attitudes toward entrepreneurship vary across places and cultures. Places like Boston, Austin, and Silicon Valley have long been held up as examples of communities where conditions are right for the development of new businesses – especially high-tech ventures.

Much has been written about creating a nurturing environment for entrepreneurs but there is little evidence as to how successful these efforts have been. In fact, there is the very real likelihood that the results achieved have been modest at best and have come at a cost of much time and effort.

One approach to fostering a more entrepreneurial environment has been to offer academic and non-academic coursework on small business. However, this approach has been criticized by some who argue that the presence of entrepreneurial course, while increasing the number of persons exposed to entrepreneurship, do not significantly raise the percentage of the student body that ultimately start new businesses. Others contend that entrepreneurial coursework simply benefit those who would have become entrepreneurs anyway, rather than changing the percentage of students opting to create a new business.

[48] The Internet may be making this educational process somewhat easier since instructional programs and information can be made available to would-be entrepreneurs remotely. In addition, bookstores and libraries are increasingly offering “how-to” books on entrepreneurial topics.

However, to the extent that a region can foster a culture that honors and rewards entrepreneurial efforts through academic programs, the overall level of entrepreneurial activity should rise (OECD 2003).

Efforts to promote the development of an entrepreneurial culture have been highly creative. Some make efforts to work through the mass media – others place a strong emphasis on education and training. Still other programs include business plan competitions with prizes going to various categories of winners (exporters, women, minorities, business sectors, etc.). And finally, other programs stress networking, the formation of entrepreneurial clubs, and media events such as public award ceremonies.

Entrepreneurial Networks

In a wide variety of human endeavors, networking is vital to the exchange of ideas and information. Entrepreneurship is no exception. Networking among entrepreneurs not only facilities the exchange of information but also helps them to keep abreast of developments in their field, introduces them to potential customers, clients, and partners, and helps them to gain access to a wider variety of available services. As a result, entrepreneurs who participate in one or several networks tend to outperform those who do not.[49] Communities and states can support the development of these networks by holding luncheons, training sessions, and achievement award events for selected firms, individuals, and representatives of area governments.

Access to Capital

Acquiring debt funding has always been especially difficult for new business startups. Large firms have typically been in a relatively strong position to finance their operations. Not only do they have access to retained earnings generated through company operations but they can also secure external financing at attractive interest rates. By contrast, small firms and business startups have greater difficulty in gaining access to affordable credit. The primary source of this difficulty is that lending to small business is generally considered to be riskier than lending to more established enterprises whose record of success is well known and thoroughly documented.[50] The sensitivity of small businesses to swings of the business cycle along with their higher rates of failure further adds to the perception, if not the reality, that lending to new and small business ventures is risky.

In addition, lenders have historically found it difficult to determine the creditworthiness of small businesses. This stems from the fact that small firms

[49] One study done in Canada found that the self-employed who participate in various forms of associations earned forty percent more than did non-joiners (OECD 2004).
[50] A small business needs about six years of operation before it becomes stable with good long-term prospects (Lyons 2001).

are very heterogeneous so that it has not been easy to develop standards for assessing the strength of applications made by firms. A further difficulty arises from the fact that obtaining reliable information on small businesses has never been easy since little public information exists about the performance of most small businesses. And in the case of business startups, no track record exists. A related issue is that small businesses frequently lack detailed balance sheets and other financial documents that help lenders to make underwriting decisions. Finally, many small firms lack the ability to provide significant collateral to secure financing so that loans must be made on the basis the personal credit history of the borrower (Board of Governors of the Federal Reserve Bank 2002).

Not only is the supply of capital a problem for many small businesses, but demand for capital is also an issue. A shortage of demand frequently results from a lack of knowledge of funding sources and opportunities. One study done in Canada showed that a high proportion of small business owners were unaware that equity markets exist. Furthermore, venture capitalists often demand a significant stake in a firm as a requirement for lending. Because many entrepreneurs are averse to surrendering even minimal control of their enterprise, venture capital financing is effectively not available to many. This is especially a concern for family-owned businesses. As a result, many small businesses are undercapitalized which increases their level of risk. A greater willingness to work with venture capitalists would facilitate the growth and likely success of many small businesses (OECD 2004).

The sources of new business financing can be confusing given the bewildering arrays of options which are available.

Typically, the first task for each would-be entrepreneur has been to acquire equity capital. Without it, discussions of securing debt are not possible. Initial efforts to raise equity for a new business typically include tapping savings accounts, obtaining a second mortgage or a home equity loan, borrowing from friends and relatives, and using credit cards.

Two other sources of non-debt financing include angel and venture capital. Of these, angel capital is becoming increasingly important although reliable statistics are scarce. Unfortunately, the market for these funds is fragmented and localized. Angels are individuals who, either on their own or operating within a network, invest in new or growing businesses. They are typically successful entrepreneurs and are widely dispersed throughout the nation. Under normal circumstances they supply funding to business startups, and they may provide hands-on assistance and advice. Today, there are more than 3 million angels who invest more than $50 billion in new companies each year. The investments made by these investors dwarf conventional seed and venture capital funding as the primary source of startup and early-stage capital

(OECD 2004).[51] While these figures are significant, angel financing can be difficult to locate and each investor controls only limited resources. It is for this reason that states and regions have attempted to organize angels into networks that can combine their efforts to make larger loans and to enable them to diversify their portfolios.

Other forms of equity capital, irrespective of the loan source, are seed capital, pre-venture, and venture capital. Seed capital provides money to a startup business to overcome the initial hurdles of forming a new business. Funding is generally provided in the range of $30,000 to $300,000 with a term of approximately five years. Because of the high risks involved in seed capital lending, rates of return on investment are expected to be high – frequently in the range of prime plus ten percent. Pre-venture capital is used to finance research and development at the product development stage. Pre-venture capital investments are often riskier than venture capital investments since there is no guarantee that a successful product will ultimately be developed. Finally, venture capital investments are typically much larger starting at $1,000,000 and going higher. Rates of return of 100 percent over three years are often required to compensate for the high risks being taken by investors. Sources of venture capital funds have expanded over the years (Lyons 2001).[52]

The involvement of the public sector in financing has become increasingly important. In some cases, states have provided financing by making both debt and equity investments in entrepreneurial firms. In other cases, states have invested in venture capital partnerships in an effort to encourage those firms to invest funds in opportunities within the state. Unfortunately, venture capital firms are concentrated in just a few, economically dynamic regions leaving large areas of the country underserved.[53] Also, while formal venture capital funding is relevant for only a small minority of firms, they account for a disproportionately large role in small firm job creation (OECD 2004).

As with equity funding, debt financing is available from a variety of sources. Of these, banks are the largest provider of funds to small businesses (Appalachian Regional Commission 2000). Aside from banks, perhaps the best known providers of debt capital is the U.S. Small Business Administration (SBA). Loan programs of special note are the 7(a) Loan Guaranty Program, the 7(m)

[51] Seed capital is a subset of venture capital. It includes funding from professionally managed investment partnerships that specialize in providing capital for young, early-stage companies.

[52] An important factor contributing to the development of venture capital was a change in the rules regarding pension fund investing in the late 1970s. This change allowed them to undertake higher-risk investments including venture capital financing. As a result, pension funds have become the largest source of venture capital funding accounting for nearly half of those funds in 1996 (OECD 1998).

[53] In general, angel capitalists make smaller capital investments than venture capitalists and are less concerned about participating in the management of the firms in which they invest. Angel capitalists also tend to demand a smaller equity share in each business than venture capitalists (Koven 2003).

Microloan Program, 504 Certified Development Companies, and the Certified and Preferred Lenders Program (Koven 2003). One of the SBA's programs makes more than 65,000 business loans per year (Pages 2004).

A final source of funding for small entrepreneurial firms is microenterprise lending which focuses on lending only to entrepreneurs who cannot get capital anywhere else because of poor credit or lack of collateral. This form of lending is exceedingly expensive due to the high transaction costs of making such loans. These programs are designed to provide help to poor persons who have the desire, but not the capital, to start their own business. Given their mission, these programs lend based upon both the economic prospects for the firm as well as upon issues of social welfare. Recipients of loans are frequently women, displaced wage-earners, the unemployed, and members of a minority group.

A further effort to increase the availability of capital to small firms has been the creation of tax credits. Credits have been targeted to individuals who invest directly in business ventures or supply funds to certified seed and venture capital pools.[54] Tax breaks are a controversial mechanism for raising capital since there is never any guarantee that the capital freed up by the tax credit is invested in the state (Rubel 2000).

Fortunately, the many efforts which have been made over the years to provide funding for new firms has made a difference so that entrepreneurs are better able to acquire capital today than formerly. This was confirmed by a survey done by the National Federation of Independent Business which showed that obtaining financing was of relatively low importance to entrepreneurs when compared to the many other hurdles that they face. In fact, the problem of obtaining short and long-term financing ranked only 63rd and 64th, respectively, in 1996 among all of the concerns expressed in the survey (OECD 1998).

SBA Business Development Assistance

While not strictly a tool used by local governments to foster additional entrepreneurial activity, the Small Business Administration operates small business development centers (SBDCs) and business information centers (BICs) which can complement local efforts. The first of these, SBDCs, are essentially one-stop-shopping facilities for all types of management and technical information and business assistance. Most are located on the campuses of community colleges or universities. The second, BICs, are also supported by the SBA. They operate like SBDCs in that they provide technical information but they also offer the services of volunteers from the Service Corps of Retired Executive referred to as SCORE. SCORE has thousands of former

[54] In addition to creating tax breaks to encourage capital formation, other tax breaks are designed to help technology-based businesses fund research and development. These credits have little value to young firms which have only limited tax liabilities.

businesspeople who offer their expertise across a wide range of business specialties to small businesses that need outside help (Koven 2003).

Finally, in 1958, the U.S. Congress created the Small Business Investment Corporation (SBIC) program. SBICs are privately owned, most commonly, by small groups of local investors. They provide diverse forms of financing including venture capital and long-term loans to meet a wide variety of needs and only invest in qualifying small businesses as determined by the Small Business Administration.

Business Incubators

Business incubation has a long history in the United States. The first incubator was opened in 1958. Today, according to the National Business Incubation Association (NBIA), there are about one thousand incubators in North America, up from 12 in 1980. The vast majority of these have been set up as nonprofit organizations.

According to NBIA, the function of an incubator is to nurture the development of entrepreneurial companies – especially during the start-up period when they are most vulnerable and likely to fail.[55] Their goals are to do such things as create jobs for the local area, enhance the local entrepreneurial climate, retain businesses that might be inclined to relocate, and diversify the local economy while accelerating its rate of growth. Incubators provide aid to their clients by making available a comprehensive set of services tailored to meet the needs of new firms that may lack the resources and time to acquire the basics for their operations. In essence, incubators provide, in one location and from one source, a wide range of support services at reasonable costs.[56]

Traditional incubators are buildings that house new businesses under one roof. They provide their clients with flexible space at affordable rents, shared business services, training and coaching, financial assistance, and the opportunity to network.[57] In some cases, the space provided is among the only available since many property owners are reluctant to lease space to business startups which have little or no record of success. They are frequently referred to

[55] The Small Business Administration administers Small Business Development Centers. These Centers differ from business incubators in that they do not specifically target early-stage companies which are typically the focus of incubators.

[56] Joint services are set up to reduce start-up overhead. They include such things are reception services, clerical assistance, use of basic equipment ranging from fork lifts to fax machines, printing and copying services, security services, laboratory and kitchen facilities, office furniture rental, common conference and lunch rooms, and bookkeeping services.

[57] Early incubators were set up to charge below-market rents so as to lower the overhead costs faced by fledgling businesses. However, as the value of the services provided by incubators were realized, they were able to raise their rents to and above market rates. Because of the cost associated with running incubators and the scarcity of funding, sponsors began to require that rents be set at or near the market for comparable space.

as residential incubators since their client businesses are in residence in the incubator facility. This is in contrast to virtual incubators which have no physical space but instead link businesses and service providers which are spatially dispersed (Koven 2003).

Incubators differ in the nature of the clients that they serve. According to a survey conducted by the NBIA, the majority of incubators assist a wide mix of firms while 37 percent focus on technology businesses alone. Others focus on manufacturing firms (7 percent) and service businesses (6 percent).

Most incubator programs claim to have been successful and can point to client firms which have "graduated" and become self-sustaining firms.[58] However, while much literature exists on how to start and manage incubators, few methodologically-sound studies have been done to determine their impact. Instead, the literature tends to be promotional in nature and offers only limited insight into the impact of incubator programs. Perhaps the greatest difficulty in assessing the success of incubators is that is it not easy to determine which of the incubator graduates would have been able to become going concerns without incubation (OECD 2004).

Unlike incubators which have been designed to aid in the promotion of entrepreneurial activity, science parks have been created to accommodate already established businesses. Many occupants of such parks come from beyond a region's borders and have little connection to area entrepreneurial activity. Most parks are linked to regional research facilities and have been supported by regional and local authorities through the provision of land and infrastructure, tax breaks, and other incentives. The failure rate of science parks has been high with approximately half of all parks closing (OECD 1998).[59]

[58] A survey done in western Germany found that nearly ninety percent of the firms in business incubators considered the space and help they received from their incubators to have played a significant role in their development (OECD 2003).

[59] Even the highly regarded Research Triangle Park in North Carolina took more than a decade to become viable. The cost to the state was considerable.

APPENDIX C

PROSPECTING FOR ENTREPRENEURIAL OPPORTUNITIES IN HAMPTON ROADS

Entrepreneurs typically find new business startup opportunities within those sectors for which they have the most knowledge and in locations that are familiar to them. However, finding untapped markets for new products/processes is not always easy. In an effort to suggest where opportunities may lie for area would-be entrepreneurs, a scan of sectors has been performed in order to identify new business development opportunities in Hampton Roads.

In executing this scan, the region's imports and exports were examined since the presence of regional imports and exports is indicative of two important types of demand, and therefore opportunities, in the region. The first source of demand is imports. Those sectors importing large quantities of goods and services from outside the region are likely to offer opportunities to substitute regional production for those things currently being imported. The other source of demand is exports. Those sectors exporting their output suggest where the region has a comparative advantage that new businesses may be able to exploit to their benefit.

The trading pattern of local sectors was determined from data found in the Commission's Implan model. This model was acquired from the Minnesota IMPLAN Group, Inc. and is a regional input-output model that is widely used in the U.S. to do state, regional, and local economic impact analyses. The model's extensive database with its information on the region's imports and exports was used to identify new business opportunities.

Implan's estimates of the largest regional markets for both imports and exports are listed in Table 1. A complete listing of import and export markets for all of the region's sectors is contained in Table 2. The data in both tables are ranked according to the sum of regional imports and exports since entrepreneurs may wish to tap into either or both of those markets. The data in the table suggest that opportunities exist to either substitute the region's products and services for those which have historically been imported or to serve non-regional markets through the process of exporting. In order to assist in the identification of the location of each of these markets, both imports and exports have been disaggregated into sub markets. Imports have been separated into imports used in the production of regional output as well as into imports for consumption by

end users. By contrast, exports have been divided into exports destined for the domestic or U.S. market and those exports going to foreign markets.[60]

The nature of the data in the table is best explained through use of an example. One of the better opportunities for area entrepreneurs may lie in the architectural and engineering (A&E) sector. As can be seen in Table 1, the region exports very little in the way of architectural and engineering services with most destined for foreign markets. The dollar value of those exports is only $45.5 million – small by comparison to the value of imports. By contrast, the area appears to offer a significant opportunity to new architectural and engineering firms since the region imports nearly $1.4 billion of services from A&E companies located outside the region. Much of those services ($332.8 million) are used in the process of generating other products and services but the larger share is used by final users – more than likely the armed forces and assorted federal agencies. Substituting locally generated architectural and engineering services for comparable services from elsewhere may represent an opportunity for area entrepreneurs. Other sectors, which appear to offer important import substitution opportunities are management consulting, legal services, custom computer programming, and data processing. Imports are large in each of these sectors, especially when compared to exports.

Appendix C - Table 1: Select Hampton Roads Import and Export Markets
2002
Millions of Dollars

	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Ship building and repairing	$136.1	$2,476.7	$2,612.8	$40.5	$1,028.9	$1,069.4	$3,682.1
Real estate	$4.4	$1,904.8	$1,909.2	$709.5	$520.4	$1,229.8	$3,139.0
Automobile and light truck manufacturing	$267.6	$1,159.7	$1,427.3	$0.0	$1,685.4	$1,685.4	$3,112.6
Architectural and engineering services	$45.5	$0.0	$45.5	$332.8	$1,049.2	$1,382.1	$1,427.6
Motor vehicle parts manufacturing	$198.8	$220.3	$419.1	$920.2	$64.3	$984.6	$1,403.7
Monetary authorities and depository credit inter	$64.1	$412.3	$476.5	$214.6	$522.1	$736.7	$1,213.2
Insurance carriers	$10.5	$235.2	$245.7	$355.7	$476.7	$832.3	$1,078.0
Hospitals	$0.1	$780.9	$781.0	$0.0	$264.9	$264.9	$1,046.0
Lessors of nonfinancial intangible assets	$287.6	$591.4	$879.0	$92.0	$0.0	$92.0	$971.1
Food services and drinking places	$2.5	$656.2	$658.7	$27.5	$184.9	$212.4	$871.0
Animal- except poultry- slaughtering	$160.8	$627.5	$788.3	$16.4	$17.9	$34.3	$822.6
Management of companies and enterprises	$106.5	$431.7	$538.1	$241.8	$0.0	$241.8	$779.9
Cable networks and program distribution	$0.0	$485.0	$485.0	$110.5	$177.8	$288.3	$773.3
Telecommunications	$14.5	$11.5	$26.0	$305.8	$397.2	$703.1	$729.1
Pharmaceutical and medicine manufacturing	$0.3	$0.0	$0.3	$81.5	$599.6	$681.2	$681.4
Scenic and sightseeing transportation and supp	$85.3	$335.7	$421.0	$171.7	$80.5	$252.2	$673.2
Other computer peripheral equipment manufac	$255.6	$0.0	$255.6	$37.7	$340.5	$378.2	$633.8
Management consulting services	$3.5	$0.0	$3.5	$281.4	$299.8	$581.2	$584.7
Colleges- universities- and junior colleges	$2.1	$392.5	$394.5	$11.9	$127.6	$139.4	$533.9
Securities- commodity contracts- investments	$21.4	$0.0	$21.4	$294.4	$217.0	$511.4	$532.8
Cut and sew apparel manufacturing	$2.8	$0.0	$2.8	$10.0	$492.3	$502.4	$505.1
Oil and gas extraction	$0.0	$0.0	$0.0	$483.9	$0.0	$483.9	$483.9
Air transportation	$61.9	$0.0	$61.9	$113.0	$244.5	$357.5	$419.4
Petroleum refineries	$24.7	$0.0	$24.7	$139.6	$245.3	$384.8	$409.5
Business support services	$1.0	$329.1	$330.1	$57.1	$11.6	$68.7	$398.9
Legal services	$8.9	$0.0	$8.9	$189.9	$182.3	$372.2	$381.1
Custom computer programming services	$12.2	$69.2	$81.4	$13.7	$278.9	$292.6	$374.0
Power generation and supply	$1.7	$0.0	$1.7	$167.4	$196.6	$364.0	$365.7
Data processing services	$0.9	$119.3	$120.3	$175.0	$67.3	$242.3	$362.6

[60] The table does not show self-supply production or current regional production going to meet regional demand. The amount of production designated for self-supply can be defined to be total output minus regional exports. Self-supply is simply local production consumed locally.

Appendix C - Table 2: Hampton Roads Import and Export Markets

2002

Millions of 2005 Dollars

	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Ship building and repairing	$136.1	$2,476.7	$2,612.8	$40.5	$1,028.9	$1,069.4	$3,682.1
Real estate	$4.4	$1,904.8	$1,909.2	$709.5	$520.4	$1,229.8	$3,139.0
Automobile and light truck manufacturing	$267.6	$1,159.7	$1,427.3	$0.0	$1,685.4	$1,685.4	$3,112.6
Wholesale trade	$273.0	$378.2	$651.2	$667.7	$742.9	$1,410.6	$2,061.8
Architectural and engineering services	$45.5	$0.0	$45.5	$332.8	$1,049.2	$1,382.1	$1,427.6
Motor vehicle parts manufacturing	$198.8	$220.3	$419.1	$920.2	$64.3	$984.6	$1,403.7
Monetary authorities and depository credit inte	$64.1	$412.3	$476.5	$214.6	$522.1	$736.7	$1,213.2
Insurance carriers	$10.5	$235.2	$245.7	$355.7	$476.7	$832.3	$1,078.0
Hospitals	$0.1	$780.9	$781.0	$0.0	$264.9	$264.9	$1,046.0
Lessors of nonfinancial intangible assets	$287.6	$591.4	$879.0	$92.0	$0.0	$92.0	$971.1
Food services and drinking places	$2.5	$656.2	$658.7	$27.5	$184.9	$212.4	$871.0
Animal- except poultry- slaughtering	$160.8	$627.5	$788.3	$16.4	$17.9	$34.3	$822.6
Management of companies and enterprises	$106.5	$431.7	$538.1	$241.8	$0.0	$241.8	$779.9
Cable networks and program distribution	$0.0	$485.0	$485.0	$110.5	$177.8	$288.3	$773.3
Telecommunications	$14.5	$11.5	$26.0	$305.8	$397.2	$703.1	$729.1
Pharmaceutical and medicine manufacturing	$0.3	$0.0	$0.3	$81.5	$599.6	$681.2	$681.4
Scenic and sightseeing transportation and sup	$85.3	$335.7	$421.0	$171.7	$80.5	$252.2	$673.2
Other computer peripheral equipment manufa	$255.6	$0.0	$255.6	$37.7	$340.5	$378.2	$633.8
Cattle ranching and farming	$0.0	$0.0	$0.0	$615.2	$1.6	$616.8	$616.8
Management consulting services	$3.5	$0.0	$3.5	$281.4	$299.8	$581.2	$584.7
Colleges- universities- and junior colleges	$2.1	$392.5	$394.5	$11.9	$127.6	$139.4	$533.9
Securities- commodity contracts- investments	$21.4	$0.0	$21.4	$294.4	$217.0	$511.4	$532.8
Cut and sew apparel manufacturing	$2.8	$0.0	$2.8	$10.0	$492.3	$502.4	$505.1
Oil and gas extraction	$0.0	$0.0	$0.0	$483.9	$0.0	$483.9	$483.9
Air transportation	$61.9	$0.0	$61.9	$113.0	$244.5	$357.5	$419.4
Petroleum refineries	$24.7	$0.0	$24.7	$139.6	$245.3	$384.8	$409.5
Business support services	$1.0	$329.1	$330.1	$57.1	$11.6	$68.7	$398.9
Legal services	$8.9	$0.0	$8.9	$189.9	$182.3	$372.2	$381.1
Custom computer programming services	$12.2	$69.2	$81.4	$13.7	$278.9	$292.6	$374.0
Power generation and supply	$1.7	$0.0	$1.7	$167.4	$196.6	$364.0	$365.7
Data processing services	$0.9	$119.3	$120.3	$175.0	$67.3	$242.3	$362.6
Postal service	$2.2	$271.8	$274.0	$55.6	$25.0	$80.6	$354.6
Nondepository credit intermediation and relat	$0.0	$143.0	$143.0	$187.7	$12.3	$200.0	$343.1
Advertising and related services	$2.5	$101.3	$103.7	$226.4	$12.7	$239.1	$342.8
Plastics material and resin manufacturing	$81.1	$172.3	$253.3	$81.7	$1.3	$83.0	$336.3
Electronics and appliance stores	$0.0	$0.0	$0.0	$34.3	$290.4	$324.6	$324.6
Insurance agencies- brokerages- and related	$0.0	$119.2	$119.2	$197.7	$0.0	$197.8	$317.0
Electronic computer manufacturing	$129.6	$0.0	$129.6	$18.1	$143.8	$161.9	$291.4
Coffee and tea manufacturing	$18.2	$250.8	$269.0	$1.7	$5.0	$6.7	$275.7
Turbine and turbine generator set units manufa	$3.5	$0.0	$3.5	$248.9	$19.5	$268.5	$272.0
Water transportation	$144.1	$0.0	$144.1	$3.9	$119.8	$123.7	$267.8
Commercial printing	$8.5	$97.6	$106.2	$131.1	$29.3	$160.3	$266.5
Paperboard container manufacturing	$5.6	$136.3	$141.9	$117.3	$5.8	$123.2	$265.1
Iron and steel mills	$0.2	$0.0	$0.2	$260.8	$1.3	$262.1	$262.3
Food and beverage stores	$0.0	$0.0	$0.0	$39.4	$214.7	$254.1	$254.1
Soft drink and ice manufacturing	$0.6	$74.7	$75.4	$27.7	$150.7	$178.4	$253.8
Other new construction	$0.0	$0.0	$0.0	$0.0	$251.3	$251.3	$251.3
Paper and paperboard mills	$0.7	$8.3	$9.0	$170.9	$65.1	$236.0	$245.1
Plastics plumbing fixtures and all other plastics	$13.4	$0.0	$13.4	$197.7	$33.1	$230.8	$244.2
Computer systems design services	$7.5	$104.5	$112.0	$43.2	$88.2	$131.4	$243.3
Other computer related services- including fac	$2.5	$0.0	$2.5	$54.6	$181.4	$236.1	$238.5
Software publishers	$5.0	$38.3	$43.3	$93.6	$94.9	$188.5	$231.9
Truck transportation	$33.5	$0.0	$33.5	$118.8	$74.5	$193.3	$226.9
Employment services	$0.4	$78.4	$78.8	$131.3	$15.2	$146.5	$225.3
Semiconductors and related device manufacti	$87.8	$74.4	$162.3	$57.2	$0.9	$58.2	$220.4
All other miscellaneous professional and techr	$0.1	$0.0	$0.1	$91.9	$124.4	$216.4	$216.4
Animal production- except cattle and poultry a	$0.8	$0.0	$0.8	$204.3	$9.8	$214.1	$214.9
Hotels and motels- including casino hotels	$0.0	$130.2	$130.2	$23.1	$57.7	$80.7	$210.9
Natural gas distribution	$0.3	$0.0	$0.3	$71.2	$139.2	$210.4	$210.7
Book publishers	$8.7	$85.0	$93.7	$18.1	$95.7	$113.8	$207.4
Funds- trusts- and other financial vehicles	$0.0	$0.0	$0.0	$3.6	$202.7	$206.4	$206.4

Appendix C - Table 2: Hampton Roads Import and Export Markets Con't

2002

Millions of 2005 Dollars

	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Services to buildings and dwellings	$0.3	$89.3	$89.6	$69.1	$45.2	$114.4	$204.0
Ready-mix concrete manufacturing	$0.0	$61.2	$61.2	$128.7	$1.2	$129.8	$191.0
Periodical publishers	$4.4	$96.7	$101.1	$32.6	$54.1	$86.7	$187.8
Information services	$0.0	$24.0	$24.1	$83.3	$80.3	$163.6	$187.7
Fruit and vegetable canning and drying	$1.0	$20.4	$21.4	$29.4	$135.4	$164.8	$186.2
All other electronic component manufacturing	$12.3	$0.0	$12.3	$132.7	$38.9	$171.6	$183.9
Aircraft manufacturing	$3.4	$1.2	$4.6	$3.7	$175.1	$178.8	$183.5
Roasted nuts and peanut butter manufacturing	$8.8	$146.0	$154.7	$12.2	$16.0	$28.2	$182.9
Facilities support services	$0.0	$147.3	$147.3	$2.2	$31.6	$33.8	$181.2
Nursing and residential care facilities	$0.0	$0.0	$0.0	$0.0	$181.2	$181.2	$181.2
Commercial machinery repair and maintenanc	$0.1	$119.1	$119.2	$46.2	$7.6	$53.8	$173.0
Office administrative services	$0.0	$0.0	$0.0	$134.7	$37.8	$172.6	$172.6
Cigarette manufacturing	$0.1	$0.0	$0.1	$0.0	$171.9	$171.9	$172.0
Aluminum foundries	$0.0	$130.8	$130.8	$40.5	$0.2	$40.7	$171.5
Fabricated structural metal manufacturing	$1.5	$65.6	$67.1	$99.8	$3.7	$103.5	$170.6
Poultry processing	$0.0	$0.0	$0.0	$42.6	$127.4	$170.0	$170.0
Metal can- box- and other container manufactu	$4.9	$128.2	$133.1	$28.2	$7.9	$36.1	$169.2
Offices of physicians- dentists- and other healt	$0.0	$0.0	$0.0	$0.0	$167.6	$167.6	$167.6
Motion picture and video industries	$16.7	$0.0	$16.7	$111.2	$35.5	$146.7	$163.4
Heavy duty truck manufacturing	$0.0	$34.0	$34.0	$0.0	$124.7	$124.7	$158.7
Guided missile and space vehicle manufacturi	$0.0	$0.1	$0.1	$3.8	$154.7	$158.5	$158.6
Audio and video equipment manufacturing	$1.3	$0.0	$1.3	$28.3	$128.2	$156.5	$157.8
Other basic organic chemical manufacturing	$23.3	$15.1	$38.4	$96.5	$20.3	$116.8	$155.2
Meat processed from carcasses	$6.8	$137.3	$144.2	$2.0	$8.2	$10.2	$154.4
Toilet preparation manufacturing	$0.0	$0.0	$0.0	$9.9	$143.2	$153.1	$153.1
Travel arrangement and reservation services	$6.9	$95.6	$102.5	$32.3	$16.6	$48.9	$151.3
Motor vehicle and parts dealers	$0.0	$95.0	$95.0	$8.8	$44.0	$52.8	$147.8
Search- detection- and navigation instruments	$1.4	$0.0	$1.4	$4.2	$140.5	$144.8	$146.2
Machine shops	$0.0	$65.5	$65.5	$71.9	$7.5	$79.5	$145.0
Railroad rolling stock manufacturing	$30.9	$51.7	$82.6	$18.9	$39.2	$58.0	$140.7
Jewelry and silverware manufacturing	$1.7	$2.8	$4.6	$11.7	$122.3	$134.0	$138.6
Nonstore retailers	$0.0	$116.6	$116.6	$2.9	$16.9	$19.8	$136.4
Metal valve manufacturing	$3.7	$4.2	$7.9	$112.1	$14.0	$126.1	$134.1
Automotive repair and maintenance- except c	$0.0	$54.1	$54.1	$11.6	$65.3	$76.9	$131.0
Turned product and screw- nut- and bolt manu	$0.9	$0.0	$0.9	$125.9	$2.3	$128.2	$129.1
Broadcast and wireless communications equi	$11.1	$0.0	$11.1	$16.1	$100.5	$116.7	$127.8
Pump and pumping equipment manufacturing	$22.6	$56.1	$78.7	$22.7	$26.1	$48.8	$127.6
Abrasive product manufacturing	$13.0	$69.0	$82.1	$33.3	$11.3	$44.6	$126.7
Construction machinery manufacturing	$16.1	$32.4	$48.5	$18.1	$59.2	$77.3	$125.8
Couriers and messengers	$0.0	$0.0	$0.0	$114.2	$8.3	$122.5	$122.5
Breweries	$0.2	$13.7	$13.9	$15.1	$92.9	$108.1	$122.0
Scientific research and development services	$4.6	$18.2	$22.9	$16.4	$78.8	$95.2	$118.1
Fruit farming	$0.3	$0.3	$0.6	$64.6	$52.4	$116.9	$117.5
Doll- toy- and game manufacturing	$0.1	$2.7	$2.8	$2.2	$112.3	$114.5	$117.2
Machinery and equipment rental and leasing	$7.2	$0.0	$7.2	$97.9	$11.9	$109.8	$117.0
Museums- historical sites- zoos- and parks	$0.0	$108.8	$108.8	$0.0	$7.9	$7.9	$116.7
Social assistance- except child day care servi	$0.0	$0.0	$0.0	$0.0	$115.9	$115.9	$115.9
Frozen food manufacturing	$0.1	$4.5	$4.5	$13.3	$94.7	$108.0	$112.5
Paint and coating manufacturing	$0.6	$6.2	$6.8	$91.5	$12.4	$103.8	$110.6
Metal coating and nonprecious engraving	$0.0	$0.0	$0.0	$109.4	$0.0	$109.4	$109.4
Other ambulatory health care services	$0.0	$0.0	$0.0	$7.7	$101.6	$109.3	$109.3
AC- refrigeration- and forced air heating	$2.1	$12.2	$14.3	$77.4	$17.4	$94.9	$109.2
Sheet metal work manufacturing	$0.1	$33.3	$33.5	$70.2	$3.8	$74.0	$107.4
Curtain and linen mills	$1.9	$29.9	$31.9	$7.3	$67.0	$74.3	$106.1
Other support services	$0.1	$0.0	$0.1	$79.1	$25.7	$104.8	$104.9

Appendix C - Table 2: Hampton Roads Import and Export Markets Con't

2002

Millions of 2005 Dollars

	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Water- sewage and other systems	$0.0	$102.3	$102.3	$0.0	$0.0	$0.0	$102.3
Other engine equipment manufacturing	$8.0	$0.0	$8.0	$76.8	$17.5	$94.3	$102.3
Radio and television broadcasting	$0.0	$50.9	$50.9	$43.4	$7.3	$50.7	$101.6
Accounting and bookkeeping services	$1.6	$0.0	$1.6	$77.3	$22.5	$99.7	$101.3
General merchandise stores	$0.0	$64.2	$64.2	$7.1	$29.7	$36.8	$101.0
Footwear manufacturing	$0.0	$0.0	$0.0	$0.0	$100.4	$100.4	$100.4
Other amusement- gambling- and recreation i	$0.0	$32.8	$32.8	$0.7	$66.1	$66.8	$99.6
Elementary and secondary schools	$0.0	$65.2	$65.2	$0.0	$34.3	$34.3	$99.5
Other educational services	$0.0	$0.0	$0.0	$7.7	$91.7	$99.4	$99.4
Ferrous metal foundaries	$1.1	$40.1	$41.2	$57.6	$0.1	$57.7	$98.9
Other rubber product manufacturing	$3.4	$32.4	$35.8	$39.3	$23.3	$62.6	$98.4
Building material and garden supply stores	$0.0	$0.0	$0.0	$16.0	$81.6	$97.6	$97.6
Other basic inorganic chemical manufacturing	$27.4	$22.2	$49.6	$29.7	$17.1	$46.8	$96.4
Scales- balances- and miscellaneous general	$63.7	$0.0	$63.7	$9.4	$23.1	$32.6	$96.2
Database- directory- and other publishers	$0.6	$23.7	$24.3	$27.3	$42.8	$70.1	$94.4
Personal care services	$0.0	$76.0	$76.0	$0.4	$17.3	$17.8	$93.8
Surgical appliance and supplies manufacturin	$1.3	$0.0	$1.3	$30.0	$62.4	$92.4	$93.6
Buttons- pins- and all other miscellaneous mar	$0.2	$1.6	$1.8	$43.4	$47.5	$90.9	$92.7
Rail transportation	$15.6	$62.5	$78.2	$9.0	$5.2	$14.3	$92.4
Miscellaneous store retailers	$0.0	$0.0	$0.0	$19.8	$71.9	$91.7	$91.7
Cheese manufacturing	$0.0	$0.0	$0.0	$38.5	$53.0	$91.5	$91.5
Tire manufacturing	$0.3	$1.4	$1.7	$47.0	$42.5	$89.6	$91.2
Petrochemical manufacturing	$0.0	$14.3	$14.3	$62.8	$14.0	$76.7	$91.0
Fishing	$12.0	$0.0	$12.0	$56.2	$21.6	$77.7	$89.8
Sporting and athletic goods manufacturing	$2.5	$11.1	$13.7	$4.0	$71.1	$75.1	$88.8
Transit and ground passenger transportation	$0.0	$0.0	$0.0	$19.5	$67.6	$87.1	$87.1
Motorcycle- bicycle- and parts manufacturing	$11.3	$30.4	$41.7	$7.3	$37.6	$44.9	$86.6
Newpaper publishers	$0.2	$30.4	$30.5	$4.1	$51.3	$55.4	$85.9
Commercial and institutional buildings	$0.0	$0.0	$0.0	$0.0	$85.7	$85.7	$85.7
Waste management and remediation service	$0.0	$0.0	$0.0	$38.0	$45.7	$83.6	$83.7
Greenhouse and nursery production	$1.0	$22.1	$23.1	$17.5	$42.9	$60.4	$83.5
Air and gas compressor manufacturing	$20.8	$27.4	$48.2	$9.1	$25.8	$34.9	$83.1
Other concrete product manufacturing	$0.3	$23.2	$23.4	$58.0	$0.5	$58.4	$81.8
Seafood product preparation and packaging	$5.3	$67.6	$72.8	$5.0	$3.8	$8.8	$81.6
Spectator sports	$0.0	$0.0	$0.0	$38.4	$41.9	$80.3	$80.3
Other communication and energy wire manufa	$27.7	$36.4	$64.1	$14.6	$1.1	$15.8	$79.9
Bread and bakery product- except frozen- mar	$1.5	$0.0	$1.5	$21.1	$57.2	$78.3	$79.8
Nonchocolate confectionery manufacturing	$2.0	$33.3	$35.3	$6.5	$35.5	$41.9	$77.3
Nonupholstered wood household furniture mar	$0.8	$0.0	$0.8	$0.8	$74.8	$75.6	$76.4
Phosphatic fertilizer manufacturing	$0.0	$48.3	$48.4	$20.9	$6.8	$27.7	$76.0
Lighting fixture manufacturing	$0.0	$0.8	$0.9	$53.8	$21.0	$74.8	$75.7
Vegetable and melon farming	$0.7	$0.1	$0.8	$9.5	$63.7	$73.2	$74.0
Soap and other detergent manufacturing	$0.0	$0.0	$0.0	$7.8	$66.0	$73.8	$73.8
Environmental and other technical consulting s	$0.0	$0.0	$0.0	$42.3	$30.9	$73.2	$73.2
Plate work manufacturing	$0.0	$1.3	$1.3	$71.8	$0.1	$71.9	$73.2
Automotive equipment rental and leasing	$8.1	$0.0	$8.1	$25.6	$39.2	$64.8	$72.9
Copper rolling- drawing- and extruding	$6.4	$23.7	$30.1	$42.3	$0.2	$42.5	$72.6
Adhesive manufacturing	$0.0	$0.0	$0.0	$65.5	$6.7	$72.3	$72.3
Metal window and door manufacturing	$0.1	$4.5	$4.6	$65.0	$1.5	$66.6	$71.2
Coal mining	$0.0	$0.0	$0.0	$68.3	$1.1	$69.3	$69.3
Sign manufacturing	$0.4	$33.6	$34.0	$10.6	$24.6	$35.1	$69.1
Surface active agent manufacturing	$0.0	$0.0	$0.0	$66.1	$2.6	$68.7	$68.7
Wiring device manufacturing	$3.5	$12.9	$16.5	$48.6	$3.2	$51.9	$68.4
Surgical and medical instrument manufacturin	$1.4	$0.0	$1.4	$46.8	$19.3	$66.1	$67.5
Pipeline transportation	$0.2	$0.0	$0.2	$60.9	$5.8	$66.7	$66.9
Specialized design services	$0.0	$0.0	$0.0	$53.0	$13.2	$66.3	$66.3

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	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Computer storage device manufacturing	$0.1	$0.0	$0.1	$41.5	$23.7	$65.2	$65.3
Glass and glass products- except glass contai	$6.4	$0.0	$6.4	$46.7	$11.9	$58.7	$65.1
Wineries	$0.2	$2.0	$2.1	$9.0	$53.5	$62.5	$64.6
Aluminum sheet- plate- and foil manufacturing	$0.0	$0.0	$0.0	$64.1	$0.0	$64.1	$64.1
Sawmills	$6.3	$0.0	$6.3	$56.1	$1.6	$57.7	$64.0
Other aircraft parts and equipment	$0.7	$1.8	$2.5	$13.3	$48.1	$61.4	$63.9
Other snack food manufacturing	$0.0	$0.0	$0.0	$7.2	$56.7	$63.9	$63.9
Gasoline stations	$0.0	$49.6	$49.6	$2.1	$11.9	$13.9	$63.5
Clothing and clothing accessories stores	$0.0	$0.0	$0.0	$9.2	$53.8	$63.1	$63.1
Motor and generator manufacturing	$5.0	$1.9	$7.0	$40.4	$15.7	$56.0	$63.0
Gasket- packing- and sealing device manufac	$11.7	$32.1	$43.8	$16.4	$2.5	$18.9	$62.7
All other food manufacturing	$3.0	$0.0	$3.0	$6.8	$52.4	$59.1	$62.1
Independent artists- writers- and performers	$0.0	$0.0	$0.0	$60.0	$1.7	$61.7	$61.7
Boat building	$0.3	$8.8	$9.1	$4.4	$48.1	$52.4	$61.6
Coated and laminated paper and packaging r	$0.2	$6.6	$6.8	$37.3	$17.5	$54.8	$61.6
Miscellaneous fabricated metal product manuf	$1.5	$6.0	$7.4	$31.0	$22.9	$54.0	$61.4
Other accommodations	$0.0	$43.0	$43.0	$0.2	$17.0	$17.1	$60.1
Upholstered household furniture manufacturing	$0.0	$0.0	$0.0	$0.0	$59.7	$59.7	$59.7
Industrial and commercial fan and blower man	$4.6	$19.7	$24.2	$25.8	$8.5	$34.3	$58.6
Wood windows and door manufacturing	$0.1	$0.0	$0.1	$56.2	$2.1	$58.3	$58.4
Carpet and rug mills	$0.0	$0.1	$0.1	$14.1	$44.1	$58.1	$58.3
Confectionery manufacturing from purchased	$0.0	$2.9	$2.9	$1.4	$52.8	$54.2	$57.1
Gypsum product manufacturing	$0.8	$33.1	$33.9	$21.5	$0.6	$22.1	$56.0
All other crop farming	$0.9	$13.7	$14.7	$39.2	$1.8	$41.0	$55.7
Photographic film and chemical manufacturing	$1.1	$0.0	$1.1	$9.7	$44.3	$54.0	$55.0
Fluid milk manufacturing	$0.2	$0.0	$0.2	$6.6	$47.2	$53.9	$54.1
All other converted paper product manufacturi	$3.9	$28.7	$32.6	$8.2	$12.5	$20.7	$53.3
Sporting goods- hobby- book and music store	$0.0	$0.0	$0.0	$6.0	$47.0	$53.0	$53.0
Other miscellaneous textile product mills	$3.0	$22.1	$25.1	$11.3	$16.1	$27.5	$52.5
Agriculture and forestry support activities	$0.0	$31.8	$31.9	$17.9	$2.5	$20.3	$52.2
Electronic equipment repair and maintenance	$0.0	$0.0	$0.0	$21.7	$29.7	$51.4	$51.4
Sound recording industries	$0.1	$0.0	$0.1	$11.6	$39.1	$50.7	$50.8
Dog and cat food manufacturing	$0.0	$0.0	$0.0	$1.4	$49.4	$50.8	$50.8
All other transportation equipment manufacturi	$0.5	$12.7	$13.2	$9.9	$26.7	$36.6	$49.9
Stone mining and quarrying	$0.0	$1.1	$1.1	$46.7	$1.9	$48.6	$49.7
Investigation and security services	$1.0	$0.0	$1.0	$24.1	$24.1	$48.2	$49.2
Steel wire drawing	$0.0	$12.7	$12.7	$30.0	$5.6	$35.5	$48.2
Switchgear and switchboard apparatus manuf	$6.0	$8.5	$14.5	$23.5	$10.1	$33.6	$48.1
Hardware manufacturing	$0.0	$0.0	$0.0	$43.3	$4.7	$48.0	$48.0
Foam product manufacturing	$0.0	$0.0	$0.0	$43.1	$4.1	$47.2	$47.2
Relay and industrial control manufacturing	$5.0	$3.9	$8.9	$31.9	$5.6	$37.6	$46.5
Sanitary paper product manufacturing	$0.0	$1.0	$1.0	$5.5	$39.7	$45.3	$46.2
Ice cream and frozen dessert manufacturing	$0.0	$0.0	$0.0	$22.0	$24.2	$46.1	$46.1
Breakfast cereal manufacturing	$0.0	$0.5	$0.5	$1.6	$43.8	$45.4	$45.9
Speed changers and mechanical power transi	$12.0	$0.0	$12.0	$33.2	$0.6	$33.8	$45.8
Sand- gravel- clay- and refractory mining	$2.3	$16.2	$18.5	$27.0	$0.2	$27.2	$45.7
Electromedical apparatus manufacturing	$6.9	$0.0	$6.9	$8.9	$28.7	$37.6	$44.5
Industrial mold manufacturing	$2.5	$17.5	$20.0	$8.4	$15.7	$24.1	$44.1
Other leather product manufacturing	$0.0	$0.0	$0.0	$6.7	$37.2	$43.8	$43.8
Other communications equipment manufacturi	$0.1	$0.0	$0.1	$21.8	$21.7	$43.5	$43.6
General and consumer goods rental except vi	$0.1	$15.9	$16.0	$10.4	$17.1	$27.5	$43.5
Broadwoven fabric mills	$0.5	$2.6	$3.1	$20.1	$19.6	$39.6	$42.8
Prefabricated wood building manufacturing	$0.2	$19.1	$19.3	$23.0	$0.2	$23.2	$42.5
Polish and other sanitation good manufacturin	$0.2	$0.0	$0.2	$6.3	$35.6	$41.9	$42.2
Health and personal care stores	$0.0	$0.0	$0.0	$8.8	$33.1	$41.9	$41.9
Plastics pipe- fittings- and profile shapes	$0.0	$0.0	$0.0	$41.4	$0.5	$41.9	$41.9

Appendix C - Table 2: Hampton Roads Import and Export Markets Con't

2002

Millions of 2005 Dollars

	Export Markets			Import Markets			Total Marke
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Laboratory apparatus and furniture manufactu	$0.0	$0.0	$0.0	$39.0	$2.8	$41.8	$41.8
Cement manufacturing	$0.0	$4.1	$4.1	$36.9	$0.4	$37.3	$41.4
Telephone apparatus manufacturing	$0.0	$0.0	$0.0	$7.2	$33.9	$41.1	$41.1
Child day care services	$0.0	$0.0	$0.0	$0.0	$40.5	$40.5	$40.5
Ornamental and architectural metal work manu	$0.0	$7.6	$7.7	$31.2	$1.7	$32.8	$40.5
Cookie and cracker manufacturing	$0.0	$0.0	$0.0	$6.0	$34.3	$40.3	$40.3
Miscellaneous electrical equipment manufactu	$5.8	$0.0	$5.8	$5.5	$28.8	$34.3	$40.2
Reconstituted wood product manufacturing	$3.7	$28.0	$31.7	$7.7	$0.2	$7.9	$39.6
Spring and wire product manufacturing	$2.7	$8.9	$11.7	$24.3	$3.0	$27.2	$38.9
Electric housewares and household fan manuf	$0.0	$0.0	$0.0	$9.6	$29.2	$38.8	$38.8
Concrete pipe manufacturing	$0.0	$21.5	$21.5	$16.6	$0.1	$16.7	$38.2
Textile bag and canvas mills	$0.9	$20.0	$20.9	$10.4	$6.7	$17.1	$38.1
Grain farming	$6.8	$11.3	$18.1	$13.2	$6.7	$19.9	$38.1
Hand and edge tool manufacturing	$0.0	$0.1	$0.1	$16.9	$21.1	$38.0	$38.0
Aircraft engine and engine parts manufacturin	$0.5	$1.3	$1.8	$11.6	$24.4	$36.0	$37.9
All other forging and stamping	$0.0	$5.9	$6.0	$28.6	$2.9	$31.5	$37.5
Glass container manufacturing	$1.8	$35.0	$36.8	$0.0	$0.0	$0.0	$36.8
Dry- condensed- and evaporated dairy produc	$0.0	$0.0	$0.0	$9.4	$27.1	$36.5	$36.5
Other miscellaneous chemical product manufa	$0.0	$0.0	$0.0	$26.6	$9.8	$36.4	$36.4
Other millwork- including flooring	$0.2	$0.0	$0.2	$35.0	$1.1	$36.1	$36.3
Metal tank- heavy gauge- manufacturing	$1.0	$10.4	$11.4	$14.1	$10.8	$24.9	$36.3
Printing machinery and equipment manufactur	$19.9	$2.9	$22.9	$1.2	$12.2	$13.4	$36.2
Narrow fabric mills and schiffli embroidery	$18.8	$13.6	$32.4	$2.4	$1.3	$3.7	$36.0
Manifold business forms printing	$0.0	$0.0	$0.0	$13.5	$22.4	$35.9	$35.9
Office supplies- except paper- manufacturing	$1.7	$6.7	$8.3	$6.4	$20.5	$26.9	$35.2
Tree nut farming	$0.0	$0.0	$0.0	$29.7	$5.4	$35.2	$35.2
Concrete block and brick manufacturing	$0.1	$9.8	$9.9	$24.9	$0.3	$25.2	$35.1
Propulsion units and parts for space vehicles a	$0.0	$0.0	$0.0	$0.0	$35.1	$35.1	$35.1
Distilleries	$0.0	$0.1	$0.1	$8.8	$25.3	$34.2	$34.3
Plastics packaging materials- film and sheet	$8.4	$0.0	$8.4	$19.8	$4.9	$24.7	$33.2
Water- sewer- and pipeline construction	$0.0	$33.1	$33.1	$0.0	$0.0	$0.0	$33.1
Asphalt shingle and coating materials manufa	$0.0	$0.0	$0.0	$30.7	$2.1	$32.8	$32.8
Oilseed farming	$8.9	$20.2	$29.1	$2.3	$1.2	$3.5	$32.6
Warehousing and storage	$3.6	$29.0	$32.6	$0.0	$0.0	$0.0	$32.6
Office furniture- except wood- manufacturing	$0.0	$0.0	$0.0	$4.3	$28.1	$32.4	$32.4
Watch- clock- and other measuring and contrc	$4.3	$0.0	$4.3	$3.4	$24.6	$27.9	$32.2
Logging	$1.0	$0.0	$1.0	$30.8	$0.0	$30.8	$31.8
Asphalt paving mixture and block manufacturir	$0.1	$0.0	$0.1	$30.7	$1.0	$31.7	$31.7
Mineral wool manufacturing	$0.0	$0.1	$0.1	$31.5	$0.0	$31.5	$31.6
Accessories and other apparel manufacturing	$5.8	$0.7	$6.5	$1.2	$23.8	$25.0	$31.6
Drycleaning and laundry services	$0.0	$16.5	$16.5	$3.8	$10.8	$14.6	$31.1
Fats and oils refining and blending	$0.2	$3.7	$3.9	$9.1	$17.9	$27.0	$30.9
Metal cutting machine tool manufacturing	$11.9	$0.0	$11.9	$0.7	$17.8	$18.6	$30.5
Motor vehicle body manufacturing	$0.1	$0.0	$0.1	$28.2	$1.7	$29.9	$30.0
Ammunition manufacturing	$5.0	$13.8	$18.8	$0.8	$10.4	$11.2	$30.0
Forest nurseries- forest products- and timber t	$0.4	$14.0	$14.4	$15.3	$0.1	$15.4	$29.8
Cut stone and stone product manufacturing	$0.1	$4.5	$4.6	$19.4	$5.5	$24.9	$29.5
Household cooking appliance manufacturing	$0.0	$0.0	$0.0	$4.5	$24.9	$29.5	$29.5
Rendering and meat byproduct processing	$1.7	$27.3	$29.0	$0.3	$0.0	$0.3	$29.4
Totalizing fluid meters and counting devices	$0.0	$0.7	$0.7	$25.7	$2.5	$28.2	$28.9
Furniture and home furnishings stores	$0.0	$0.0	$0.0	$4.9	$23.9	$28.8	$28.8
Vitreous china and earthenware articles manu	$3.0	$2.9	$5.9	$1.8	$21.0	$22.8	$28.7
Prefabricated metal buildings and component	$0.0	$0.4	$0.4	$24.9	$2.9	$27.8	$28.2
Ball and roller bearing manufacturing	$0.0	$0.0	$0.0	$21.6	$5.0	$26.6	$26.6
Travel trailer and camper manufacturing	$0.6	$0.0	$0.6	$0.4	$25.5	$25.9	$26.5
Books printing	$0.7	$0.8	$1.5	$22.8	$2.0	$24.9	$26.3

Appendix C - Table 2: Hampton Roads Import and Export Markets Con't

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Millions of 2005 Dollars

	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Primary aluminum production	$0.0	$0.7	$0.7	$25.5	$0.0	$25.5	$26.2
Mayonnaise- dressing- and sauce manufactur	$0.3	$0.0	$0.3	$10.0	$15.9	$25.9	$26.1
Photographic and photocopying equipment m	$1.1	$0.0	$1.1	$3.2	$21.8	$25.0	$26.1
Electroplating- anodizing- and coloring metal	$0.0	$1.4	$1.4	$24.4	$0.0	$24.4	$25.8
Poultry and egg production	$0.2	$9.2	$9.3	$5.0	$11.1	$16.1	$25.4
Motor home manufacturing	$0.0	$0.0	$0.0	$0.0	$25.2	$25.2	$25.2
Promoters of performing arts and sports and a	$0.2	$0.0	$0.2	$9.7	$15.2	$24.9	$25.1
Institutional furniture manufacturing	$3.5	$0.0	$3.5	$5.5	$16.1	$21.6	$25.1
Pesticide and other agricultural chemical man	$1.2	$4.4	$5.7	$7.4	$12.0	$19.4	$25.0
Petroleum lubricating oil and grease manufact	$0.6	$24.4	$24.9	$0.0	$0.0	$0.1	$25.0
Industrial truck- trailer- and stacker manufactur	$3.3	$4.3	$7.6	$3.1	$13.8	$16.9	$24.6
Military armored vehicles and tank parts manu	$0.0	$0.2	$0.2	$0.0	$24.1	$24.1	$24.4
Wood kitchen cabinet and countertop manufac	$0.2	$0.0	$0.2	$23.2	$0.8	$24.0	$24.2
Heating equipment- except warm air furnaces	$0.0	$0.1	$0.1	$17.3	$6.1	$23.4	$23.6
Maintenance and repair of nonresidential build	$0.5	$22.9	$23.3	$0.0	$0.0	$0.0	$23.3
Engineered wood member and truss manufac	$0.4	$0.0	$0.4	$22.5	$0.4	$22.9	$23.2
Sugar manufacturing	$0.0	$0.0	$0.0	$8.1	$14.9	$23.0	$23.0
Flavoring syrup and concentrate manufacturing	$0.0	$0.0	$0.0	$21.9	$0.9	$22.8	$22.8
Electric lamp bulb and part manufacturing	$0.0	$0.0	$0.0	$6.7	$16.0	$22.7	$22.7
Flour milling	$0.2	$3.3	$3.5	$12.0	$7.2	$19.2	$22.7
Veterinary services	$0.0	$17.4	$17.4	$0.4	$4.9	$5.3	$22.6
Manufacturing and industrial buildings	$0.0	$0.0	$0.0	$0.0	$22.6	$22.6	$22.6
Other animal food manufacturing	$0.2	$6.1	$6.4	$11.1	$4.9	$16.0	$22.4
Fluid power cylinder and actuator manufacturi	$0.2	$2.1	$2.3	$17.3	$2.8	$20.1	$22.3
Spice and extract manufacturing	$0.3	$0.0	$0.3	$7.1	$14.8	$22.0	$22.2
Primary nonferrous metal- except copper and	$0.0	$0.0	$0.0	$21.9	$0.2	$22.1	$22.1
Nonferrous metal- except copper and aluminu	$0.0	$3.9	$3.9	$16.5	$1.7	$18.2	$22.1
Maintenance and repair of highways- streets-	$0.0	$22.0	$22.0	$0.0	$0.0	$0.0	$22.0
Fluid power pump and motor manufacturing	$0.0	$1.0	$1.0	$20.0	$0.9	$20.8	$21.8
Ophthalmic goods manufacturing	$8.4	$2.5	$10.9	$0.4	$10.3	$10.7	$21.6
Industrial gas manufacturing	$0.1	$0.0	$0.1	$14.3	$6.9	$21.2	$21.2
Maintenance and repair of farm and nonfarm r	$0.0	$21.1	$21.1	$0.0	$0.0	$0.0	$21.1
Frozen cakes and other pastries manufacturin	$0.0	$0.0	$0.0	$0.5	$20.3	$20.8	$20.8
Bowling centers	$0.0	$18.5	$18.5	$0.1	$2.1	$2.2	$20.7
Magnetic and optical recording media manufa	$1.3	$0.0	$1.3	$15.1	$3.9	$19.0	$20.3
Nonwoven fabric mills	$0.0	$1.4	$1.4	$16.3	$2.4	$18.7	$20.1
New multifamily housing structures- nonfarm	$0.0	$0.0	$0.0	$0.0	$20.0	$20.0	$20.0
Home health care services	$0.0	$20.0	$20.0	$0.0	$0.0	$0.0	$20.0
Cotton farming	$11.0	$6.9	$18.0	$0.2	$1.7	$1.8	$19.8
Household refrigerator and home freezer man	$0.0	$0.0	$0.0	$0.6	$18.9	$19.6	$19.6
Electricity and signal testing instruments	$3.2	$3.0	$6.1	$1.5	$11.9	$13.4	$19.5
Miscellaneous wood product manufacturing	$0.5	$0.0	$0.5	$12.2	$6.5	$18.7	$19.2
Household goods repair and maintenance	$0.1	$4.8	$4.9	$6.7	$7.5	$14.2	$19.1
Software reproducing	$0.0	$0.0	$0.0	$18.9	$0.1	$19.0	$19.0
Photographic services	$0.0	$8.6	$8.6	$2.7	$7.7	$10.4	$19.0
Fabricated pipe and pipe fitting manufacturing	$0.0	$0.0	$0.0	$17.7	$0.9	$18.6	$18.6
Envelope manufacturing	$0.0	$0.0	$0.0	$7.4	$11.2	$18.6	$18.6
New residential additions and alterations- non	$0.0	$0.0	$0.0	$0.0	$18.3	$18.3	$18.3
Computer terminal manufacturing	$0.0	$0.0	$0.0	$13.5	$4.4	$17.9	$17.9
Performing arts companies	$0.2	$0.0	$0.2	$6.0	$11.6	$17.6	$17.8
Nitrogenous fertilizer manufacturing	$0.0	$0.9	$0.9	$14.5	$2.4	$16.9	$17.8
Other tobacco product manufacturing	$0.0	$0.0	$0.0	$0.0	$17.6	$17.7	$17.7
Other nonmetallic mineral mining	$0.0	$0.4	$0.4	$12.0	$5.1	$17.2	$17.6
Cutlery and flatware- except precious- manufa	$0.0	$0.0	$0.0	$3.1	$14.5	$17.6	$17.6
Primary smelting and refining of copper	$0.0	$0.2	$0.2	$17.3	$0.0	$17.3	$17.5
Coated and uncoated paper bag manufacturir	$0.2	$0.9	$1.0	$8.5	$7.9	$16.4	$17.4

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	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Rubber and plastics hose and belting manufac	$0.9	$2.2	$3.2	$9.9	$4.3	$14.3	$17.4
Cutting tool and machine tool accessory manu	$0.0	$0.0	$0.0	$16.4	$1.0	$17.4	$17.4
Broom- brush- and mop manufacturing	$0.0	$0.1	$0.1	$8.3	$8.6	$16.9	$17.1
Synthetic rubber manufacturing	$0.0	$3.6	$3.6	$13.4	$0.0	$13.4	$17.0
Other ordnance and accessories manufacturir	$0.0	$0.6	$0.6	$0.0	$16.4	$16.4	$16.9
Fitness and recreational sports centers	$0.0	$0.0	$0.0	$5.7	$11.1	$16.8	$16.8
Miscellaneous nonmetallic mineral products	$1.4	$6.4	$7.8	$9.0	$0.0	$9.1	$16.8
Household vacuum cleaner manufacturing	$0.0	$0.0	$0.0	$2.1	$14.7	$16.8	$16.8
Automatic environmental control manufacturing	$0.1	$1.5	$1.6	$14.8	$0.3	$15.2	$16.8
Veneer and plywood manufacturing	$2.9	$0.0	$2.9	$13.0	$0.5	$13.5	$16.4
Farm machinery and equipment manufacturing	$6.1	$0.0	$6.1	$0.8	$9.4	$10.2	$16.3
Hunting and trapping	$0.0	$2.7	$2.7	$0.0	$13.4	$13.4	$16.2
Household laundry equipment manufacturing	$0.0	$0.0	$0.0	$0.2	$15.8	$16.0	$16.0
Custom roll forming	$0.0	$0.6	$0.6	$15.1	$0.0	$15.2	$15.8
Other major household appliance manufacturir	$0.0	$0.0	$0.0	$11.8	$3.9	$15.7	$15.7
Industrial process variable instruments	$1.0	$1.2	$2.2	$6.1	$7.4	$13.6	$15.7
Custom architectural woodwork and millwork	$0.0	$12.3	$12.3	$3.0	$0.3	$3.3	$15.6
Prepress services	$0.0	$0.8	$0.9	$12.1	$2.7	$14.7	$15.6
Wood container and pallet manufacturing	$0.1	$0.0	$0.1	$13.0	$2.0	$14.9	$15.0
Fiber- yarn- and thread mills	$0.0	$0.3	$0.3	$13.1	$1.5	$14.6	$15.0
Audio and video media reproduction	$0.0	$0.0	$0.0	$14.0	$0.8	$14.7	$14.7
Custom compounding of purchased resins	$0.0	$0.0	$0.0	$14.5	$0.0	$14.5	$14.5
Metal household furniture manufacturing	$0.2	$0.0	$0.2	$1.4	$12.7	$14.1	$14.3
Highway- street- bridge- and tunnel constructic	$0.0	$14.0	$14.0	$0.0	$0.0	$0.0	$14.0
Printing ink manufacturing	$0.0	$0.0	$0.0	$13.5	$0.4	$13.9	$13.9
Storage battery manufacturing	$1.0	$0.0	$1.0	$4.9	$8.0	$12.9	$13.9
Optical instrument and lens manufacturing	$0.0	$0.0	$0.0	$1.2	$12.7	$13.9	$13.9
Lawn and garden equipment manufacturing	$4.0	$0.0	$4.0	$0.5	$9.3	$9.8	$13.8
Iron and steel forging	$0.0	$0.0	$0.0	$12.2	$1.5	$13.8	$13.8
Musical instrument manufacturing	$0.1	$0.2	$0.3	$2.5	$10.9	$13.4	$13.7
Sheer hosiery mills	$0.0	$0.0	$0.0	$0.0	$13.4	$13.4	$13.4
Death care services	$0.0	$5.6	$5.6	$0.0	$7.7	$7.7	$13.2
Video tape and disc rental	$0.0	$7.8	$7.8	$0.0	$5.2	$5.2	$13.0
Primary battery manufacturing	$0.0	$0.0	$0.0	$0.6	$12.3	$12.9	$12.9
Synthetic dye and pigment manufacturing	$0.0	$0.0	$0.0	$8.1	$4.7	$12.8	$12.8
Die-cut paper office supplies manufacturing	$0.0	$0.2	$0.2	$8.0	$4.3	$12.3	$12.5
Electric power and specialty transformer manu	$0.0	$0.1	$0.1	$6.8	$5.6	$12.4	$12.5
Elevator and moving stairway manufacturing	$0.0	$0.0	$0.0	$11.9	$0.5	$12.4	$12.4
Automatic vending- commercial laundry and d	$0.0	$0.0	$0.0	$1.4	$11.0	$12.4	$12.4
Textile and fabric finishing mills	$0.0	$2.0	$2.0	$7.8	$2.4	$10.2	$12.2
Analytical laboratory instrument manufacturing	$1.7	$1.8	$3.4	$4.1	$4.5	$8.6	$12.0
Dental equipment and supplies manufacturing	$0.0	$0.0	$0.0	$10.9	$1.1	$12.0	$12.0
Showcases- partitions- shelving- and lockers	$0.1	$0.0	$0.1	$6.3	$5.5	$11.8	$11.9
Other commercial and service industry machir	$2.5	$0.0	$2.5	$2.4	$7.0	$9.4	$11.9
Blind and shade manufacturing	$0.0	$0.0	$0.0	$0.0	$11.8	$11.8	$11.8
Metal heat treating	$0.0	$0.8	$0.8	$10.9	$0.0	$11.0	$11.8
Office machinery manufacturing	$0.0	$0.0	$0.0	$1.5	$10.1	$11.6	$11.6
Wet corn milling	$0.0	$0.1	$0.1	$8.0	$3.5	$11.5	$11.6
Overhead cranes- hoists- and monorail systen	$0.0	$3.6	$3.6	$3.7	$4.1	$7.8	$11.4
Plastics bottle manufacturing	$0.1	$0.0	$0.1	$11.2	$0.0	$11.2	$11.2
Brick and structural clay tile manufacturing	$0.0	$0.0	$0.0	$10.8	$0.3	$11.2	$11.2
Air purification equipment manufacturing	$0.3	$4.0	$4.3	$4.1	$2.7	$6.8	$11.1
Conveyor and conveying equipment manufacti	$0.5	$4.2	$4.7	$0.8	$5.2	$6.1	$10.8
Tradebinding and related work	$0.0	$0.0	$0.0	$5.0	$5.7	$10.7	$10.7
Power-driven handtool manufacturing	$0.5	$0.0	$0.5	$2.6	$7.4	$10.0	$10.5
Welding and soldering equipment manufacturi	$0.0	$0.0	$0.0	$7.9	$2.6	$10.4	$10.4

Appendix C - Table 2: Hampton Roads Import and Export Markets Con't

2002

Millions of 2005 Dollars

	Export Markets			Import Markets			Total Market
	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Car washes	$0.0	$0.0	$0.0	$1.9	$8.1	$10.0	$10.0
Ceramic wall and floor tile manufacturing	$0.0	$0.0	$0.0	$9.7	$0.3	$9.9	$10.0
Blankbook and looseleaf binder manufacturing	$0.0	$0.0	$0.0	$0.9	$8.5	$9.5	$9.5
Creamery butter manufacturing	$0.0	$0.0	$0.0	$3.0	$6.2	$9.2	$9.2
Rice milling	$0.0	$1.6	$1.6	$1.2	$6.4	$7.6	$9.1
Confectionery manufacturing from cacao bear	$0.0	$1.5	$1.5	$2.2	$5.1	$7.3	$8.9
Vitreous china plumbing fixture manufacturing	$0.0	$0.0	$0.0	$8.7	$0.1	$8.8	$8.8
Power boiler and heat exchanger manufacturi	$0.0	$0.6	$0.6	$7.7	$0.5	$8.2	$8.8
Kitchen utensil- pot- and pan manufacturing	$0.0	$0.0	$0.0	$2.2	$6.5	$8.7	$8.7
Wood office furniture manufacturing	$0.0	$0.0	$0.0	$0.0	$8.6	$8.6	$8.6
Fiber optic cable manufacturing	$0.0	$0.0	$0.0	$8.4	$0.1	$8.5	$8.5
Nonferrous forging	$0.0	$0.0	$0.0	$7.0	$1.4	$8.4	$8.4
Small arms manufacturing	$0.0	$0.3	$0.3	$0.9	$7.1	$8.0	$8.4
Enameled iron and metal sanitary ware manuf	$0.0	$0.0	$0.0	$8.0	$0.2	$8.3	$8.3
Dry pasta manufacturing	$0.0	$0.0	$0.0	$1.1	$7.2	$8.2	$8.2
Saw blade and handsaw manufacturing	$0.0	$0.0	$0.0	$5.0	$3.2	$8.2	$8.2
Electron tube manufacturing	$0.0	$5.3	$5.3	$2.3	$0.6	$2.9	$8.2
Cut stock- resawing lumber- and planing	$0.0	$0.0	$0.0	$7.4	$0.6	$8.1	$8.1
Resilient floor covering manufacturing	$0.3	$0.0	$0.3	$6.9	$0.9	$7.8	$8.1
Other hosiery and sock mills	$0.0	$0.0	$0.0	$0.0	$8.0	$8.0	$8.0
Mattress manufacturing	$0.4	$5.2	$5.6	$0.0	$1.9	$1.9	$7.6
Noncellulosic organic fiber manufacturing	$0.0	$0.4	$0.4	$7.0	$0.0	$7.0	$7.4
Mixes and dough made from purchased flour	$1.3	$4.4	$5.8	$0.2	$1.3	$1.4	$7.2
Tortilla manufacturing	$0.0	$0.0	$0.0	$1.1	$6.0	$7.1	$7.1
Ground or treated minerals and earths manufa	$0.0	$0.4	$0.4	$6.1	$0.6	$6.7	$7.1
Cellulosic organic fiber manufacturing	$0.0	$0.7	$0.7	$6.3	$0.0	$6.3	$7.0
Wood preservation	$0.4	$0.9	$1.3	$5.4	$0.0	$5.4	$6.8
Irradiation apparatus manufacturing	$0.0	$0.0	$0.0	$4.3	$1.7	$6.1	$6.1
Flexible packaging foil manufacturing	$0.0	$0.0	$0.0	$6.0	$0.0	$6.0	$6.0
Burial casket manufacturing	$0.0	$0.0	$0.0	$6.0	$0.0	$6.0	$6.0
Leather and hide tanning and finishing	$0.0	$0.0	$0.0	$6.0	$0.0	$6.0	$6.0
Special tool- die- jig- and fixture manufacturing	$0.7	$2.0	$2.6	$1.0	$2.3	$3.3	$5.9
Clay refractory and other structural clay produc	$0.1	$1.2	$1.3	$4.4	$0.1	$4.6	$5.9
Porcelain electrical supply manufacturing	$0.0	$0.3	$0.3	$5.3	$0.2	$5.4	$5.8
All other industrial machinery manufacturing	$0.2	$0.0	$0.2	$1.1	$4.1	$5.2	$5.4
Semiconductor machinery manufacturing	$0.1	$0.0	$0.1	$5.0	$0.1	$5.2	$5.2
Dental laboratories	$0.0	$4.9	$4.9	$0.2	$0.0	$0.2	$5.1
Paper industry machinery manufacturing	$2.0	$0.8	$2.8	$0.3	$1.9	$2.2	$5.0
Industrial pattern manufacturing	$0.0	$0.7	$0.7	$4.3	$0.0	$4.3	$5.0
Fabric coating mills	$0.0	$0.2	$0.2	$4.1	$0.4	$4.5	$4.7
Other maintenance and repair construction	$0.0	$4.6	$4.6	$0.0	$0.0	$0.0	$4.6
Sawmill and woodworking machinery	$0.2	$0.0	$0.2	$0.6	$3.4	$4.0	$4.2
Other household and institutional furniture	$0.0	$0.0	$0.0	$0.2	$3.8	$4.0	$4.0
Pulp mills	$0.0	$0.4	$0.4	$3.4	$0.0	$3.4	$3.9
Plastics and rubber industry machinery	$0.0	$0.0	$0.0	$2.8	$1.0	$3.8	$3.8
Mining machinery and equipment manufacturi	$0.0	$2.0	$2.0	$1.3	$0.4	$1.7	$3.7
Gold- silver- and other metal ore mining	$0.0	$0.0	$0.0	$3.7	$0.0	$3.7	$3.7
Stationery and related product manufacturing	$0.0	$0.3	$0.3	$2.1	$1.3	$3.4	$3.7
Other oilseed processing	$0.0	$0.1	$0.1	$0.8	$2.6	$3.4	$3.5
Soybean processing	$0.0	$0.2	$0.2	$2.9	$0.3	$3.3	$3.5
Truck trailer manufacturing	$0.0	$0.9	$0.9	$0.2	$2.0	$2.2	$3.1
Lime manufacturing	$0.0	$0.0	$0.0	$2.8	$0.0	$2.9	$2.9
Carbon and graphite product manufacturing	$0.0	$0.0	$0.0	$1.9	$0.7	$2.6	$2.6
Knit fabric mills	$0.0	$0.4	$0.4	$1.3	$0.8	$2.1	$2.6
Nonclay refractory manufacturing	$0.0	$0.0	$0.0	$2.4	$0.0	$2.4	$2.4
Surface-coated paperboard manufactuing	$0.0	$0.0	$0.0	$1.9	$0.5	$2.4	$2.4

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2002

Millions of 2005 Dollars

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	Foreign Exports	Domestic Exports	Total Exports	Imports for Production	Imports for Regional Final Use	Total Imports	Sum of Total Imports and Exports
Food product machinery manufacturing	$0.2	$0.0	$0.2	$1.4	$0.8	$2.2	$2.4
Laminated plastics plate- sheet- and shapes	$0.0	$0.0	$0.0	$2.4	$0.0	$2.4	$2.4
Ferroalloy and related product manufacturing	$0.1	$0.4	$0.5	$1.6	$0.0	$1.6	$2.1
Metal forming machine tool manufacturing	$0.0	$0.0	$0.0	$1.6	$0.2	$1.8	$1.8
Secondary processing of other nonferrous	$0.0	$0.0	$0.0	$1.7	$0.0	$1.7	$1.7
Explosives manufacturing	$0.0	$0.0	$0.0	$1.6	$0.0	$1.6	$1.6
Measuring and dispensing pump manufacturir	$0.2	$0.5	$0.6	$0.0	$0.7	$0.7	$1.3
Other aluminum rolling and drawing	$0.0	$0.0	$0.0	$1.2	$0.0	$1.2	$1.2
All other petroleum and coal products manufac	$0.0	$0.0	$0.0	$0.8	$0.4	$1.2	$1.2
Oil and gas field machinery and equipment	$0.0	$0.3	$0.3	$0.6	$0.1	$0.7	$1.0
Packaging machinery manufacturing	$0.0	$0.0	$0.0	$0.9	$0.0	$1.0	$1.0
Alumina refining	$0.0	$0.0	$0.0	$0.5	$0.2	$0.7	$0.7
Manufactured home- mobile home- manufactu	$0.0	$0.0	$0.0	$0.0	$0.7	$0.7	$0.7
Rolling mill and other metalworking machinery	$0.0	$0.2	$0.2	$0.3	$0.0	$0.3	$0.5
Tire cord and tire fabric mills	$0.0	$0.2	$0.2	$0.2	$0.0	$0.2	$0.5
Tobacco farming	$0.2	$0.1	$0.4	$0.1	$0.0	$0.1	$0.4
Malt manufacturing	$0.0	$0.0	$0.0	$0.4	$0.0	$0.4	$0.4
Textile machinery manufacturing	$0.0	$0.0	$0.0	$0.4	$0.0	$0.4	$0.4
Support activities for other mining	$0.0	$0.1	$0.1	$0.2	$0.0	$0.2	$0.3
New residential 1-unit structures- nonfarm	$0.0	$0.0	$0.0	$0.0	$0.3	$0.3	$0.3
Iron ore mining	$0.0	$0.0	$0.0	$0.3	$0.0	$0.3	$0.3
Tobacco stemming and redrying	$0.0	$0.0	$0.0	$0.1	$0.2	$0.2	$0.2
Sugarcane and sugar beet farming	$0.0	$0.0	$0.0	$0.2	$0.0	$0.2	$0.2
Industrial process furnace and oven manufactu	$0.0	$0.1	$0.1	$0.0	$0.0	$0.0	$0.2
Copper- nickel- lead- and zinc mining	$0.0	$0.1	$0.1	$0.0	$0.0	$0.0	$0.1

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