

How the Vermont Economy Works: A Primer on Growth, Spending, and Income

Prepared for GBIC

Arthur Woolf, Ph.D.
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One major goal of public policy should be the same as one major goal and aspiration that most Vermonters have: We would like standard of living to rise over time. From an individual's standpoint, that means an increase in his or her wage or salary each year; more specifically an increase that is greater than the cost of living, that is, a real, inflation-adjusted increase in salary.

No individual person is self-sufficient nor is any economy, which is no more than a group of people. We rely on trade with other people to provide us with goods and services that we cannot, or do not, produce ourselves. As Adam Smith pointed out more than two centuries ago, we all specialize and produce something that we trade to others. Whether it is a factory worker, an attorney, a teacher, or anyone else, we produce more of something than we can consume ourselves and we trade that excess to others in exchange for something that they produce that we want.

That trade can occur directly, as when a farmer produces vegetables and sells them to a teacher at a farmers' market. The farmer produces more than she and her family can eat and she willingly sells excess vegetables to someone who values those vegetables and is willing to pay for them. The farmer's standard of living is higher as a result of her production and trade, as is the teacher's. The farmer produces more vegetables than she can use and the teacher produces more educational services than he can use. Both trade with each other and are both better off. Each has a higher standard of as a result of the purchase.

I. A Simple Model of the Vermont Economy

This simple example is shown, in the general case, in figure 1. The green lines represent the flows of money in the economy. Vermont households buy goods (such as vegetables) from Vermont businesses. Vermont households earn incomes by working for Vermont businesses. Thus the two green lines are flows of money in the economy.

A Simple Model of the Vermont Economy

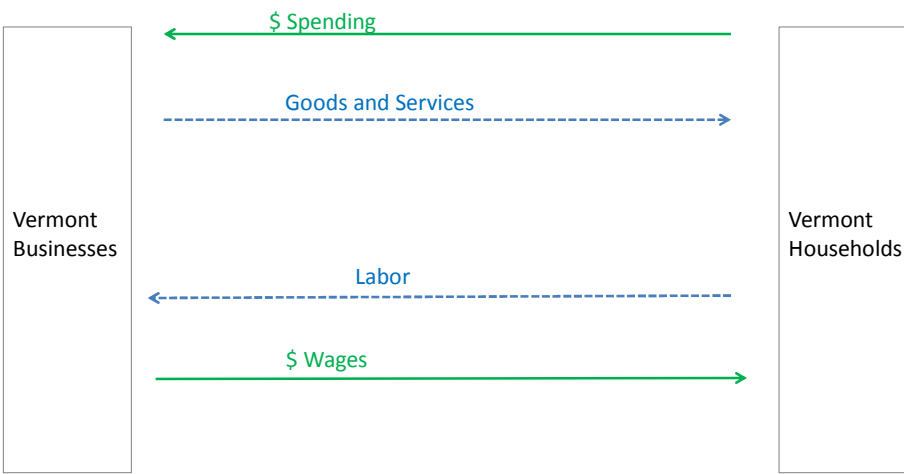


Figure 1

The blue dotted line at the top represents goods and services that are produced by Vermont firms and sold to Vermonters. Vermonters provide a valuable service to Vermont businesses—their labor—and are compensated for it through the wages that businesses pay to their workers. Thus money flows in the economy between businesses and households (green lines) in direct relationship to the corresponding value of the flow of goods and services (blue lines) produced by Vermont businesses and labor services provided by Vermont households in the form of work. In a simple economy \$100 of spending generates \$100 of income.¹

In this oversimplified model, if there is only a fixed amount of goods and services and therefore a fixed amount of income to be earned. If one household gets more income, it can only happen at the expense of some other household. The economy is a zero sum economy and an increase in the standard of living of one means a reduction in the standard of living of someone else, or of many people.

But there is a way for one household, or two, or all households to experience an increase in their standard of living—that is an increase in their incomes and an increase in their ability to consume more goods and services—without a corresponding reduction in others' standard of living. That will happen if businesses can figure out ways to produce their output using fewer resources. Another word for this is productivity. If productivity increases, costs and prices fall

¹ I ignore profits, rents, dividends, and other non-wage income. They complicate the model, but do not detract from the basic idea of what occurs.

and consumers have more money available to buy more of this or other goods and services. Economic growth has occurred and the standard of living of the average person, or of one person, can rise without a corresponding decline in anyone else's living level.

II. A more complicated, and realistic, model of the Vermont economy

Vermonters, of course, interact with people living outside of the state. They buy goods and services produced outside of Vermont, and people living outside of Vermont buy goods and services produced within Vermont. We buy cars, electronics, clothing, and food produced elsewhere in the U.S. and the world, and people in the U.S. and throughout the world buy computer chips, coffee, ice cream, jet engine parts, and computer software produced in Vermont. Others come to Vermont to ski, hike, get married, and recreate. And they spend money in Vermont. These are shown in Figure 2 below.

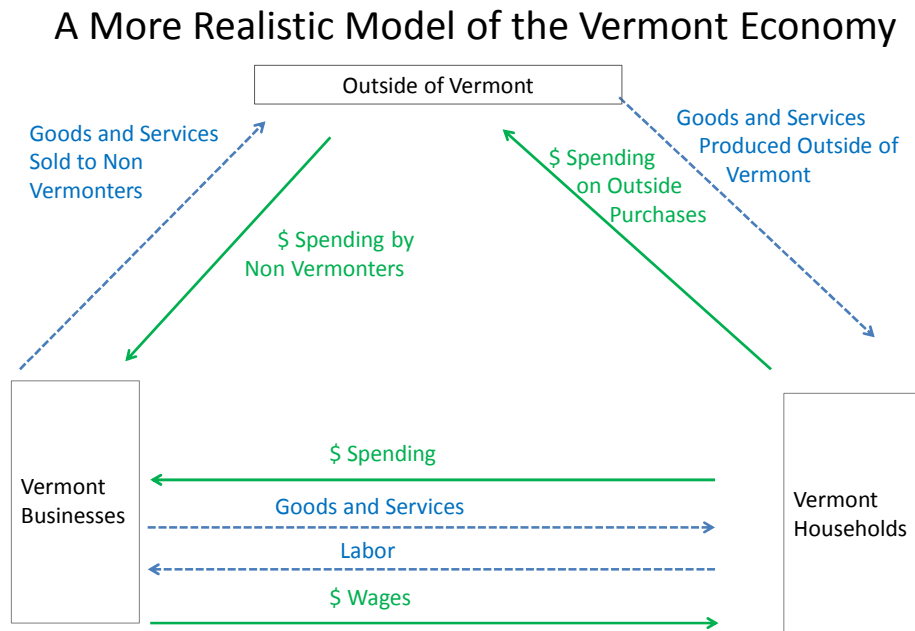


Figure 2

At the bottom, the graphic is the same as in figure 1. But the diagonal lines at the top show the interactions between Vermont and the rest of the world. The blue dotted line at the top left shows that Vermont businesses sell some (or all) of their output to customers in other states and nations.² They are paid for those goods and services (the green dotted line at top left),

² They also buy goods and services from suppliers outside of Vermont, but that makes the picture more complicated without changing the basics of what the model shows.

and they use some of that money to pay the wages Vermonters earn by working at those businesses.

Vermont households buy goods and services produced by businesses located outside of Vermont (the blue dotted line at top right) and pay for them (the green line at top right) with the incomes they earn by working in Vermont

Vermonters benefit from buying goods and services produced outside of the state's borders. Some of these are not able to be produced in Vermont. Others may be able to be produced in Vermont, but are much less expensive if produced elsewhere. Other products provide Vermonters with more variety than would be available if Vermonters could only buy them if they were produced locally.

The ability to trade with people and businesses located outside of Vermont increases Vermonters' standard of living. But in order to purchase these goods and services, Vermonters have to produce things that people outside of Vermont want to buy. The more we can do that, the higher will be our standard of living and the more goods and services we can purchase—both those produced within Vermont and outside of Vermont. And the higher our standard of living, the more incomes we earn and the more tax revenues state and local governments collect. So a rising standard of living benefits not only people in Vermont, but government as well.

III. What kinds of businesses bring in dollars from outside the state?

Any business that sells goods to out-of-state customers or imports those customers into the state brings in out-of-state dollars. We call these businesses, and the economic activity they generate, export activities.³ When tourists come to Vermont, tourism can be seen as an export business. When a Vermont manufacturer sells its output to a customer somewhere in the U.S. or in Europe or Asia, that, too, is an export. When a Vermont farmer sells milk to a creamery in Massachusetts, that is an export. We can use the U.S. Commerce Department's classification system and data from the Vermont Department of Labor to examine the size of each industry in Vermont and then to see how each industry contributes to Vermont's export economy.

³ Exports in this case means selling to non-Vermonters, not just people in other nations.

V. How Each Sector of the Vermont Economy Fits into the Model

Government: Government is the largest part of the state’s economy, accounting for 17.4% of all the payroll jobs in the state and nearly one-fifth of all the wages earned. Although government does provide important services that help an economy perform better, nearly all government services are closer to the first simple model developed earlier than to the more complicated model. That is, governments do not export their services outside of the state. Most of the inputs are paid for locally. That is, on net, government does not bring in revenues from outside of the state.

Vermont Payroll Employment and Wages in 2013				
Sector	Employment	Employment Share of Total	Wages in \$ million	Wage Share of Total
Government	52,603	17.4%	\$2,414.5	19.0%
Health Care & Social Assistance	48,778	16.2%	\$2,019.5	15.9%
Retail Trade	37,700	12.5%	\$1,034.4	8.2%
Manufacturing	31,715	10.5%	\$1,733.9	13.7%
Accommodation and Food Services	30,332	10.1%	\$583.6	4.6%
Professional and Business Services	26,420	8.8%	\$1,488.1	11.7%
Construction	14,091	4.7%	\$639.7	5.0%
Private Education	9,638	3.2%	\$398.0	3.1%
Wholesale Trade	9,210	3.1%	\$521.4	4.1%
Finance and Insurance	8,709	2.9%	\$588.7	4.6%
Transportation and Warehousing	6,651	2.2%	\$248.0	2.0%
Information	4,674	1.5%	\$240.6	1.9%
Arts, Entertainment, Recreation	4,029	1.3%	\$92.1	0.7%
Natural Resources	3,444	1.1%	\$118.0	0.9%
Real Estate	3,060	1.0%	\$115.0	0.9%
Utilities	1,789	0.6%	\$175.5	1.4%
Other	8,753	2.9%	\$268.7	2.1%
Total	301,596		\$12,679.7	
Source: Vermont Department of Labor, QCEW				

There are two exceptions to this. First, federal government workers do bring in dollars into the state since their salaries are paid for from the federal government. Second, some state and local employees are either paid in part or all by federal grants, and some are responsible for managing federal dollars coming into the state. But ultimately, federal funds coming into Vermont are largely, but not entirely, offset by the federal taxes Vermonters pay.

Health Care and Social Assistance: Health Care is the second largest industry in Vermont. It includes jobs in doctor's offices, hospitals, and nursing homes as well as people employed as social workers and caregivers for the elderly or infirm. Many of the jobs in this sector are high paying, but there is a wide distribution of pay here, especially in the social assistance part of this sector. Similar to the government sector, most of the economic activity generated within this sector is provided to Vermonters, although some income does come into the state through federal programs such as Medicare and Medicaid (the latter requires local tax sources as well as federal to support it). Health care also provides some export earnings when people from other states come into the Vermont to use health care facilities here, although the opposite also occurs when Vermonters, especially those living along the Connecticut River, travel to New Hampshire for medical services.

Retail: Retail trade is the third largest sector as measured by employment, although only fifth when measured by total wages paid. Most retail activity in Vermont is provided to Vermonters, so it does not generate a large amount of export earnings. The only exception is that tourists coming to Vermont who shop at the state's retail establishments do bring dollars into the state.

Manufacturing: Manufacturing is the fourth largest sector of the economy, accounting for more than one in ten jobs, and the third largest when measured as share of total wages. That means, of course, that this sector also pays higher than average wages to its employees. This is because of the high levels of productivity in this sector. Firms can only pay high wages if their employees are highly productive.

Of all the sectors of the state economy, manufacturing is the most important in terms of its ability to export goods outside of the state. Nearly all of Vermont's manufacturers produce their goods for national or international markets. They therefore play a crucial role in the ability of Vermont businesses to bring dollars into the state. This is, perhaps, even a more important role in the state economy than the high wages that they pay.

Accommodations and Food Services: The types of businesses in this sector include restaurants, bars, hotels, inns, and B&B's. Some of the economic activity generated in this sector is exported to people in other states, especially in the accommodations portion of this economic sector. When tourists come to Vermont, they spend money at lodging establishments and at local restaurants. This makes those businesses part of the state's export economy. Most of the revenues generated in lodging establishments comes from out of state guests, but that is not the case for restaurants, where some share of total spending is from tourists and out of town businesses but a significant amount comes from Vermonters dining out.

Professional and Business Services: This sector includes a wide variety of businesses—legal and accounting firms, architects and engineering firms, computer software companies, advertising firms, temporary help agencies, veterinarians, and other businesses. Because of the

wide variety of businesses in this sector, it is hard to generalize about their ability to export their services out of state. Some of them do export some services, but others exclusively or in large part provide their services to Vermont residents.

Firms in all of the sectors of the Vermont economy discussed above account for about three quarters of all payroll employment and roughly the same share of all wages paid and are therefore a dominant part of the state's economy. All remaining sectors are small and we provide a brief discussion of them.

Although several large **Construction** sector firms build projects out of state, the vast majority of economic activity in this sector occurs within Vermont, so there is little export activity here. The **Wholesale** trade sector provides goods to retailers and restaurants. Although some Vermont wholesalers do sell to out of state customers, most of this sector's sales are within Vermont. **Transportation and Warehousing** consists of trucking companies, courier services, taxis and similar businesses. Most of their activity is also within Vermont.

The **Information** sector includes television and radio stations, print shops, and data processing firms. Some, but probably not a great deal, of this sector's output is sold to non-Vermont customers.

Arts, Entertainment, and Recreation includes private museums, recording studios, and sporting venues, which in Vermont means most ski areas and many tourism oriented businesses (some ski areas may be categorized in the Accommodations sector of the economy). Although the sector is small, a large amount of its sales are to out of state customers.

The largest part of the **Natural Resources** sector is agriculture, and most of that consists of dairy farms. Most of this industry's output is sold out of state, although it is a small sector measured by both employment and wages. Because the underlying data is based on payroll employment, it may understate the size of this industry. Most farm owners earn incomes (or losses) as business owners rather than through wages, so the data may somewhat understate employment and income. The U.S. Commerce Department reports that total income accruing to farm proprietors is \$152 million, more than double the wage bill. Even including all of that income with wage income, the sector is still small.

Real Estate includes property management as well as real estate companies. Some of the economic activity in this small sector is export-based due to the large second home market in Vermont. **Utilities** are primarily gas, electric, and water systems. These are vitally important to Vermont's economy, but they have little direct role in the state's export economy.

The table below summarizes the role and importance of each of the sectors of the state economy to the export base of Vermont.

Comments on Sectoral Export Intensity	
Sector	How Much Economic Activity is Exported?
Government	Very little
Health Care & Social Assistance	Very little
Retail	Small amount
Manufacturing	Nearly all
Accommodation and Food Services	Large amount in accomodation, less in restaurants
Professional and Business Services	Unknown
Construction	Some from larger construction firms
Finance and Insurance	Some from large firms such as National Life
Education	Large amount from private post-secondary schools
Wholesale	Small amount
Transportation and Warehousing	Small amount
Information	Some, but probably a small amount
Arts, Entertainment, Recreation	Ski areas play a large role here
Natural Resources	Large amount due to dairying
Real Estate	Some due to second home market
Utilities	Very little

VI. A Closer Look at Manufacturing

The traditional way of looking at manufacturing was that it was an important part of Vermont's economy because it employed a lot of people, it paid high wages, and it provided good jobs and opportunities to Vermonters who did not have a lot of education or other skills and training. Many of those reasons are no longer as valid as they used to be. Manufacturing still employs a lot of people, but not nearly as many as in the past. In 1980 51,000 Vermonters worked in the manufacturing sector and one in four payroll jobs were in the sector. Today just under 32,000 people work in the sector and it accounts for about one in ten jobs. In the past, high school graduates and even high school dropouts could work in manufacturing, but that is no longer the case. Manufacturing employees work with sophisticated technology and firms often require either post-high school training or highly specific technical training in high school before they will hire someone.

What has not changed is that manufacturing wages tend to be higher than in many other sectors. Even more important is that manufacturing was, and is, a large and crucial part of Vermont's export-based economy. As explained in the model shown in figure 2, the sector provides a valuable conduit for dollars to flow into the state that support Vermonters' standard of living and, as productivity rises in manufacturing, it helps increase the standard of living of all residents of the state.

Within the manufacturing sector, the dominant subsector is computer and electronic products, and the dominant firm within that sector is IBM. One in five manufacturing workers work in that subsector and wages in that sector are one-half billion dollars per year, more than one-quarter of all the manufacturing wages in Vermont. Moreover, the average wage in that subsector is the highest by far within manufacturing and is more than 40% higher than the average manufacturing wage in Vermont.

Manufacturing Subsectors Employment and Wages in 2013					
Manufacturing Subsector	Employment	Employment Share	Total Wages in \$ million	Wage Share	Average Wage
Computer and electronic products	6,355	20.0%	\$500.2	28.8%	\$78,710
Food	5,163	16.3%	\$224.4	12.9%	\$43,463
Machinery	2,711	8.5%	\$151.7	8.7%	\$55,957
Fabricated metal products	2,348	7.4%	\$126.3	7.3%	\$53,790
Transportation equipment	1,990	6.3%	\$136.2	7.9%	\$68,442
Wood products	1,891	6.0%	\$73.8	4.3%	\$39,027
Nonmetallic mineral products	1,538	4.8%	\$71.3	4.1%	\$46,359
Furniture and related products	1,495	4.7%	\$55.3	3.2%	\$36,990
Electrical equipment	1,303	4.1%	\$71.7	4.1%	\$55,027
Chemicals	1,300	4.1%	\$73.8	4.3%	\$56,769
Plastics and rubber products	1,171	3.7%	\$55.3	3.2%	\$47,225
Printing and related support activities	1,040	3.3%	\$47.5	2.7%	\$45,673
Other	3,410	10.8%	\$146.4	8.4%	\$42,933
All Manufacturing	31,715		\$1,733.9		\$54,671
Source: Vermont Department of Labor, QCEW					

VIII. Conclusions

Vermont's economy is well integrated into the national and world economies. Vermonters buy goods and services produced outside of its borders, Vermont businesses sell goods and services to people located across the state's borders. Vermonters travel to other states and nations and visitors come to Vermont to recreate and do business. All of these activities are matched with a flow of dollars that come in and leave the state. The more integrated Vermont is with the nation and world, the more important these monetary flows become.

In order to take full advantage of this integration, which gives Vermonters a rising standard of living, Vermonters and Vermont policymakers need to be cognizant of the important role played by businesses that export goods and services. Exports allow us to buy more of what is produced outside of the state's borders, and that makes us better off. The state's

manufacturing sector is the most important component of the state's economy that accomplishes this goal. Within manufacturing, the computer sector, which includes IBM, is the dominant industry. The healthier that sector is, the healthier the overall economy is.