

**PELLISSIPPI STATE  
COMMUNITY COLLEGE**

*An Analysis  
Of the College's  
Economic and Social  
Impact*

*2012-2017*

*December 2017*

**PELLISSIPPI STATE COMMUNITY COLLEGE**

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*A Major Partner in the Economic Vitality of the Knoxville Metropolitan Area*

## Acknowledgments

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**Fred H. Martin, Educational Consultant**  
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**Richard Smelser, Director of Financial Aid**  
**Elisa Simmons, Financial Analyst**

**Note:** This report is also available on the College's web site at  
[http://www.pstcc.edu/ieap/files/pdf/FB\\_DR/Economic%20Social%20Impact%20Reports.php](http://www.pstcc.edu/ieap/files/pdf/FB_DR/Economic%20Social%20Impact%20Reports.php)

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PSCC is one of 40 institutions in the Tennessee Board of Regents (TBR) system, with a combined annual enrollment of nearly 120,000 students, ranking it the largest system of public higher education in Tennessee. TBR's 13 community colleges and 27 colleges of applied technology offer classes in almost all of Tennessee's 95 counties.

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## EXECUTIVE SUMMARY

Pellissippi State Community College has served the Knoxville metropolitan area since 1974, experiencing significant student enrollment growth as indicated in Figure 1. The enrollment for fall semester, 2017 for the College was a credit headcount of 11,168 students and a credit FTE of 7,090 students, making PSCC the largest community college in Tennessee.

This thirtieth annual analysis of the direct economic impact of Pellissippi State on Knox and Blount counties has recently been completed. It measures the College's five-year (2012-2017) economic impact on the community in terms of (1) business volume, (2) employment and (3) individual income. Not included in the study is the indirect economic impact that naturally results from having a trained and educated work force available to local business and industry.

The report is based on a standard model of economic impact modified for community colleges. The economic impact model is based on a circular cash flow model as illustrated in Figure 2. The model uses conservative income and employment multipliers, as illustrated in Figure 3, to determine economic impact.

The study reveals that more than \$318 million in "new", non-local, and state/federal revenues flowed into the area during 2012-2017 as a result of the College's presence. These external revenues represented 60.9 percent of the total College revenues for the period. The College also received more than \$204 million in local revenues during this period, for a grand total of more than \$523 million in revenues.

The following economic impact resulted from College expenditures of these revenues:

1. Local **business volume** generated by College expenditures during 2012-2017 was **\$617 million**, with \$481 million being due to non-local revenues, as shown in Figure 4. Annual business volume generated ranged from \$120.0 million to \$129.3 million.
2. Local **full-time-equivalent jobs** created and sustained during 2012-2017 as a result of the College's presence totaled **42,479 jobs**, including the College's own 2,801 jobs over that same period. Of this total, 32,599 jobs were the result of non-local revenues, as shown in Figure 5. Annual full-time jobs generated ranged from 8,284 to 8,848 jobs.
3. Local **individual income** generated by College expenditures during 2012-2017 totaled **\$649 million**, using the more conservative Type I multiplier, with \$518 million being due to non-local revenues, as shown in Figure 6. Annual Type I individual income generated ranged from \$124.5 million to \$137.9 million.

In summary, the combined five-year direct economic impact on the community represents **\$1.27 billion**, or an average of **\$253 million** per year. Of this amount, \$999 million, or more than \$199.8 million per year, is due to the infusion of "new" external/non-local revenues. This impact would likely not have occurred without the presence of Pellissippi State in the area.

**It is significant to note that for every \$1.00 of local revenues coming to Pellissippi State, there was \$3.02 of local business volume and from \$3.18 to \$3.42 of individual income generated, for a total return on investment (ROI) of \$6.20 to \$6.44 on the local dollar!**

In addition to the above local economic impacts, there are significant individual economic benefits that accrue to students earning two-year associate's degrees. National research has estimated a differential of about \$10,700 per year or **\$470,800** in lifetime earnings for associate's degree graduates compared with high school diploma holders. Applying that figure to the 2016-17 class of

1,455 Pellissippi State associate's degree graduates results in an estimate of more than **\$685 million** that this class alone could potentially earn over their high school diploma counterparts over their work lifetime, plus an increase of about **\$2.76 million** in annual local, state and federal tax payments.

Research on unemployment rates also shows lower unemployment rates for people with college degrees than for those with high school degrees or less. Finally, there are many demonstrated social benefits to increased levels of education that accrue to the broader society, in addition to the more personal economic benefits.

This study continues to document the significant force Pellissippi State has become in the economic and social vitality of the Knoxville metropolitan area.

## INTRODUCTION

Pellissippi State Community College has served the Knoxville metropolitan area since 1974, experiencing significant enrollment growth as indicated in Figure 1. The enrollment for fall semester, 2017 for the College was a credit headcount of 11,168 students and a credit FTE of 7,090 students, making PSCC the state's largest community college.

This report is the thirtieth annual analysis of the rolling five-year economic impact of Pellissippi State on the Knoxville metropolitan area. The primary counties affected are Knox and Blount, with approximately 87 percent of the College's expenditures being made, on the average, in those two counties.

The analysis measures the direct, explicit economic impact of Pellissippi State on the community. It does not include the implicit, intangible economic impact that results from having a trained and educated work force available for local business/industry or from expansion and recruitment of business/industry as a result of the College's presence. The analysis is based on the Caffrey model of economic impact, originally developed in 1968 through the American Council of Education. The model has been adapted for application to community colleges.<sup>1</sup>

The model uses conservative income and employment multipliers to determine Pellissippi State's economic impact on the following:

1. Business volume--the total amount of local business volume generated as a result of the College's direct and indirect expenditures.
2. Employment--the total number of local full-time-equivalent jobs generated and sustained by the College's direct and indirect expenditures.

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<sup>1</sup>Norval L. Wellsfry, "The Los Rios Community College District: A Major Partner in the Sacramento Area's Economic Vitality," 1988 (unpublished paper).

3. Individual income--the total amount of personal income earned by local households as a result of the College's direct and indirect expenditures.

Two additional components of the College's impact on the community are included in this study: (1) an estimate of the projected increase in lifetime earning capacity of the most recent class of Pellissippi State graduates compared to high school graduates, and (2) a description of the broader societal benefits of increased levels of higher education.

## **METHODOLOGY**

The economic impact model is based on a circular cash flow model as illustrated in Figure 2. The community is treated as a semi-closed economic system, with money entering the system through Pellissippi State from both local and external or "new" sources.

The local sources of revenue include student tuition/fees, local grants/contracts, private scholarships, gifts, and other miscellaneous local revenue. External or "new" revenues include state appropriations for both operating and capital purposes, federal/state student financial aid revenues, as well as state/federal grants and contracts.

Pellissippi State circulates its revenues through the local economy via expenditures for employee salaries and benefits, construction and maintenance of facilities, and local purchases of equipment and supplies. These expenditures are then re-circulated through the local economy, increasing in value and having a multiplier or secondary impact as local businesses and households make expenditures and generate jobs. Figure 3 illustrates the multiplier principle.

Economic impact on the community is measured on two levels: (1) in relationship to total expenditures from all revenue sources and (2) in relationship to expenditures from only those external or "new" revenues that would likely not have occurred without Pellissippi State's presence in

the economy. The following College revenues and expenditures for the five-year period 2012-2017 were incorporated into a MS Excel spreadsheet template containing the model.

<b>REVENUES</b>						
<b>SOURCES</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>TOTAL</b>
GENERAL						
STATE APPROPRIATION	20,887,437	22,986,345	23,492,038	25,690,650	27,413,600	120,470,070
LOCAL PROPERTY TAX						
ENROLLMENT FEES	34,910,095	35,425,711	36,416,116	34,601,103	34,804,520	176,157,545
TOTAL	55,797,532	58,412,056	59,908,154	60,291,753	62,218,120	296,627,615
FEDERAL	69,297	113,056	264,504	271,899	302,364	1,021,120
OTHER STATE	11,248	5,225		4,500	5,016	25,989
COUNTY						
LOCAL	1,618,365	2,115,412	2,399,177	2,597,812	2,762,049	11,492,815
OTHER LOCAL						
SPECIAL REVENUE						
FEDERAL	875,524	1,390,516	2,956,521	3,176,124	3,219,526	11,618,211
STATE	1,078,770	1,412,343	1,982,697	3,273,959	1,367,428	9,115,197
LOCAL	332,456	168,647	244,485	224,161	504,555	1,474,304
OTHER						
STUDENT FINANCIAL AID						
FEDERAL	37,376,126	31,903,045	25,433,260	21,553,143	19,942,691	136,208,265
STATE	5,975,723	6,070,970	6,337,077	9,953,647	12,388,886	40,726,303
LOCAL	2,390,340	3,252,307	3,959,080	3,130,998	1,978,594	14,711,319
OTHER						
TOTAL REVENUE	105,525,381	104,843,577	103,484,955	104,477,996	104,689,229	523,021,138
LOCAL	39,251,256	40,962,077	43,018,858	40,554,074	40,554,074	204,340,339
NON-LOCAL	66,274,125	63,881,500	60,466,097	63,923,922	63,923,922	318,469,566
LOCAL %	37.2%	39.1%	41.6%	38.8%	38.7%	39.1%
NON-LOCAL %	62.8%	60.9%	58.4%	61.2%	61.1%	60.9%

<b>EXPENDITURES</b>						
<b>DATA</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>TOTAL</b>
WAGES	31,848,000	33,018,560	34,330,845	36,523,135	37,180,788	172,901,328
NON-SAL. EXPEN.	22,923,753	24,114,199	24,707,774	24,100,252	25,575,020	121,420,998
CAPITAL EXPEN.	4,646,019	4,075,646	6,881,496	4,949,534	2,924,840	23,477,535
STU. FIN. AID	45,742,189	41,226,322	35,729,417	34,637,788	34,310,171	191,645,887
NET WAGES	23,886,000	24,763,920	25,748,134	27,392,351	27,885,591	129,675,996
NON-SALARY, LOCAL	18,912,096	19,894,214	20,383,914	19,882,708	21,099,392	100,172,323
CAPITAL, LOCAL	3,832,966	3,362,408	5,677,234	4,083,366	2,412,993	19,368,966
FTE COLLEGE JOBS	534	557	565	575	570	2,801
NON-LOCAL REVENUE %	62.8%	60.9%	58.4%	61.2%	61.1%	60.9%
TOTAL EXPENDITURES	105,159,961	102,434,727	101,649,532	100,210,709	99,990,819	509,445,748
LOCAL EXPENDITURES	92,373,251	89,246,864	87,538,699	85,996,213	85,708,147	440,863,173
LOCAL EXPENDITURES (NEW)	75,028,346	70,485,380	66,001,499	66,060,978	65,694,108	343,270,310

For the five-year period, \$318.5 million in non-local revenues was brought into the service area, along with \$204.3 million in local revenues, for a combined total of \$523.0 million in revenues.

The five-year average was 60.9 percent non-local and 39.1 percent local revenues.

## RESULTS

### Business Volume Impact

The local business volume impact generated by Pellissippi State expenditures is shown below:

<b>BUSINESS VOLUME IMPACT</b>						
	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>TOTAL</b>
BUSINESS VOLUME	129,322,551	124,945,610	122,554,178	120,394,698	119,991,405	617,208,442
BUSINESS VOLUME (NEW)	105,039,684	98,679,531	92,402,099	92,485,369	91,971,751	480,578,435

The annual business volume impact of total College expenditures ranged from \$120.0 million to \$129.3 million, with a five-year total of \$617.2 million. The impact of external or "new" College revenues ranged from \$92.0 million to \$105.0 million, with a five-year total of \$480.6 million. Figure 4 graphs the relationship between local revenues and both total and "new" business volume generated by the College's presence.

### Employment Impact

The local employment impact in terms of full-time-equivalent (FTE) jobs created and sustained by Pellissippi State expenditures is shown below:

<b>EMPLOYMENT IMPACT</b>						
	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>TOTAL</b>
EMPLOYMENT	8,847.59	8,589.22	8,443.48	8,314.66	8,283.73	42,479
EMPLOYMENT (NEW)	7,087.92	6,683.07	6,270.26	6,297.30	6,260.52	32,599

Pellissippi State's own annual FTE jobs ranged from 534 to 575 during this period, yet the total annual employment created and sustained by College expenditures ranged from 8,284 to 8,848 jobs, with a five year total of 42,479 jobs, including the College's own 2,801 FTE jobs over that period. The number of FTE jobs created annually by external or "new" revenues ranged from 6,261 to 7,088 jobs, with a five year total of 32,599 jobs. Figure 5 graphs the relationship between the College's full-time jobs and both total and "new" full-time-equivalent jobs generated and sustained by the College's presence.

### Individual Income Impact

The local impact of Pellissippi State's expenditures on personal income is calculated using two different multipliers to produce a range of impact, shown below as Type I and Type II. The Type I multiplier is the more conservative measure.

#### INDIVIDUAL INCOME IMPACT

	<u>2012-13</u>	<u>2013-14</u>	<u>2014-15</u>	<u>2015-16</u>	<u>2016-17</u>	<u>TOTAL</u>
TYPE I MULTIPLIER	137,939,952	132,253,206	128,841,511	125,304,607	124,531,669	648,870,946
TYPE II MULTIPLIER	147,028,098	141,675,382	138,638,161	135,726,849	135,141,579	698,210,069
TYPE I (NEW)	114,695,285	107,149,319	99,780,208	98,842,763	98,076,223	518,543,798
TYPE II (NEW)	120,403,001	112,890,279	105,504,375	105,219,518	104,554,703	548,571,876

The total Type I impact of College expenditures on personal income, using the more conservative multiplier, ranged from \$124.5 million to \$137.9 million, with a five-year total of \$648.9 million. The impact of external or "new" revenues ranged from \$98.1 million to \$114.7 million, with a five-year total of \$518.5 million. Figure 6 graphs the relationship between local revenues and both total and "new" Type I personal income generated by the College's presence.

In summary, the combined five-year direct economic impact on the community (business volume plus individual income) represents \$1.27 billion, or an average of \$253.2 million per year,

plus the creation of 42,479 jobs. Of this amount, \$999.1 million, or \$199.8 million per year, was due to the infusion of "new", external/non-local revenues. This impact would likely not have occurred without the presence of Pellissippi State in the area.

**It is significant to note that for every \$1.00 of local revenues coming to Pellissippi State, there was \$3.02 of local business volume and from \$3.18 to \$3.42 of individual income generated, for a total return on investment (ROI) of \$6.20 to \$6.44 on the local dollar!**

### **ECONOMIC BENEFITS OF HIGHER EDUCATION**

Many national and state research studies have demonstrated the economic value of increased levels of education. There is a clear relationship established between increased levels of education and increased annual incomes and lifetime earnings.

As a 2007 study of the impact of Middle Tennessee higher education institutions states, "It appears that knowledge, either in the form of human capital or technological advancement, has become the common denominator in much economic growth and regional competitiveness literature."<sup>1</sup>

Several national research studies have been completed that specifically focus on the economic benefits of two-year associate's degree programs conferred by community colleges. As one such study says, "While community colleges serve many goals and missions, their occupational purposes are central, and virtually all their students enroll in order to enhance their employment, either directly or by later transferring to 4-year colleges."<sup>2</sup>

This same compilation of a dozen national studies of the effect of associate's degrees on employment outcomes concluded that "completing Associate degrees generally enhances wages, employment, and earnings by significant amounts..."<sup>3</sup> Another such study entitled "Education

Pays: The Benefits of Higher Education for Individuals and Society” conducted by The College Board, further concludes that “there is a correlation between higher levels of education and higher earnings for all racial/ethnic groups and for both men and women.”<sup>4</sup>

Most studies of this nature contrast the annual and lifetime earnings potential of associate’s degree graduates compared with high school diploma holders. Lifetime earnings generally mean the cumulative earnings over a 40 year work life from about age 25-64.

The literature indicates a range of lifetime earnings ratios between associate’s degree graduates and high school diploma holders, generally in the range of 20-30% higher, at a minimum, for associate’s degree graduates.<sup>5</sup> This income gap between high school and college graduates has also increased significantly over time.<sup>6</sup>

In terms of average annual earnings by associate’s degree and high school diploma holders, the literature also contains a range of findings. The College Board study referenced earlier cites an average annual earnings differential of \$6,800, (\$37,600 for Associate degree holders vs. \$30,800 for high school diploma holders),<sup>7</sup> while a more recent U. S. Census Bureau study indicates an even greater difference of \$11,033 (\$32,602 vs. \$21,569).<sup>8</sup>

A 2007 study conducted by the University of Tennessee Center for Business and Economic Research found that, over the seven year period from 1997 to 2005, associate’s degree graduates in Tennessee earned \$33,326 on average one year after graduation, growing to \$38,952 four years later and to \$42,921 after seven years, for an average annual growth rate of 4.3%.<sup>9</sup>

A 2013 study revealed even higher first year earnings (\$38,945) for Tennessee associate’s degree completers. Also significant was the finding that Tennessee associate’s degree completers had higher first year earnings than did bachelor’s degree completers.<sup>10</sup>

A 2012 study by the American Association of Community Colleges (AACC) found that

the average associate's degree graduate in the U. S. should earn about \$10,700 per year more than someone with a high school diploma.<sup>11</sup> Over an average work lifetime, that amounts to about **\$470,800** in increased lifetime earnings potential for associate's degree graduates compared with high school graduates.

### **ECONOMIC BENEFITS APPLIED TO PELLISSIPPI STATE GRADUATES**

During 2012-2017, Pellissippi State graduated 6,797 students with two-year associate's degrees, as seen below:

#### Associate's Degree Graduates

2012-13	1,260
2013-14	1,286
2014-15	1,367
2015-16	1,429
2016-17	<u>1,455</u>
Total	6,797

Graduates typically either transfer on to four year institutions to continue their education or they seek immediate employment. The job placement rates for those Pellissippi State career/technical graduates who seek employment have been tracked as follows:

#### Job Placement Rates

2012	96%
2013	94%
2014	95%
2015	94%
2016	92%

An estimate of projected lifetime earnings of a class of Pellissippi State associate's degree graduates can be gained using average national figures. The 2012 AACC study referenced earlier found a difference of about \$470,800 in lifetime earnings between associate's degree graduates

and high school diploma holders. Taking the 1,455 graduates making up the class of 2016-17, for example, and applying the \$470,800 excess lifetime earnings of associate's degree graduates over high school diploma holders, one arrives at a figure of **\$685.0 million** that this class alone could potentially earn over their high school diploma counterparts.

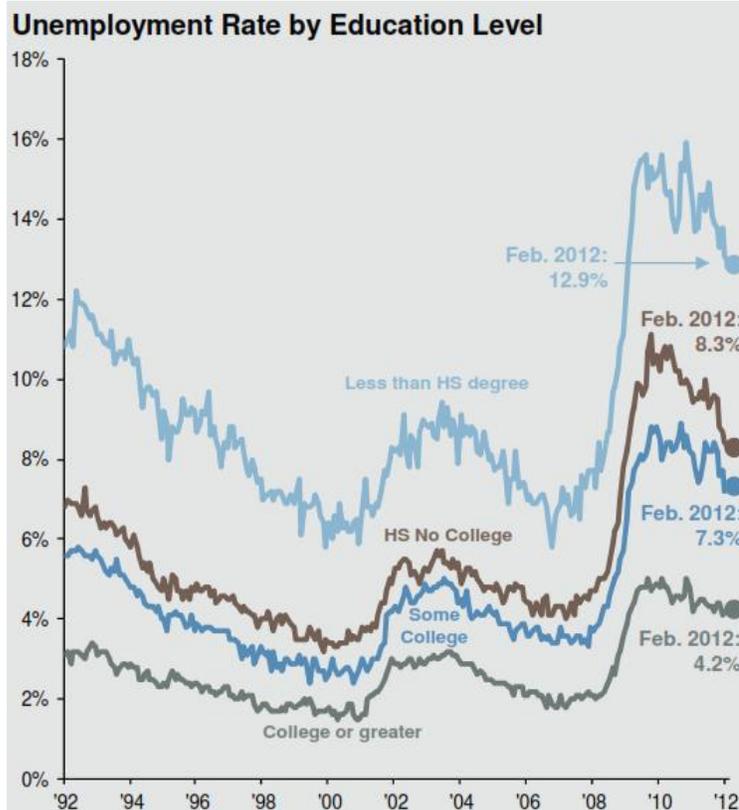
Pellissippi State typically draws the great majority of its students from its two-county primary service area. For example, in the spring semester of 2017, 78 percent of the credit headcount students came from Knox and Blount County.

The 2007 University of Tennessee study referenced earlier found that those earning associate's degrees were much more likely to stay and work in Tennessee than were other degree-earners. In fact, after one year, 73.3% of associate's degree earners were working in Tennessee, compared with 62.4% of bachelor's degree earners and 40.0% of doctoral degree earners.<sup>12</sup>

Assuming the majority of Pellissippi State's graduates have remained in the area, the economic impact of each succeeding graduating class over their earnings lifetime has been and will continue to be an enormous contributor to local economic activity.

Along with the individual economic benefits associated with greater wages and earnings, there are also corresponding societal economic benefits that come from increased levels of local, state, and federal tax payments. The College Board study indicates, for example, average annual tax payments of \$8,600 for associate's degree holders vs. \$6,700 for high school degree holders, a difference of \$1,900 per year.<sup>13</sup> Applying that figure just to the 1,455 Pellissippi State associate's degree graduates in 2016-17 would generate an estimate of **\$2,764,500** in increased annual tax payments to local, state, and federal governments, plus the "multiplier effect" of these taxes as they are circulated in the local, state and national economy.

Yet another indicator of the economic impact of education can be seen by comparing data on unemployment rates. A 2012 study of unemployment rates shows the following:



Source: BLS, FactSet, J. P. Morgan Asset Management, 2012

A consistent trend is seen since 1992, with highest unemployment rates for people with less than a high school degree, followed by people with a high school degree but no college, then those with some college, and lowest for those with a college degree.

## **SOCIAL BENEFITS**

Many studies of the value of higher education identify broader benefits to society at large, in addition to the considerable economic benefits to the individual. Some of these societal

benefits of increased levels of higher education include:

1. Increased likelihood of attending a 4-year college. Students who enroll in public two-year colleges increase their likelihood of attending a four-year institution by 5-10%,<sup>14</sup>
2. Lower levels of unemployment as educational attainment increases,<sup>15</sup>
3. Reduced poverty rates, particularly for single mother and married couple families with children,<sup>16</sup>
4. Less dependence on social “safety-net” programs, resulting in less demand on public budgets,<sup>17</sup>
5. Improved perceptions of personal health, along with reduced smoking rates<sup>18</sup>, lower rates of alcohol abuse and health-related absenteeism, and longer life spans,<sup>19</sup>
6. Reduced levels of crime and incarceration rates, along with reductions in victim costs (It costs about \$24,532 per year to maintain a prisoner in Tennessee, whereas it only costs the state about \$3,864 per year to educate a student at Pellissippi State),<sup>20</sup>
7. Higher cognitive skill levels and greater ability to persist at tasks for young children of mothers with more education,<sup>21</sup>
8. Higher levels of participation in civic and volunteer activities, including voting and blood donation,<sup>22</sup> and
9. Increased levels of home ownership.<sup>23</sup>

These broader societal benefits tend to apply similarly across all gender, racial and ethnic student groups, as did the economic benefits.

## CONCLUSIONS

The results of this economic and social impact study clearly demonstrate that Pellissippi State Community College continues to be a major contributor to the economic bases of Knox and Blount Counties. In addition to the more implicit impact of a community college on the improved productivity and quality of life achieved through increased education, the explicit economic impact noted here is significant. This economic impact is expressed here in terms of jobs created, business volume generated and personal income earned.

Additionally, it has been demonstrated that a two-year graduate can expect to earn significantly more over their work lifetime than can a high school diploma holder, as well as to pay considerably more local, state and federal taxes. Also, research indicates lower unemployment rates for people with college degrees than with high school degrees. Finally, there are demonstrated social benefits to increased levels of education that accrue to the broader society, in addition to the more personal economic benefits.

As Pellissippi State continues to grow in enrollment and/or budget, its economic and social impact on the Knoxville metropolitan area will increase similarly. The College continues to be a major partner and force in the economic vitality of the Knoxville metropolitan area.

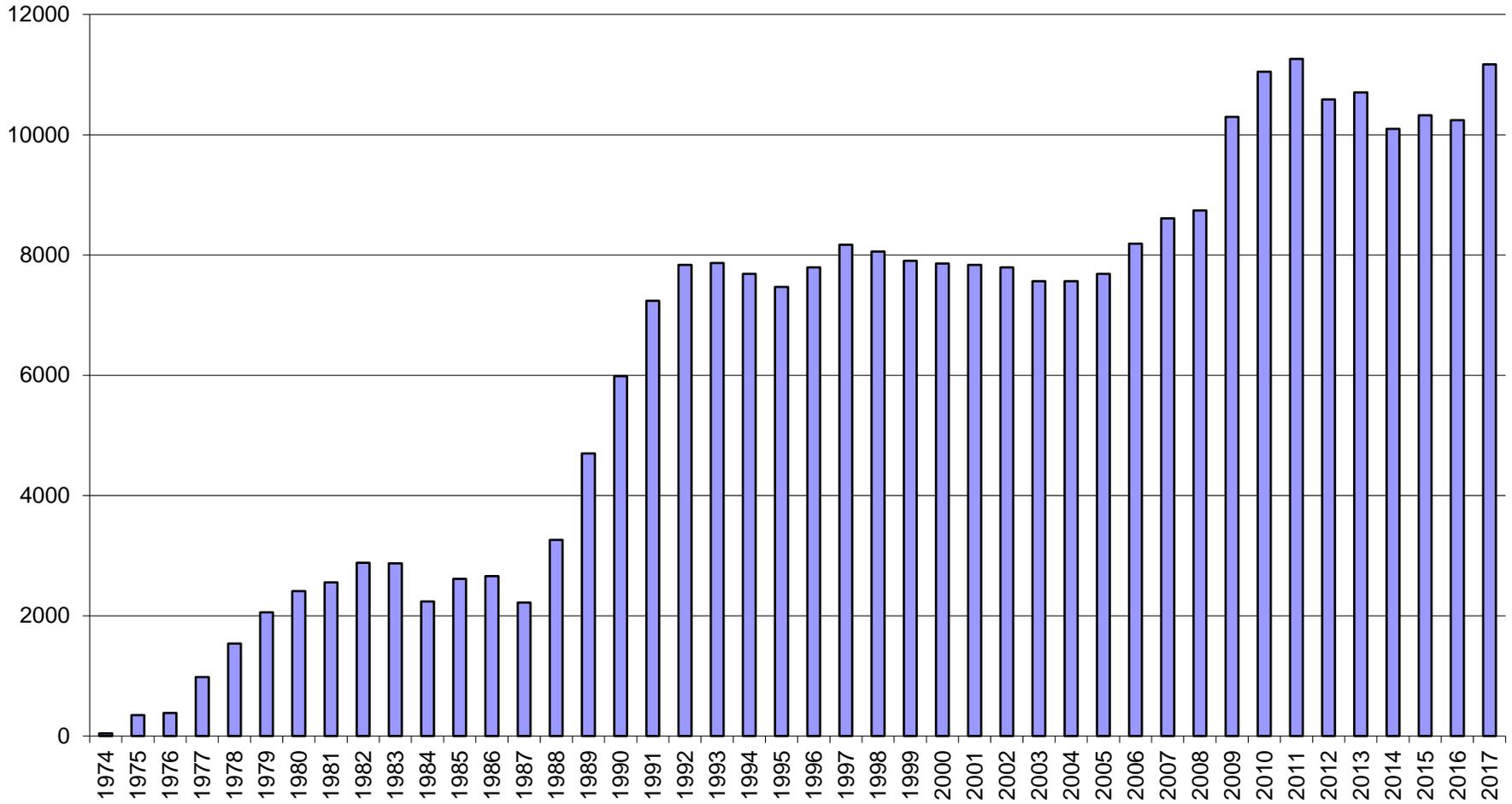
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**Figure 1**

**Student Headcount**



**Figure 2**

**Circular Cash Flow Model**

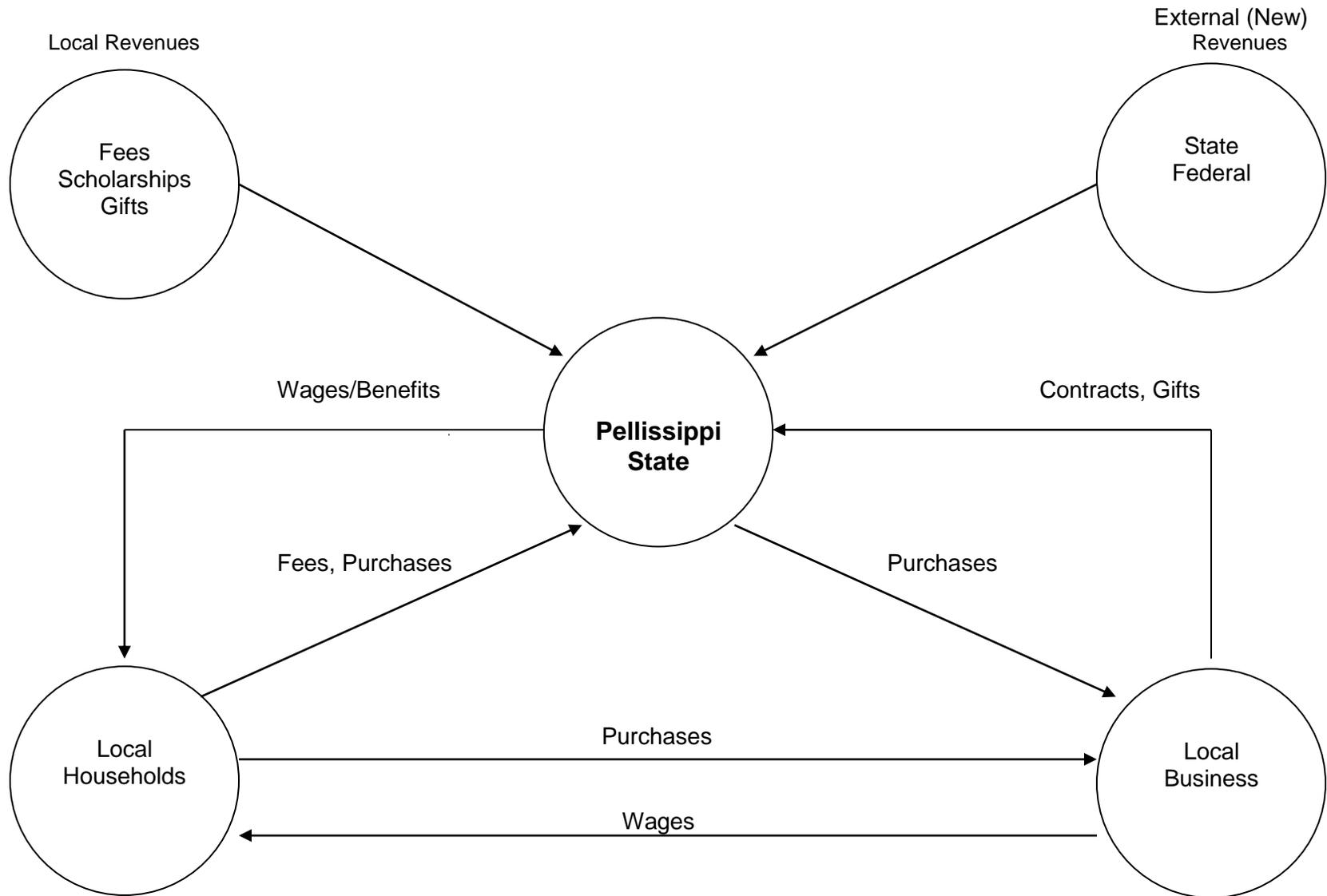
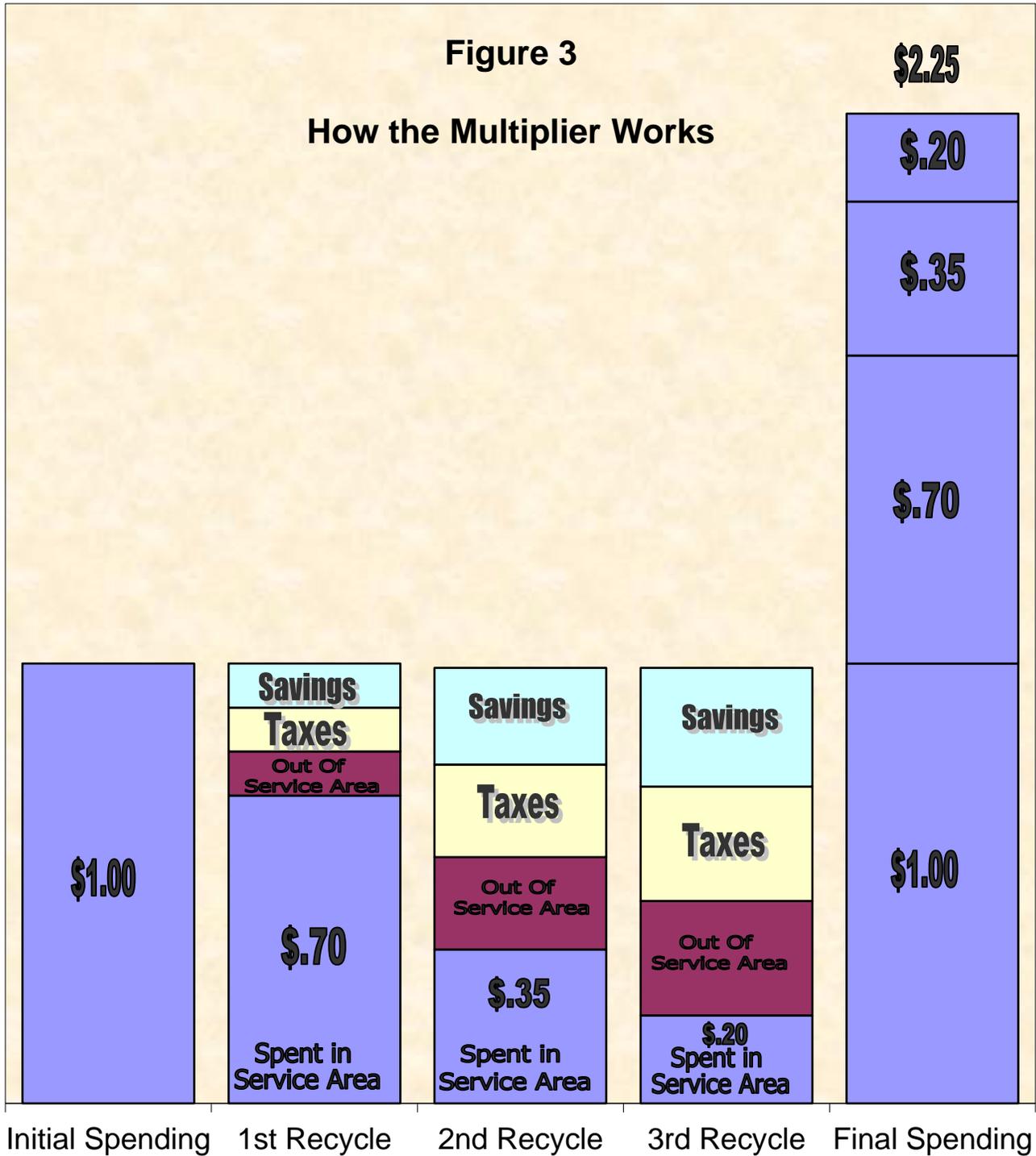


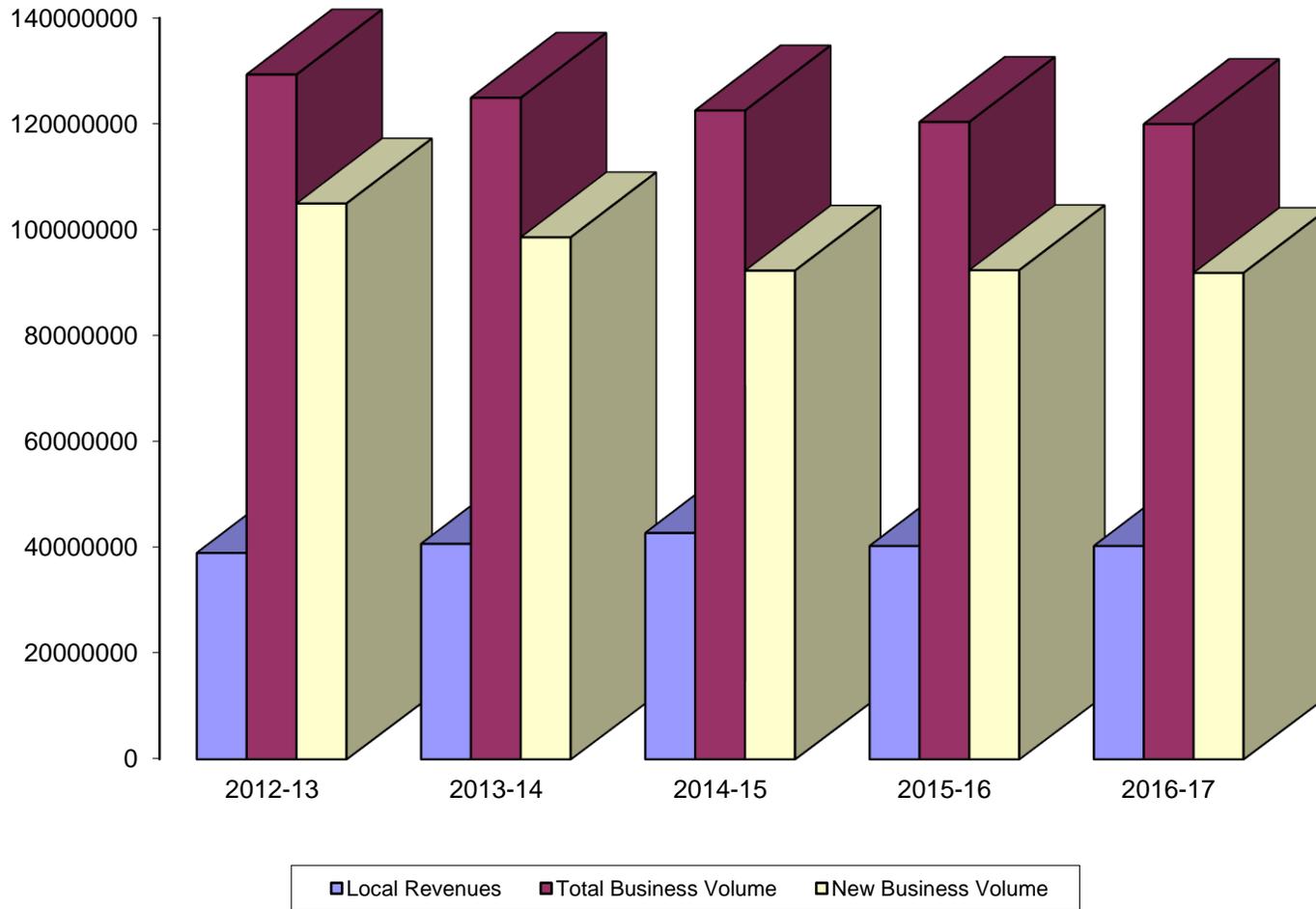
Figure 3

How the Multiplier Works



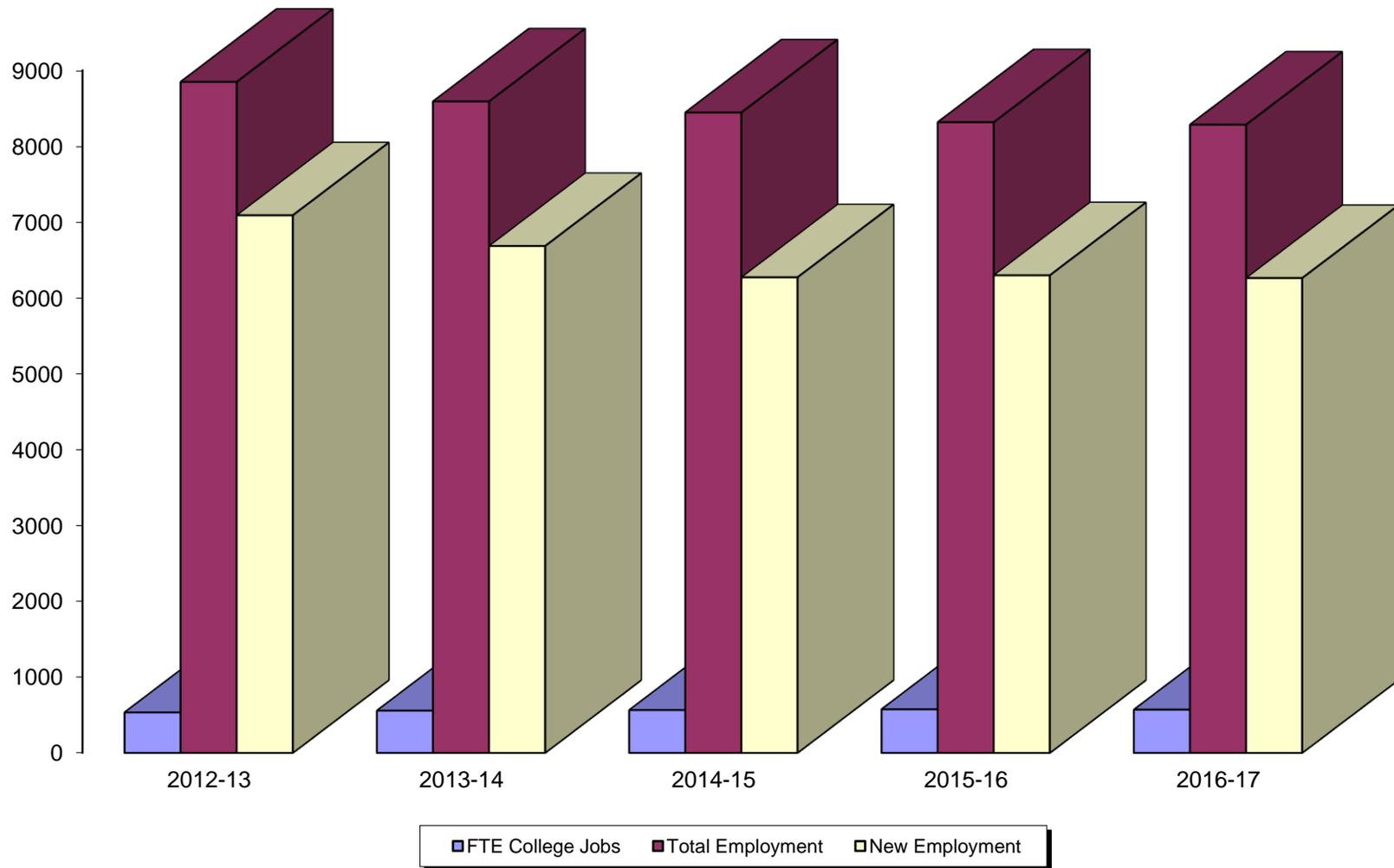
**Figure 4**

**Business Volume Impact**



**Figure 5**

**Employment Impact**



**Figure 6**

**Individual Income Impact**

