

# The Economic and Fiscal Contribution of the Emerging Technology Center's Tenants and Graduates to the Baltimore City and Maryland Economy

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## Executive Summary

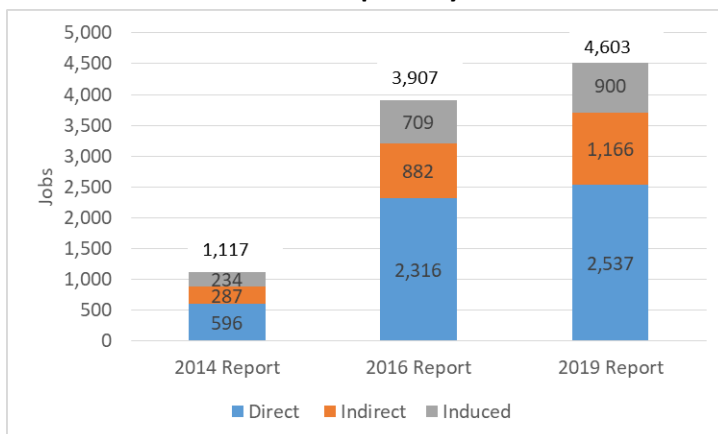
The ETC (Emerging Technology Center), a 501(c)(3) venture of the Baltimore Development Corporation (BDC) focused on tech-based economic development, retained the Jacob France Institute of the Merrick School of Business at the University of Baltimore (JFI) to analyze the economic and fiscal contribution of its current tenants and graduates on the economies of Baltimore City and Maryland. For the purpose of this analysis, only companies that were either current tenants or had graduated from the ETC as of December 31<sup>st</sup>, 2018 are included in this analysis. The key findings of this analysis are as follows:

### **Baltimore City Impacts**

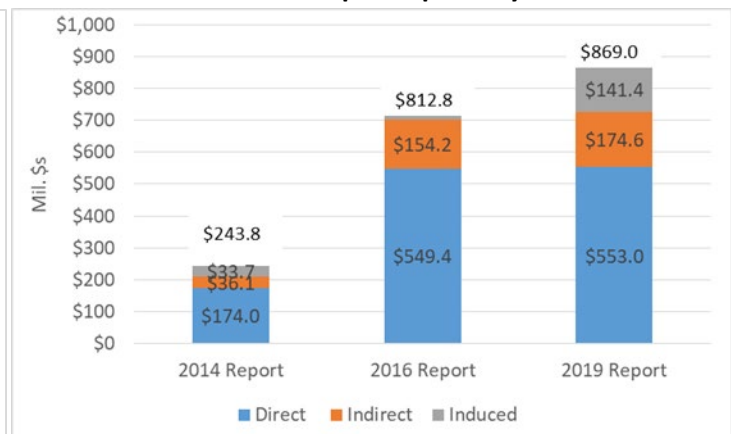
JFI analyzed the economic and fiscal contributions of the 265 ETC tenant and graduate companies currently operating in Baltimore City. These companies make the following contributions to the Baltimore City economy:

- In total, the 265 ETC tenant and graduate companies have total estimated revenues of \$553.0 million and employ an estimated 2,537 workers. This business activity generates an estimated \$869.0 million in City economic activity, supports 4,603 jobs in the City, earning \$394.1 million in labor income and supports \$29.0 million in combined State and City government revenues;
- The 48 ETC tenant companies have total estimated revenues of \$46.1 million and employ an estimated 220 workers. This business activity generates an estimated \$74.4 million in City economic activity, supports 401 jobs in the City, earning \$33.5 million in labor income and supports \$2.2 million in combined State and City government revenues;
- The 217 ETC graduate companies located in the City have total estimated revenues of \$506.9 million and employ an estimated 2,317 workers. This business activity generates an estimated \$794.6 million in City economic activity, supports 4,202 jobs in the City, earning \$360.6 million in labor income and supports \$26.8 million in combined State and City government revenues; and
- The total Baltimore City jobs created by ETC's tenant and graduate companies has increased from 1,117 jobs in the 2014 study done by the JFI and 3,907 in the JFI's 2016 Study to 4,603 in this 2019 study and the total Baltimore City business activity supported by ETC tenant and graduate companies has increased from \$243.8 million in the 2014 study and \$812.8 million in 2016 to \$869.0 million in 2019.

**Figure 1: Baltimore City ETC Tenant and Graduate Job Impacts by Year**



**Figure 2: Baltimore City ETC Tenant and Graduate Output Impacts by Year**



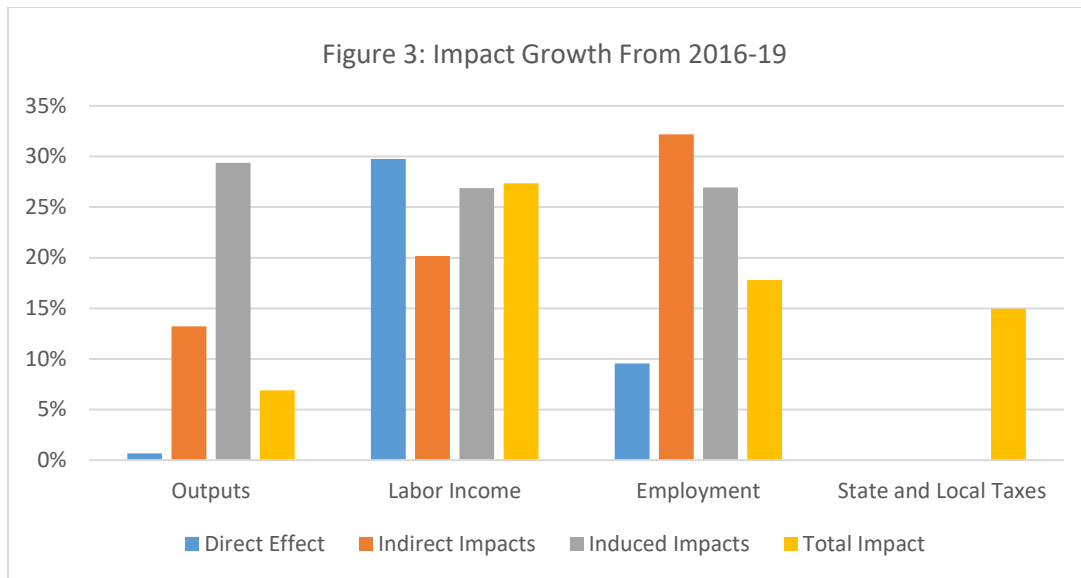
**Table ES-1: ETC Baltimore City Impacts 2014, 2016 and 2019 Studies**

	Output (\$s)	Labor Income (\$s)	Employment	State/Local Tax Revenue (\$s)
<b>Total Impact 2019 - ETC Tenants and Graduates</b>				
Direct Effect	\$553,040,099	\$263,579,777	2,537	\$14,719,369
Indirect Impacts	\$174,585,152	\$79,118,701	1,166	\$6,552,672
Induced Impacts	\$141,352,353	\$51,430,088	900	\$7,726,496
<b>Total Impact</b>	<b>\$868,977,604</b>	<b>\$394,128,566</b>	<b>4,603</b>	<b>\$28,998,537</b>
<b>Total Impact 2016 - ETC Tenants and Graduates</b>				
Direct Effect	\$549,366,521	\$203,119,620	2,316	n/a
Indirect Impacts	\$154,188,536	\$65,834,656	882	n/a
Induced Impacts	\$109,262,084	\$40,532,220	709	n/a
<b>Total Impact</b>	<b>\$812,817,141</b>	<b>\$309,486,496</b>	<b>3,907</b>	<b>\$25,222,270</b>
<b>Total Impact 2014 - ETC Tenants and Graduates</b>				
Direct Effect	\$173,958,731	\$59,991,517	596	n/a
Indirect Impacts	\$36,097,597	\$18,271,871	287	n/a
Induced Impacts	\$33,719,717	\$13,577,608	234	n/a
<b>Total Impact</b>	<b>\$243,776,045</b>	<b>\$91,840,996</b>	<b>1,117</b>	<b>\$6,176,801</b>
Source JFI and IMPLAN				

Since the 2016 study, the total impact ETC Tenants and Graduates have on the City of Baltimore has grown. This growth is highlighted in the following Table and Figure:

**Table ES-2 Change in Baltimore City ETC Impacts 2016-2019**

<b>Total Impact Growth(2016-19)</b>	<b>Outputs</b>	<b>Labor Income</b>	<b>Employment</b>	<b>State and Local Taxes</b>
<b>Direct Effect</b>	<b>1%</b>	<b>30%</b>	<b>10%</b>	<b>n/a</b>
<b>Indirect Impacts</b>	<b>13%</b>	<b>20%</b>	<b>32%</b>	<b>n/a</b>
<b>Induced Impacts</b>	<b>29%</b>	<b>27%</b>	<b>27%</b>	<b>n/a</b>
<b>Total Impact</b>	<b>7%</b>	<b>27%</b>	<b>18%</b>	<b>15%</b>



***The economic activity supported by ETC tenant and graduate companies is important to the City of Baltimore.*** The 4,603 jobs directly and indirectly supported by ETC tenant and graduate companies account for approximately 1% of all jobs in the City and have average employee compensation of \$74,350, which is higher than the City average of \$68,000. The JFI estimates that the total City government revenues associated with the operations of ETC's tenant and graduate companies accounts for \$13.8 million of the \$29.0 million in combined State and local government revenues accrues to the City. ETC companies are also a vital part of the City and region's innovation-based industry cluster, having raised over \$2.2 billion in funding and investment to grow their operations.

The overall \$56,160,463 gain in Outputs, \$84,642,070 gain in Labor Income, 696 gain in Employment, and \$3,776,267 gain in State and Local Taxes made by ETC Companies and Graduates since the 2016 Impact Study were made possible in significant part through an average annual subsidy provided by Baltimore City taxpayers. Since the 2016 study, which was inclusive of ETC tenant and graduate companies through April 2016, Baltimore City taxpayers have provided the ETC with \$2,243,024.33 to subsidize the cost of ETC's operations. This subsidy is provided as follows:

**Table ES-3 ETC's Baltimore City Tax Subsidy 2016-2019**

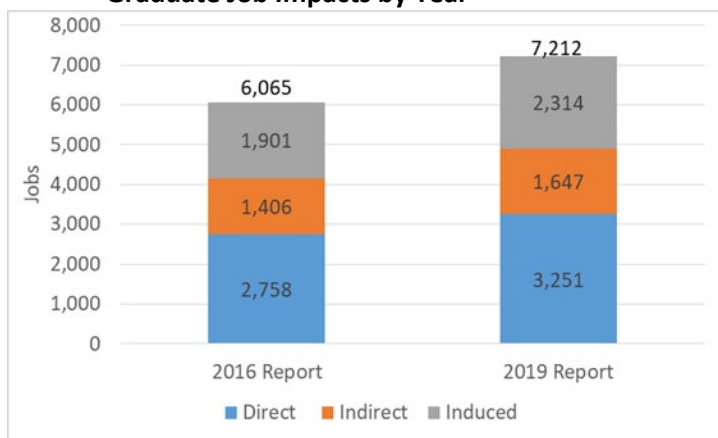
Fiscal Year	Subsidy Received
FY'16(May-June 2016)	\$ 135,859.33
FY'17	\$ 831,459.00
FY'18	\$ 849,751.00
FY'19 (July-Dec 2018)	\$ 425,955.00
Total	\$ 2,243,024.33

### **Maryland Impacts**

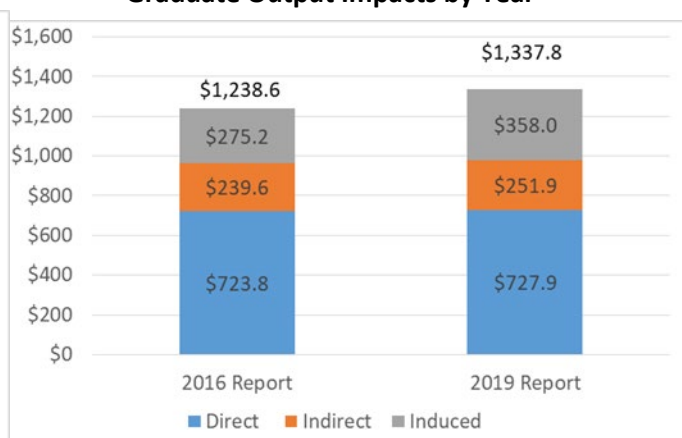
The JFI analyzed the economic and fiscal contributions of the 376 ETC tenant and graduate companies currently operating in Maryland. This number is inclusive of the companies located within Baltimore City. These companies make the following contributions to the Maryland economy:

- In total, the 376 ETC tenant companies located in Maryland employ an estimated 3,251 workers while having total estimated revenues of \$727.9 million. This business activity generates \$1.3 billion in Maryland economic activity, supports 7,212 jobs in the State, earning \$571.9 million in labor income and supports \$58.0 million in combined State and local government revenues;
- The 48 ETC tenant companies have total estimated revenues of \$46.1 million and employ an estimated 220 workers. This business activity generates an estimated \$87.8 million in Maryland economic activity, supports 489 jobs in the State, earning \$37.5 million in labor income and supports \$3.7 million in combined State and local government revenues;
- The 328 ETC graduate companies located in Maryland have total estimated revenues of \$681.8 million and employ 3,031 workers. This business activity generates an estimated \$1.2 billion in Maryland economic activity, supports 6,723 jobs in the City, earning \$534.5 million in labor income and supports \$54.3 million in combined State and local government revenues; and
- The JFI last analyzed the statewide economic activity associated with ETC tenant and graduate companies in 2016. Since that study, the total estimated number of Maryland jobs supported by ETC tenant and graduate companies has increased from 6,065 to 7,212 and the Maryland economic activity supported by these firms increased from \$1.2 billion to \$1.3 billion.

**Figure 4: Maryland ETC Tenant and Graduate Job Impacts by Year**



**Figure 5: Maryland ETC Tenant and Graduate Output Impacts by Year**



**Table ES-4: ETC Maryland Impacts 2016<sup>1</sup> and 2019 Studies**

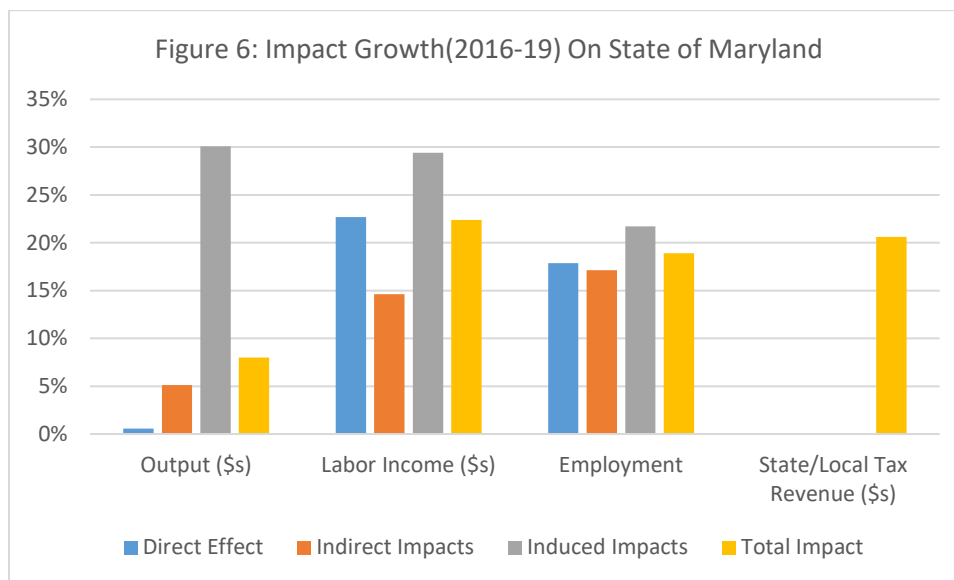
	Output (\$s)	Labor Income (\$s)	Employment	State/Local Tax Revenue (\$s)
<b>Total Impact 2019 - ETC Tenants and Graduates</b>				
Direct Effect	\$727,943,549	\$340,728,882	3,251	\$22,566,945
Indirect Impacts	\$251,867,248	\$109,650,005	1,647	\$11,677,061
Induced Impacts	\$357,980,952	\$121,566,663	2,314	\$23,735,152
<b>Total Impact</b>	<b>\$1,337,791,749</b>	<b>\$571,945,550</b>	<b>7,212</b>	<b>\$57,979,158</b>
<b>Total Impact 2016 - ETC Tenants and Graduates</b>				
Direct Effect	\$723,761,983	\$277,733,395	2,758	n/a
Indirect Impacts	\$239,601,315	\$95,667,737	1,406	n/a
Induced Impacts	\$275,210,244	\$93,929,666	1,901	n/a
<b>Total Impact</b>	<b>\$1,238,573,543</b>	<b>\$467,330,799</b>	<b>6,065</b>	<b>\$48,076,603</b>
(1) State impacts not analyzed in 2014.				

Source: JFI and IMPLAN

Since the 2016 study, the total impact ETC Tenants and Graduates have on the State of Maryland has grown. This growth is highlighted in the following Table and Figure:

**Table ES-5: Change in Maryland ETC Impacts 2016-2019**

Total Impact Growth (2016-19)	Output (\$s)	Labor Income (\$s)	Employment	State/Local Tax Revenue (\$s)
Direct Effect	1%	23%	18%	n/a
Indirect Impacts	5%	15%	17%	n/a
Induced Impacts	30%	29%	22%	n/a
<b>Total Impact</b>	<b>8%</b>	<b>22%</b>	<b>19%</b>	<b>21%</b>



The overall \$99,218,206 gain in Outputs, \$104,614,751 gain in Labor Income, 1147 gain in Employment, and \$9,902,555 gain in State and Local Taxes were made possible in significant part through an average annual subsidy provided by the City of Baltimore of approximately \$830,000.00 over the past five fiscal years and through average annual support via the Maryland Business Innovation Association/TEDCO of approximately \$15,000 in grants. This allowed the ETC to support its current tenants and graduate companies to making these gains for the State. As shown on Table ES-3, Baltimore City taxpayers have provided the ETC with \$2,243,024 to subsidize the cost of ETC's operations.

## Introduction and Methodology

The ETC (Emerging Technology Center), a 501(c)(3) venture of the Baltimore Development Corporation (BDC), retained the Jacob France Institute of the Merrick School of Business at the University of Baltimore (JFI) to update its prior analyses of the economic contribution of its current tenants and graduates on the Baltimore City and Maryland economies.

### Economic Impact Methodology

The JFI used the IMPLAN models for the Baltimore City and the State of Maryland to estimate the economic contribution of ETC's current tenants and graduates. The IMPLAN input-output model can be used to estimate the economic and fiscal contributions of projects, companies or of entire industries on a state, regional, or county economy. An IMPLAN analysis can be based on the revenues and/or the jobs associated with an event, program or an industry. The inputs to this analysis are the employment levels of the ETC's tenant and graduate companies.<sup>1</sup>

The economic activity generated in a city, county, region or state is greater than the simple total of spending associated with the event or activity being studied. This is because as this money is earned, it is, in turn, spent, earned and re-spent by other businesses and workers in the local economy through successive cycles of spending, earning and spending. However, the spending in each successive cycle is less than in the preceding cycle because a certain portion of spending "leaks" out of the economy in each round of spending. Leakages occur through purchases of goods or services from outside of the region and federal taxation. The IMPLAN multipliers used in this analysis capture the effects of these multiple rounds of spending. This analysis focuses on four measures of economic impact:

- **Output.** The total value of production or sales in all industries;
- **Employment.** The total number of full and part time jobs in all industries;
- **Labor Income.** The wages and salaries, including benefits, and other labor income earned by the workers holding the jobs created; and
- **State and Local Government Revenues.** The fiscal benefits accruing to both state and local governments in Maryland as a result of the direct and multiplier impacts associated with ETC's tenant and graduate companies.

Four measures of the economic impacts and fiscal impacts of ETC's tenant and graduate companies are presented in this report:

- **Direct effects.** The change in economic activity being analyzed—in this case portfolio of ETC tenant companies operating in Baltimore City and the state of Maryland;
- **Indirect effects.** The changes in inter-industry purchases, for example the purchase of research supplies by a start-up company;
- **Induced effects.** The changes in spending from households as income and population increase due to changes in production; and
- **Total effects.** The combined total of direct, indirect and induced effects.

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<sup>1</sup> The ETC provide a database of 432 currently operating tenant (48 companies) and graduate (384 companies). When data on industry (North American Industrial Classification – NAICs) or employment was missing from the database, the JFI identified missing values based on commercial company databases (for industry and employment) and internet searches (for industry). Where missing values could not be identified based on these methods, employment was estimated based on the median employment for the class of company and industry affiliation was estimated based on the classifications for companies for which data were available.



The input to the IMPLAN modeling was the employment of the portfolio of the ETC's tenant and graduate companies provided by ETC. This data reflects tenant and graduate businesses as of December 31<sup>st</sup>, 2018. For the purpose of this analysis, a current ETC tenant is defined as a company is an active member of ETC's programming portfolio and has been active prior to December 31<sup>st</sup>, 2018. An ETC graduate company is defined as a company who was a member of ETC's programming portfolio and left the program prior to December 31<sup>st</sup>, 2018. This analysis is not inclusive of companies that joined an ETC program at any time after December 31<sup>st</sup>, 2018.

IMPLAN was used to estimate revenues and economic activity based on company employment and sector. Company employment figures and industry were based on the data provided by ETC, business databases, and internet searches; with missing values estimated by the JFI. As presented Figure 5, Figure 6 and Appendix Table 1, ETC has a total of 48 tenant firms (all located in Baltimore City)<sup>2</sup> and 384 Graduate firms as of December 31<sup>st</sup>, 2018, of which, 217 are located in Baltimore City and 111 are located in other Maryland jurisdictions. These firms have an estimated total of 3,719 employees, with 3,251 located in Maryland and 2,537 located in Baltimore City. Since the prior, 2016 version of this report:

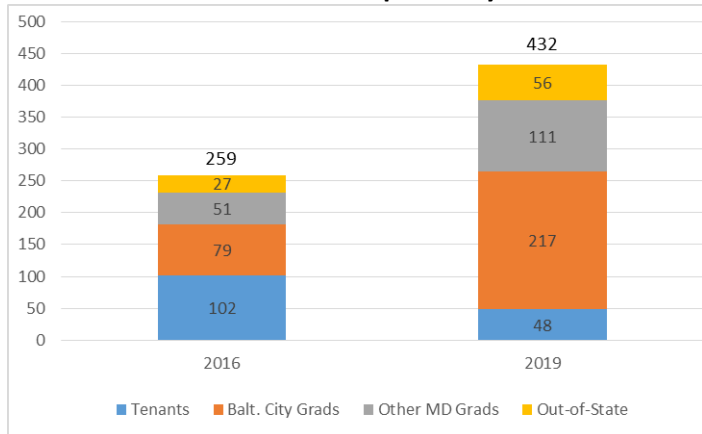
- The number of ETC tenant and graduate companies has increased from 259 companies to 432 companies with 3,032 jobs;
- The number of Maryland companies has increased from 232 companies with 2,758 jobs to 376 companies with 3,251 employees; and
- The number of Baltimore City companies has increased from 181 companies with 2,316 jobs to 265 companies with 2,537 employees.

This data is visually illustrated on the following page via Figures 7-10.

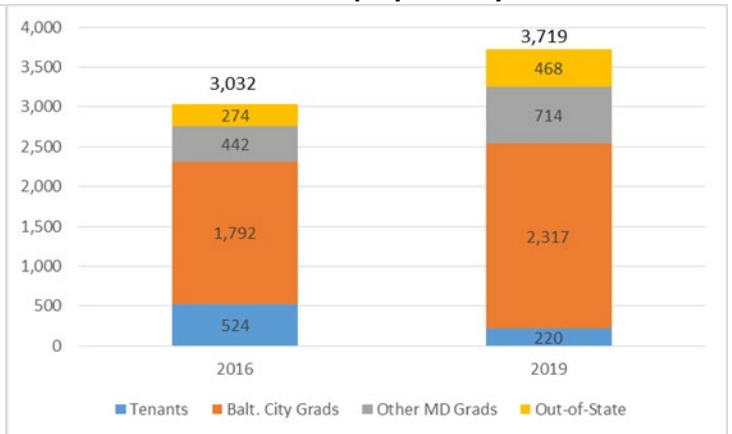
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<sup>2</sup> Please note ETC closed its Eastern Avenue facility, and as a result, the number of tenant companies is lower than in prior report.

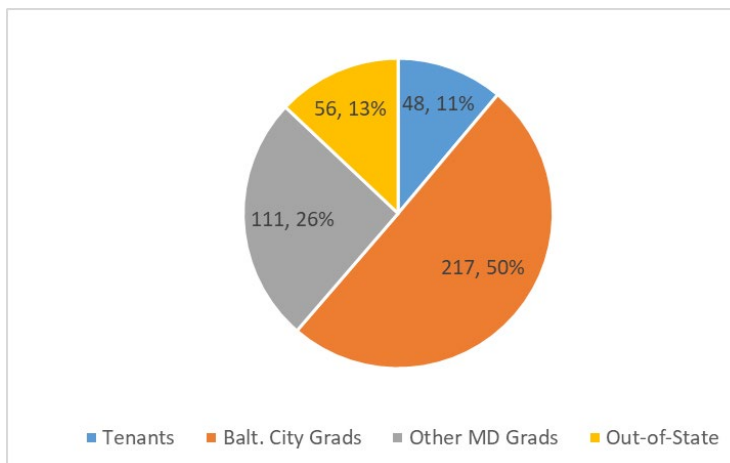
**Figure 7: Maryland ETC Tenant and Graduate Companies by Year <sup>3</sup>**



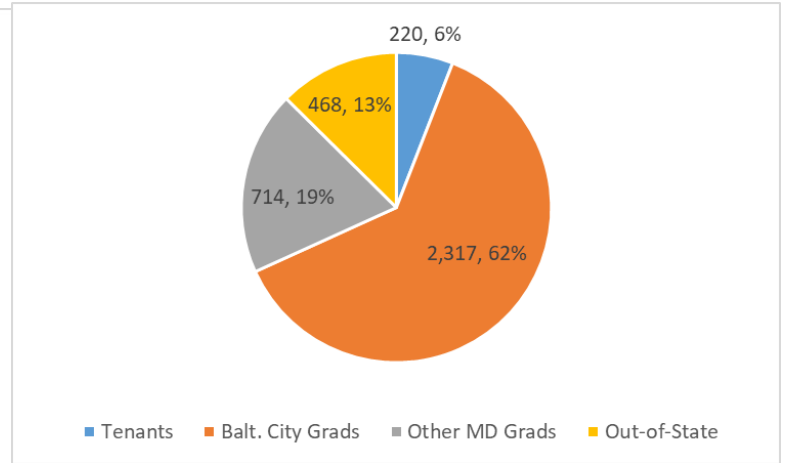
**Figure 8: Maryland ETC Tenant and Graduate Employment by Year**



**Figure 9: Maryland ETC Tenant and Graduate Companies by Type**



**Figure 10: Maryland ETC Tenant and Graduate Employment by Type**



<sup>3</sup> Note, the decline in current ETC tenants from the 2016 to 2019 studies is attributable to the shutdown of ETC's Eastern Facility. In prior studies, the ETC operated out of two locations. During the middle of calendar year 2018, the ETC closed one of its facilities. Those companies became ETC graduates. Since that time, the number of current ETC tenants have grown to 80. However, given this growth did not occur until calendar year 2019, these companies are not included in this study.

## Economic and Fiscal Contribution of the Emerging Technology Center's Tenants and Graduates to the Baltimore City Economy

The JFI analyzed the estimated economic and fiscal contribution of the 265 ETC tenant and graduate companies currently operating in Baltimore City. These companies make the following contributions to the Baltimore City economy (See Appendix Table 2 for the full results):

- In total, the 265 ETC tenant and graduate companies located in the City support an estimated \$869.0 million in City economic activity, consisting of \$553.0 million in direct revenues, \$174.6 million in *Indirect Impacts*, from the purchase of goods and services from City suppliers to support their operations, and \$141.4 million in *Indirect Impacts*, from the salaries and wages paid to their and supplier employees. This business activity supports 4,603 jobs in the City, earning \$394.1 million in labor income and supports \$29.0 million in combined State and City government revenues (Figures 11-14);
- The 48 ETC tenant companies located in the City have total estimated revenues of \$46.1 million and employ an estimated 220 workers. This business activity generates an estimated \$74.4 million in City economic activity, supports 401 jobs in the City, earning \$33.5 million in labor income and supports \$2.2 million in combined State and City government revenues (Figures 15-18); and
- The 217 ETC graduate companies located in the City have total estimated revenues of \$506.9 million and employ 2,317 workers. This business activity generates an estimated \$794.6 million in City economic activity, supports 4,202 jobs in the City, earning \$360.6 million in labor income and supports \$26.8 million in combined State and City government revenues (Figures 19-22).

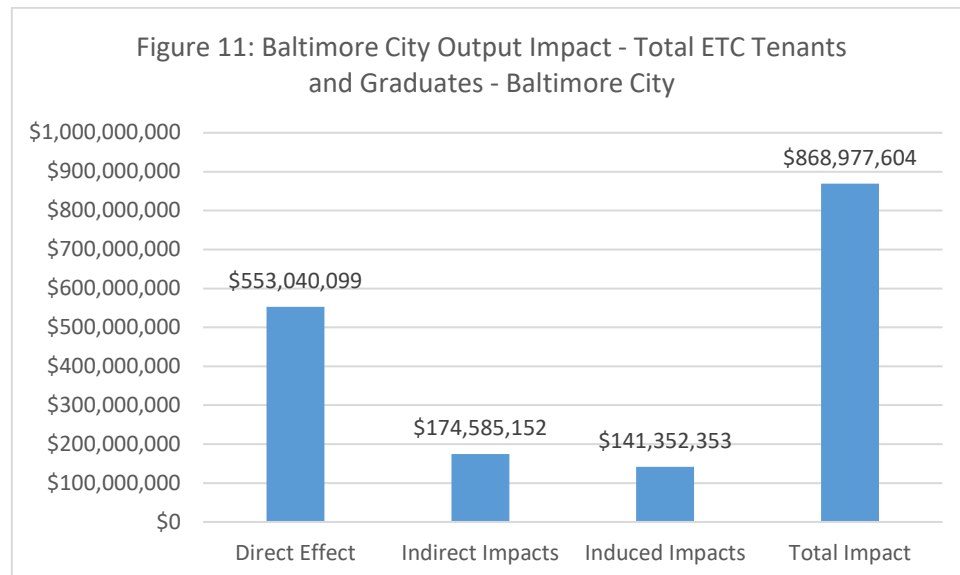


Figure 12: Labor Income Impact - Total ETC Tenants and Graduates - Baltimore City

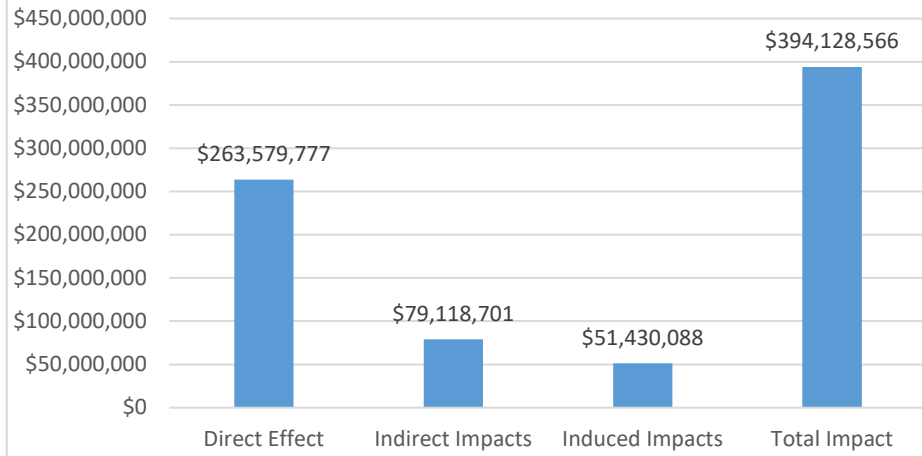


Figure 13: Employment Impact - Total ETC Tenants and Graduates - Baltimore City

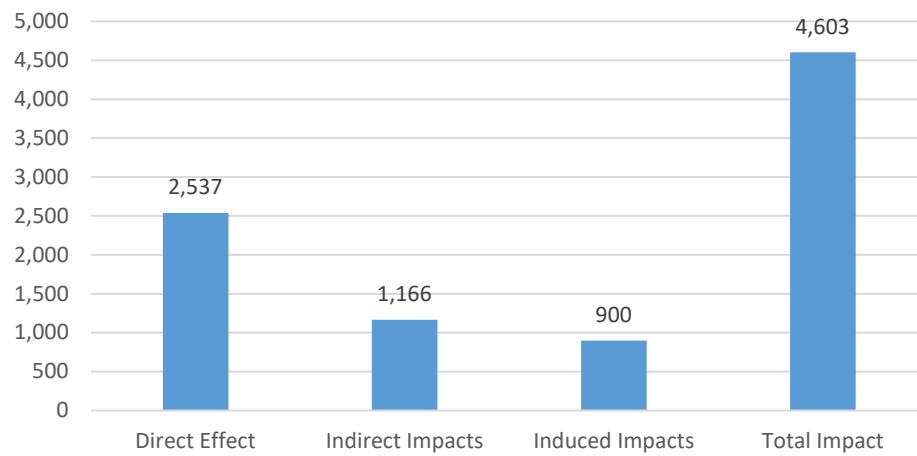


Figure 14: State and Local Gov't Revenue Impact - Total ETC  
Tenants and Graduates - Baltimore City

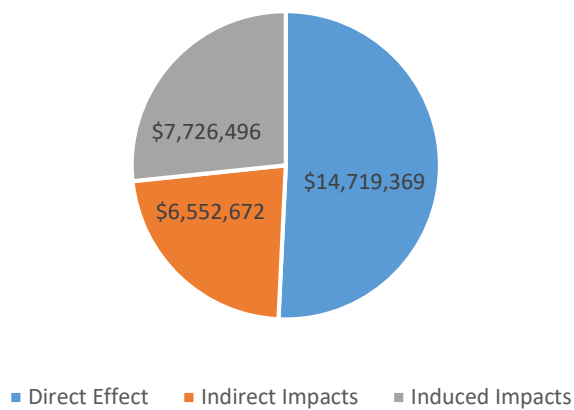
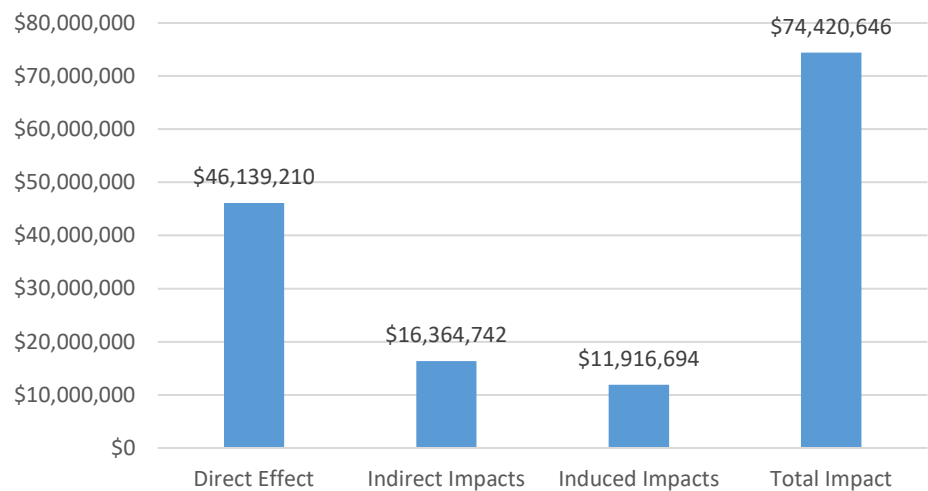


Figure 15: Output Impact - ETC Tenants - Baltimore City



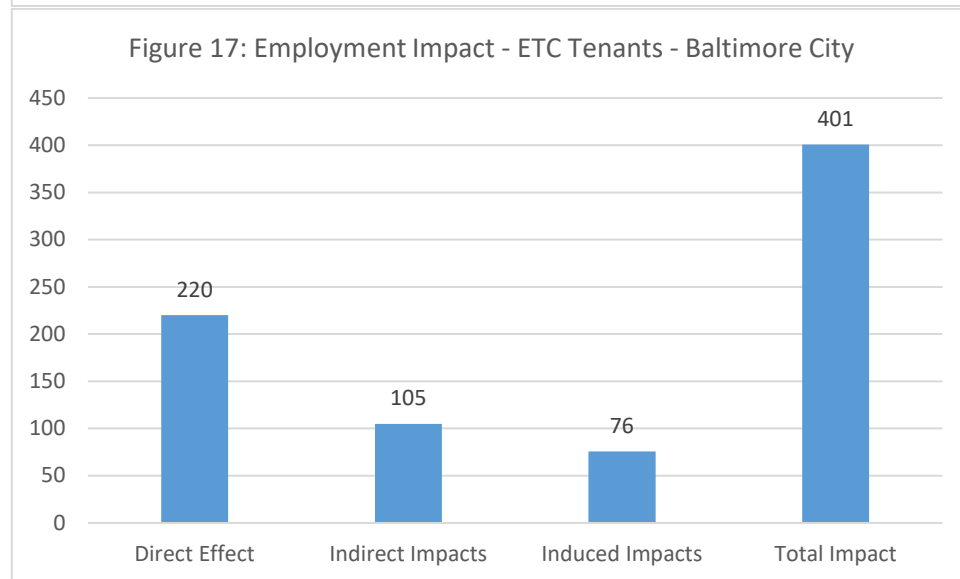
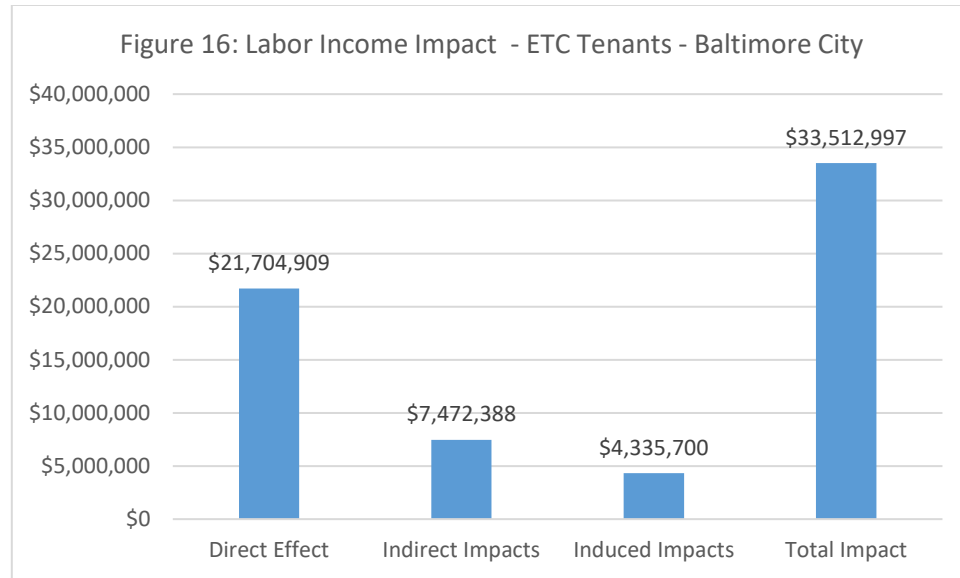


Figure 18: State and Local Gov't Revenue Impact - ETC  
Tenants - Baltimore City

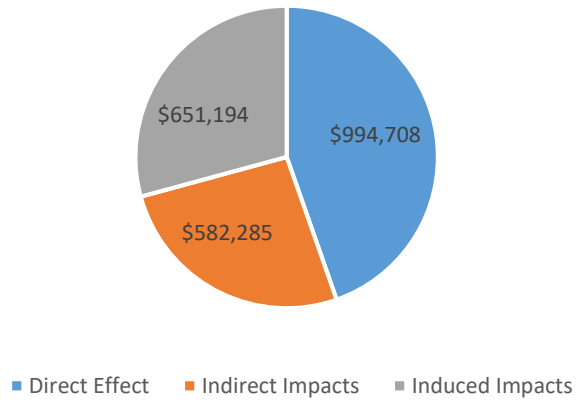
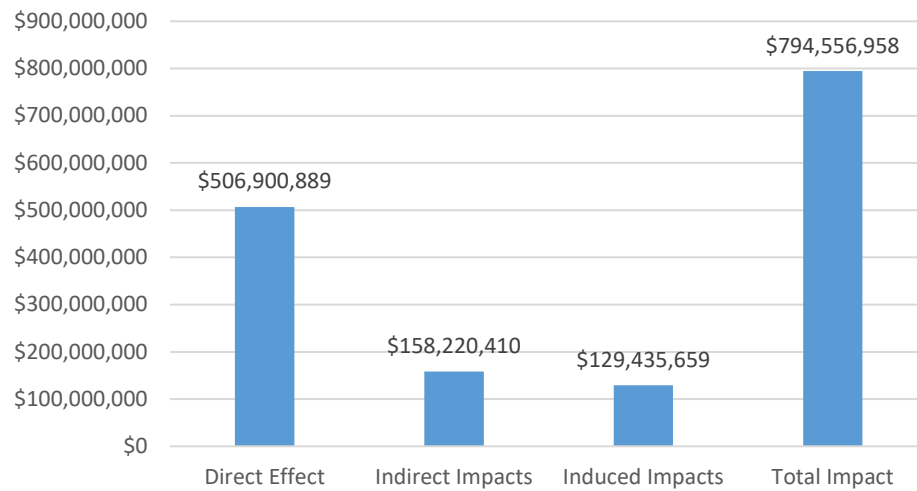
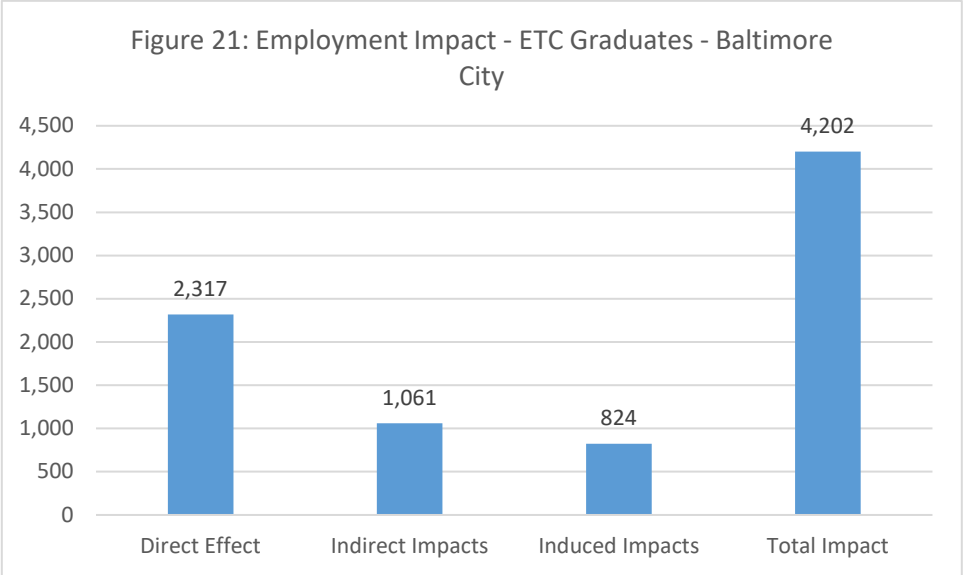
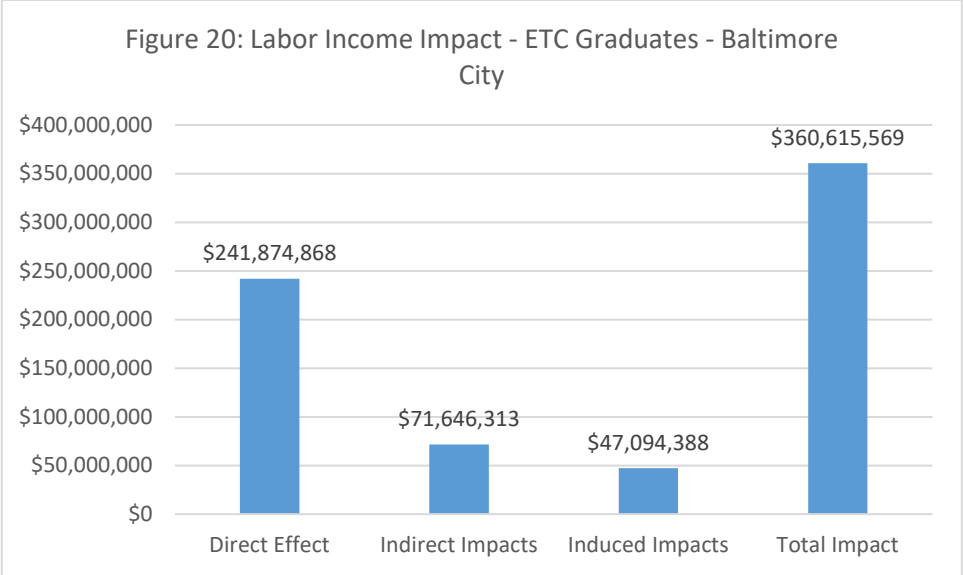
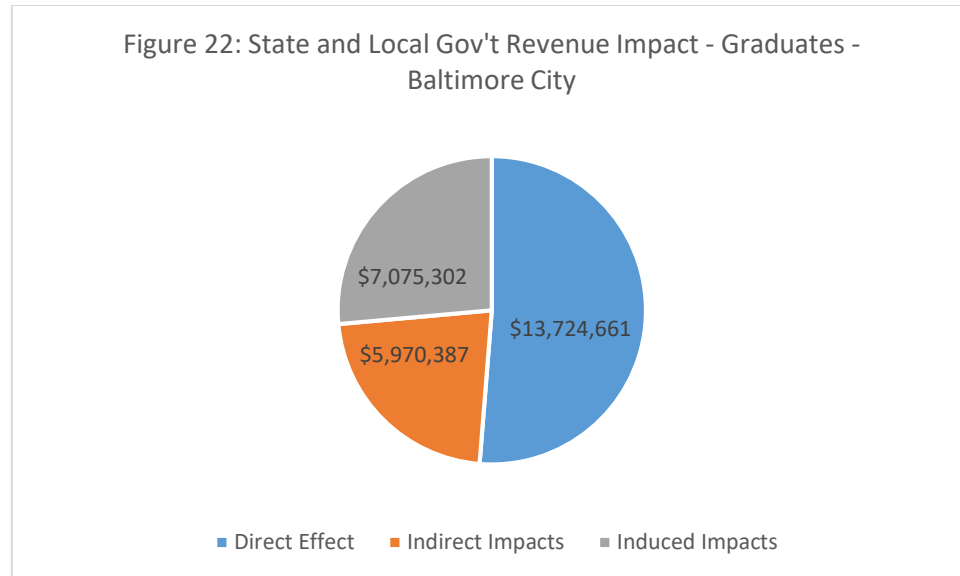


Figure 19: Output Impact - ETC Graduates - Baltimore City









***The economic activity supported by ETC tenant and graduate companies is important to the City of Baltimore.*** The 4,603 jobs directly and indirectly supported by ETC tenant and graduate companies account for almost 1% of all jobs in the City and have average employee compensation of \$74,350, higher than the City average of \$68,000.<sup>4</sup> The JFI estimated the total City government revenues associated with the operations of ETC's tenant and graduate companies operating in the City based on U.S. Bureau of the Census data on Maryland government revenues and estimates that \$13.8 million of the \$29.0 million in combined State and local government revenues accrues to the City.<sup>5</sup> ETC companies are also a vital part of the City and region's innovation-based industry cluster and have raised over \$2.2 billion in funding and investment to grow their operations.

***The economic activity supported by ETC tenant and graduate companies is concentrated in key industry sectors.*** While the jobs directly created or supported by ETC tenant and graduate companies are distributed across the City economy, more than half of the jobs are in the City's important Professional Scientific and Technical Services sector. This is illustrated in the following Table and Figures

<sup>4</sup> The Employee Compensation figures used in this analysis is different than the total labor income data presented in Table 2.

<sup>5</sup> The IMPLAN model used estimates of total **combined** state and local revenues from a variety of major revenue sources, including income, property and sales taxes and other revenues. The JFI distributed these IMPLAN estimated combined state and local revenues into their separate state and local revenue component estimates based on the distribution of state versus local revenues derived by each major revenue source from the U.S. Bureau of the Census *2016 State & Local Government Finance Historical Datasets and Tables: 2016 data*.

**Table 1: Emerging Technology Center - Total Tenant and Graduate Impacts on Baltimore City, By Industry**

Description	Output (\$s)	Labor Income (\$s)	Employment
<b>Total</b>	<b><u>\$868,977,604</u></b>	<b><u>\$394,128,566</u></b>	<b><u>4,603</u></b>
Agriculture, Forestry, Fishing and Hunting	\$2,392	\$704	0
Mining, Quarrying, and Oil and Gas Extraction	\$99,554	\$210	2
Utilities	\$28,869,372	\$3,963,167	18
Construction	\$4,909,532	\$1,977,989	28
Manufacturing	\$89,541,077	\$12,892,917	131
Wholesale Trade	\$7,569,685	\$2,712,805	31
Retail Trade	\$9,941,216	\$3,691,609	119
Transportation & Warehousing	\$8,379,593	\$3,707,209	63
Information	\$55,448,734	\$19,655,778	154
Finance & Insurance	\$31,933,040	\$13,906,020	89
Real Estate and Rental and Leasing	\$67,324,083	\$3,964,855	143
Professional Scientific & Technical Services	\$436,342,356	\$256,709,092	2,370
Management of Companies	\$6,786,587	\$3,140,640	31
Administrative & Waste Services	\$51,787,485	\$28,507,886	646
Educational Services	\$7,307,141	\$4,756,449	119
Health & Social Services	\$28,662,654	\$16,118,811	253
Arts, Entertainment & Recreation	\$4,729,839	\$2,415,493	37
Accommodation & Food Services	\$12,211,945	\$5,361,595	174
Other Services	\$14,864,948	\$7,991,270	171
Government and Non-NAICS	\$2,266,371	\$2,654,067	24

Source: JFI and IMPLAN

Figure 23: Pareto Distribution ETC Tenant and Graduate Total Economic Output Impact on the City of Baltimore By Industry

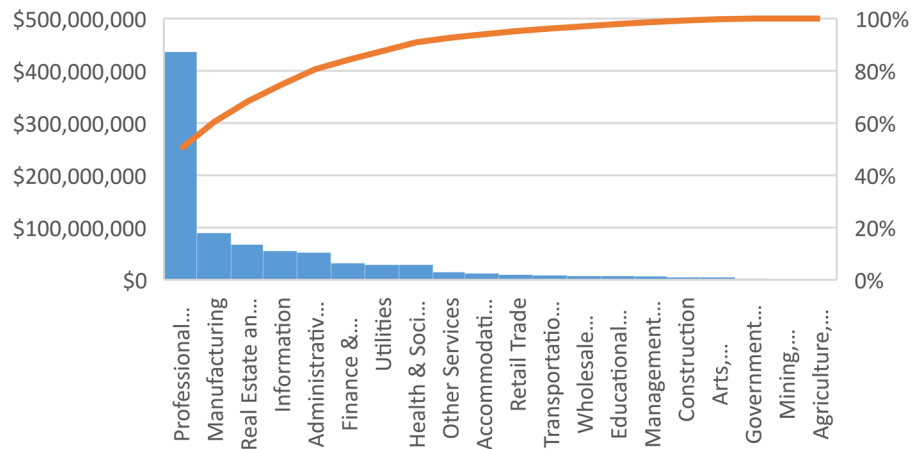
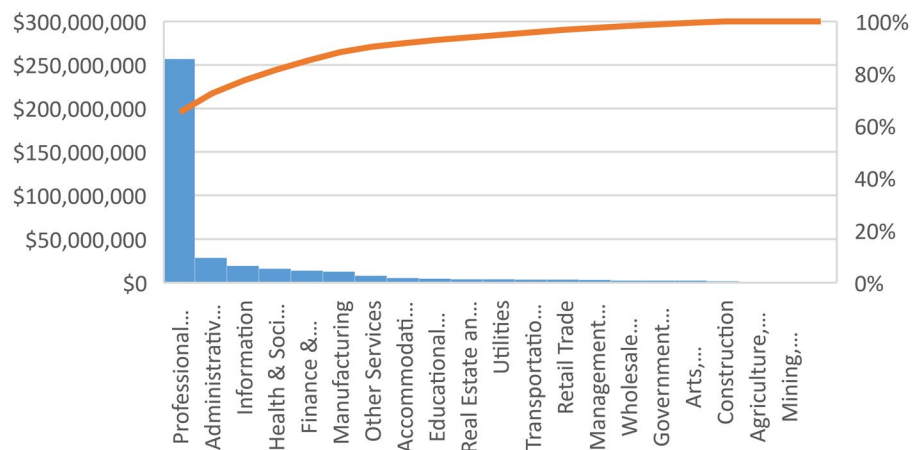
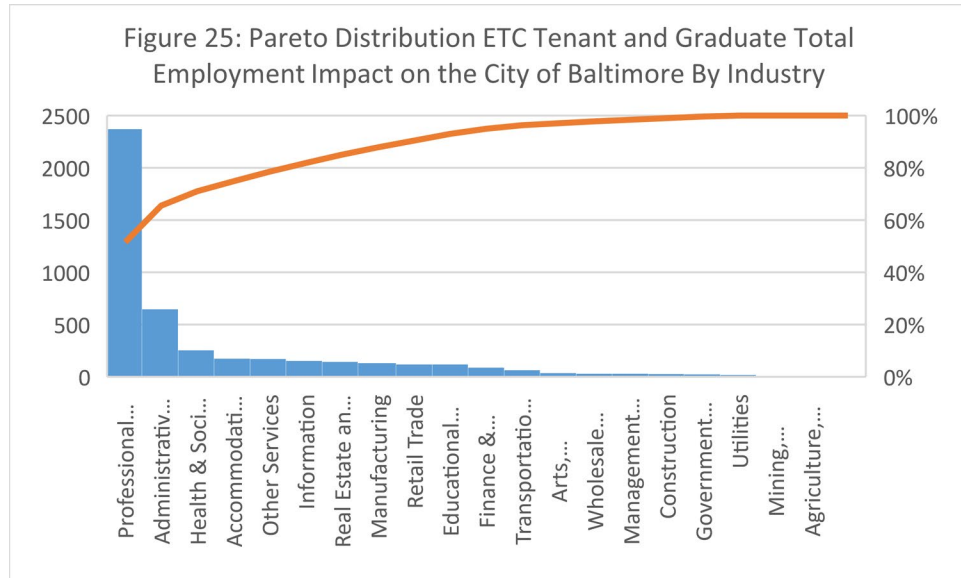


Figure 24: Pareto Distribution ETC Tenant and Graduate Total Labor Income Impact on the City of Baltimore By Industry





## Economic and Fiscal Contribution of the Emerging Technology Center's Tenants and Graduates to the Maryland Economy

The JFI analyzed the economic and fiscal contribution of the 376 ETC tenant and graduate companies currently operating in Maryland. These companies make the following contributions to the Maryland economy (See Appendix Table 3 for the full results):

- In total, the 376 ETC tenant and graduate companies located in Maryland support an estimated \$1.3 billion in Maryland economic activity, consisting of \$727.9 million in direct revenues, \$251.9 million in *Indirect Impacts*, from the purchase of goods and services from Maryland suppliers to support their operations, and \$358.0 million in *Indirect Impacts*, from the salaries and wages paid to their and supplier employees. This business activity supports 7,212 jobs in Maryland, earning \$571.9 million in labor income and supports \$58.0 million in combined State and local government revenues (Figures 26-29);
- The 48 ETC tenant companies located in Maryland have total estimated revenues of \$46.1 million and employ 220 workers. This business activity generates \$87.8 million in Maryland economic activity, supports 489 jobs in the State, earning \$37.5 million in labor income and supports \$3.7 million in combined State and local government revenues (Figures 30-33); and
- The 328 ETC graduate companies located in Maryland have total estimated revenues of \$681.8 million and employ 3,031 workers. This business activity generates \$1.2 billion in Maryland economic activity, supports 6,723 jobs in the City, earning \$534.5 million in labor income and supports \$54.3 million in combined State and local government revenues (Figures 34-37).

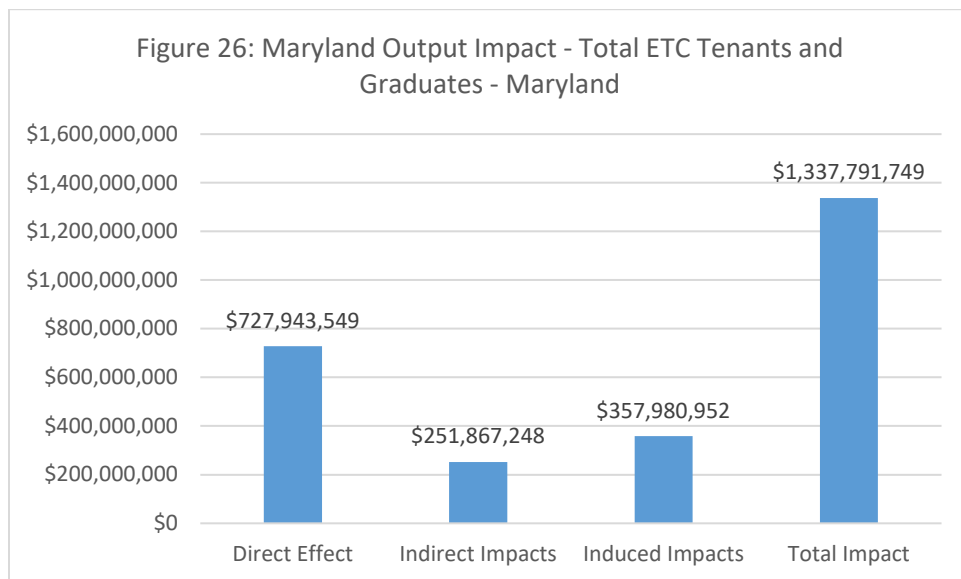


Figure 27: Labor Income Impact - Total ETC Tenants and Graduates - Maryland

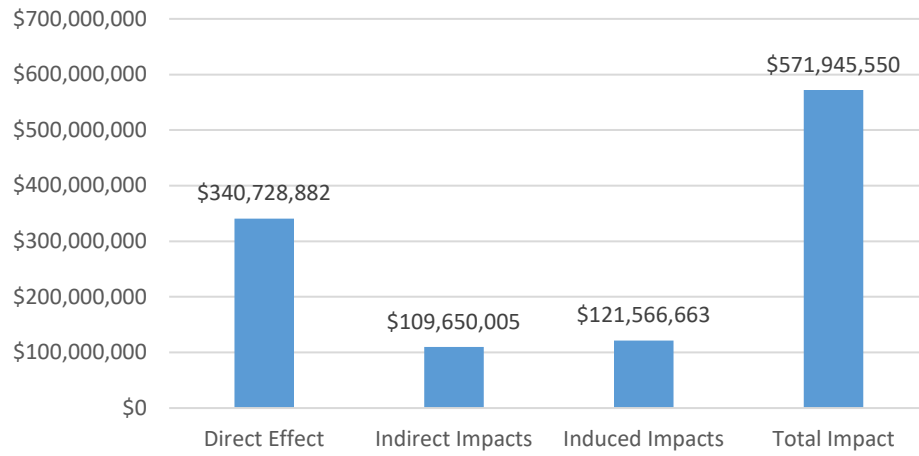


Figure 28: Employment Impact - Total ETC Tenants and Graduates - Maryland

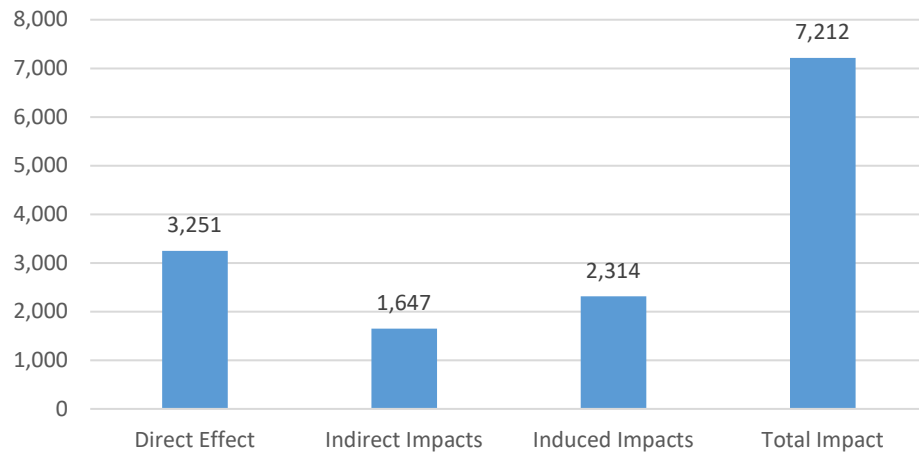


Figure 29: State and Local Gov't Revenue Impact - Total ETC Tenants and Graduates - Maryland

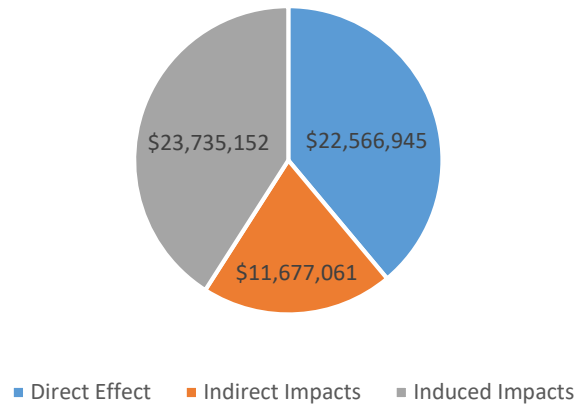
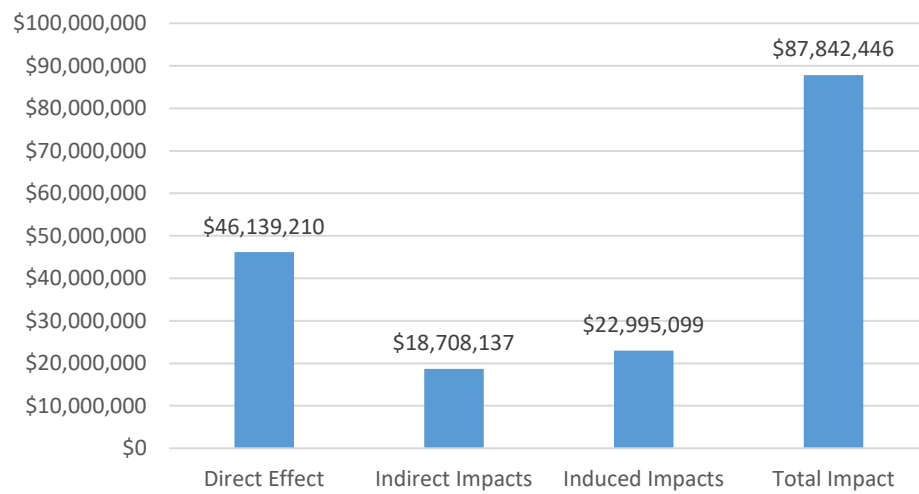


Figure 30: Output Impact - ETC Tenants - Maryland



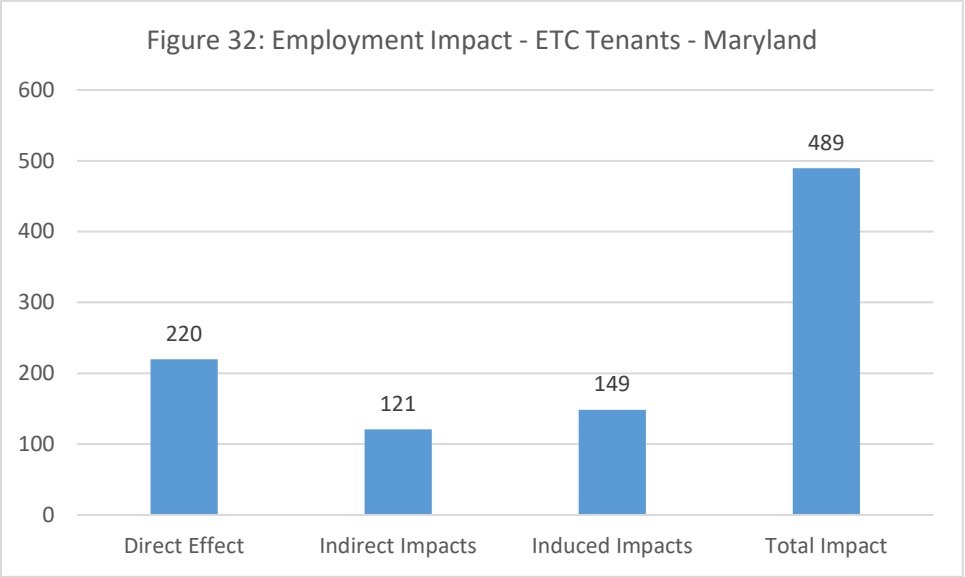
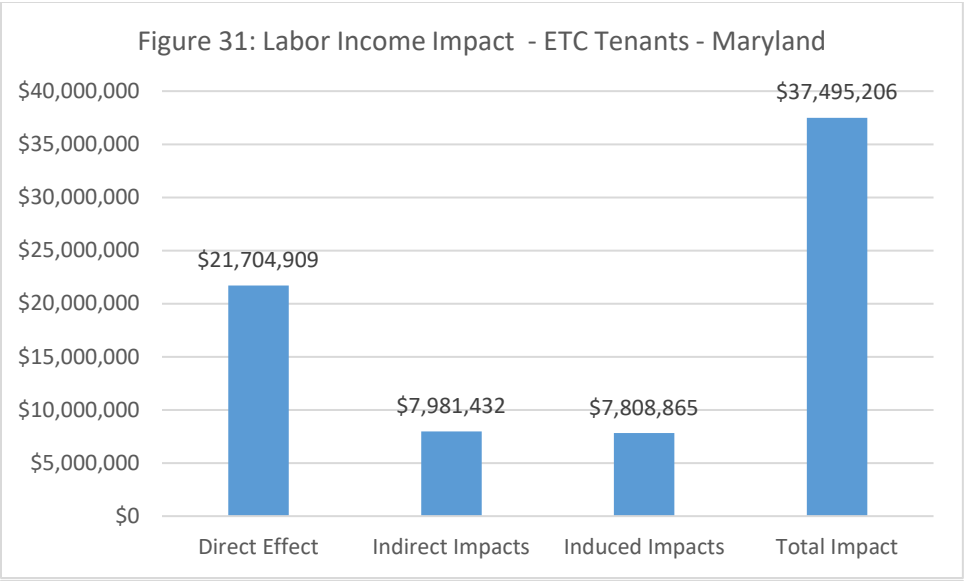
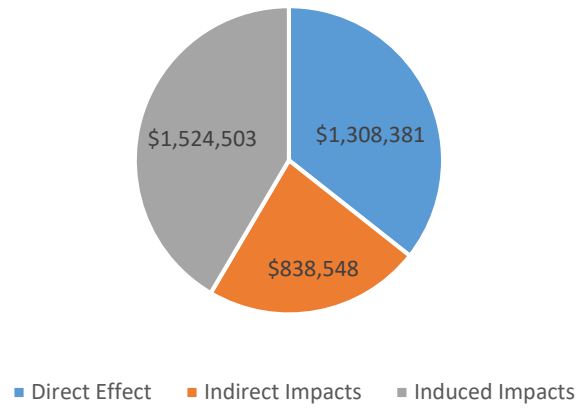
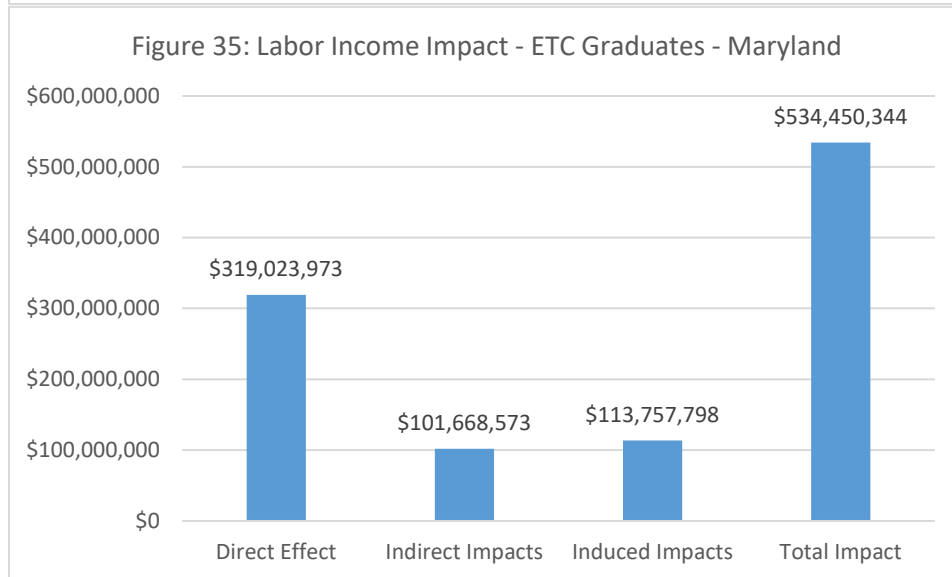
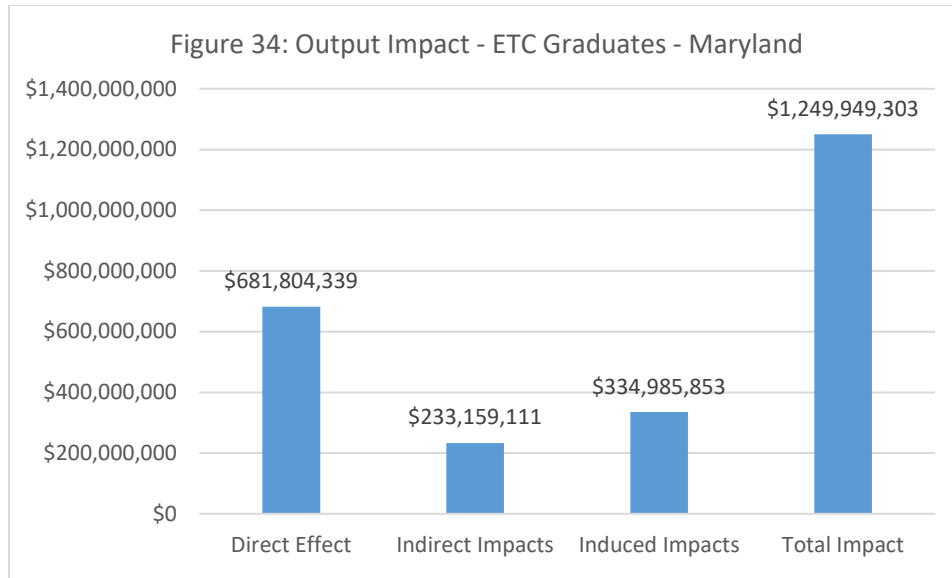
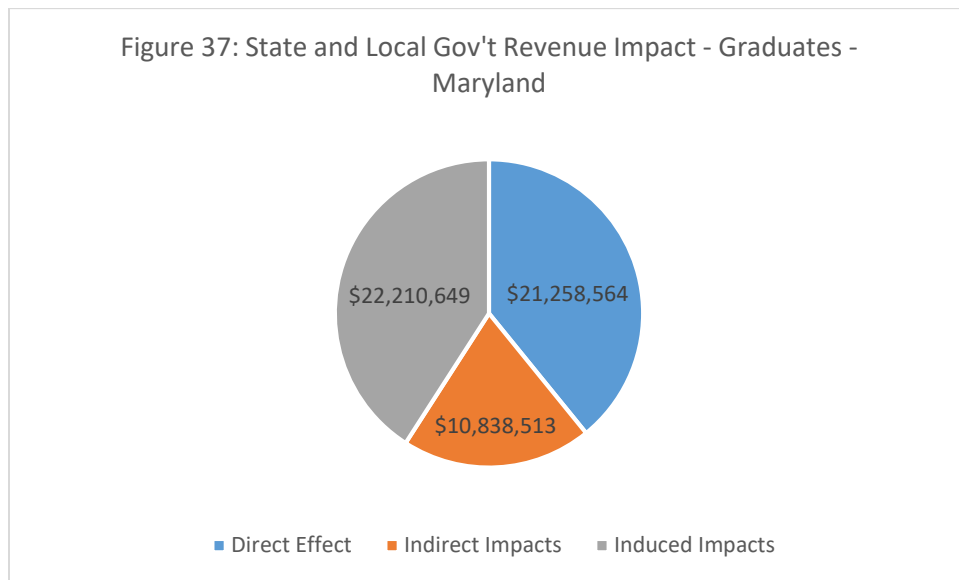
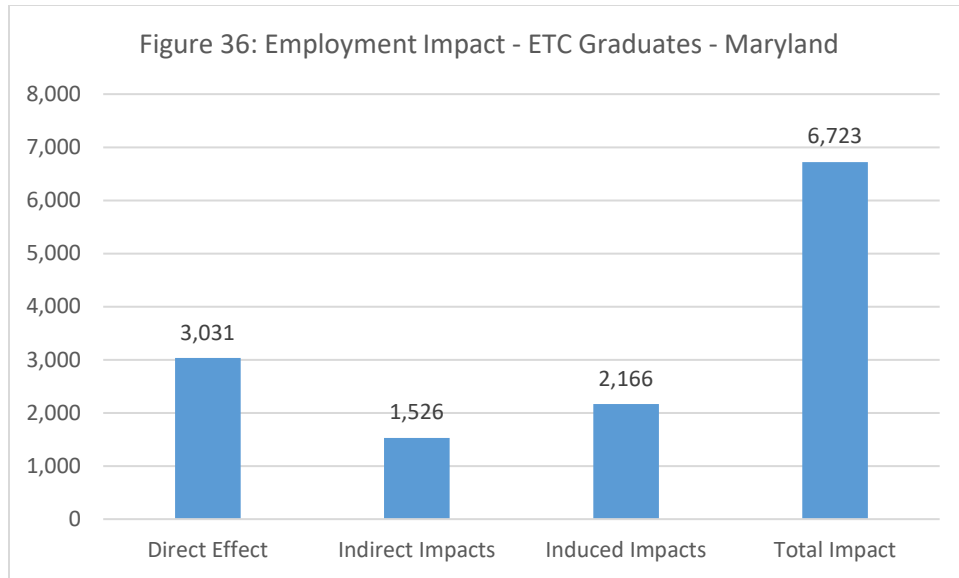




Figure 33: State and Local Gov't Revenue Impact - ETC Tenants  
- Maryland







The jobs created and supported by the ETC Maryland tenant and graduate companies are spread across the Maryland economy, with 44% in the Professional Scientific and Technical Services sector, 10% in the Administrative and Waste Services sector, and 7% in the Health and Social Services sector. This is illustrated in the following Table and Figures:

**Table 3: Emerging Technology Center - Total Tenant and Graduate Impacts on Maryland, By Industry**

Description	Output (\$s)	Labor Income (\$s)	Employment
<b>Total</b>	<b><u>\$1,337,791,749</u></b>	<b><u>\$571,945,550</u></b>	<b><u>7,212</u></b>
Agriculture, Forestry, Fishing and Hunting	\$490,414	\$117,494	6
Mining, Quarrying, and Oil and Gas Extraction	\$195,338	\$25,339	1
Utilities	\$27,761,544	\$7,071,763	37
Construction	\$8,998,993	\$3,515,694	52
Manufacturing	\$140,204,067	\$20,678,804	184
Wholesale Trade	\$22,842,141	\$8,266,600	95
Retail Trade	\$34,388,862	\$13,731,646	380
Transportation & Warehousing	\$18,486,739	\$7,097,433	158
Information	\$99,826,563	\$28,563,590	253
Finance & Insurance	\$59,137,475	\$18,812,470	224
Real Estate and Rental and Leasing	\$127,030,779	\$12,514,693	266
Professional Scientific & Technical Services	\$580,816,931	\$333,535,773	3,199
Management of Companies	\$18,658,583	\$9,653,960	74
Administrative & Waste Services	\$64,492,263	\$36,367,505	744
Educational Services	\$11,011,158	\$7,241,135	170
Health & Social Services	\$56,147,561	\$31,665,331	502
Arts, Entertainment & Recreation	\$8,806,325	\$3,413,843	109
Accommodation & Food Services	\$26,213,164	\$10,562,523	390
Other Services	\$26,941,978	\$15,477,424	333
Government and Non-NAICS	\$5,340,871	\$3,632,528	37

Source: JFI and IMPLAN

Figure 38: Pareto Distribution ETC Tenant and Graduates Total Economic Output Impact on the State of Maryland

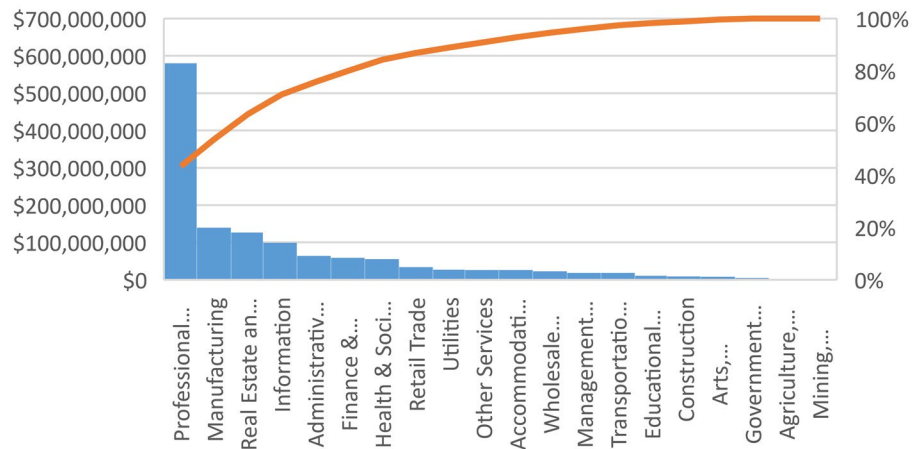


Figure 39: Pareto Distribution ETC Tenant and Graduate Total Labor Income Impact on the State of Maryland

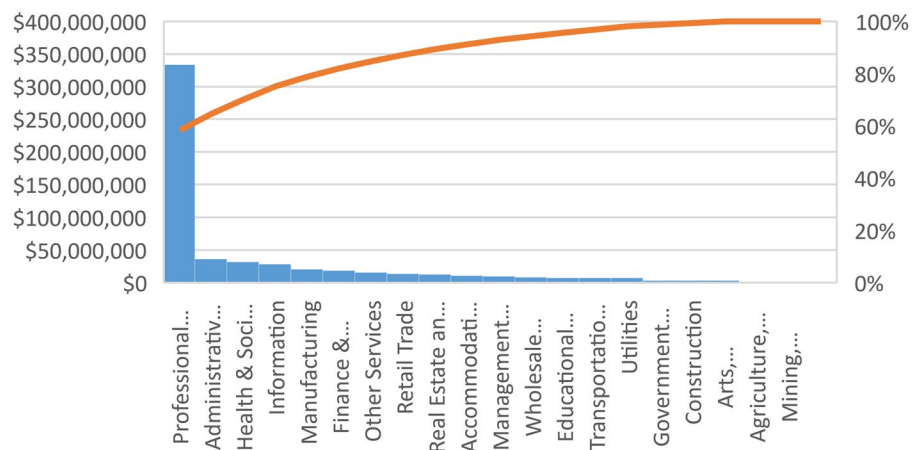
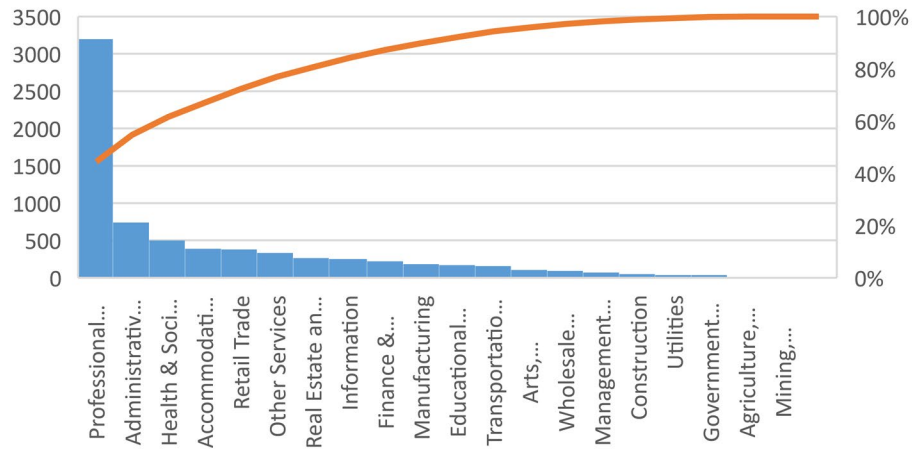


Figure 40: Pareto Distribution ETC Tenant and Graduate Total Employment Impact on the State of Maryland



## APPENDIX TABLES

**Appendix Table 1: ETC Current Tenants and Graduates**

	Current Tenants		ETC Graduates		Total	
	# Firms	Employment	# Firms	Employment	# Firms	Employment
Total Firms	48	220	384	3,499	432	3,719
Maryland Firms	48	220	328	3,031	376	3,251
Baltimore City Firms	48	220	217	2,317	265	2,537
Source: ETC and JFI						

**Appendix Table 2: Emerging Technology Center - Tenant and Graduate Impacts on Baltimore City**

	Output (\$s)	Labor Income (\$s)	Employment	State/Local Tax Revenue (\$s)
<u>Total - ETC Tenants and Graduates</u>				
Direct Effect	\$553,040,099	\$263,579,777	2,537	\$14,719,369
Indirect Impacts	\$174,585,152	\$79,118,701	1,166	\$6,552,672
Induced Impacts	\$141,352,353	\$51,430,088	900	\$7,726,496
<b>Total Impact</b>	<b>\$868,977,604</b>	<b>\$394,128,566</b>	<b>4,603</b>	<b>\$28,998,537</b>
<u>ETC Tenants</u>				
Direct Effect	\$46,139,210	\$21,704,909	220	\$994,708
Indirect Impacts	\$16,364,742	\$7,472,388	105	\$582,285
Induced Impacts	\$11,916,694	\$4,335,700	76	\$651,194
<b>Total Impact</b>	<b>\$74,420,646</b>	<b>\$33,512,997</b>	<b>401</b>	<b>\$2,228,187</b>
<u>ETC Graduates</u>				
Direct Effect	\$506,900,889	\$241,874,868	2,317	\$13,724,661
Indirect Impacts	\$158,220,410	\$71,646,313	1,061	\$5,970,387
Induced Impacts	\$129,435,659	\$47,094,388	824	\$7,075,302
<b>Total Impact</b>	<b>\$794,556,958</b>	<b>\$360,615,569</b>	<b>4,202</b>	<b>\$26,770,350</b>
Source: JFI and IMPLAN				

**Appendix Table 3: Emerging Technology Center - Tenant and Graduate Impacts on Maryland**

	Output (\$s)	Labor Income (\$s)	Employment	State/Local Tax Revenue (\$s)
<b>Total - ETC Tenants and Graduates</b>				
Direct Effect	\$727,943,549	\$340,728,882	3,251	\$22,566,945
Indirect Impacts	\$251,867,248	\$109,650,005	1,647	\$11,677,061
Induced Impacts	\$357,980,952	\$121,566,663	2,314	\$23,735,152
<b>Total Impact</b>	<b>\$1,337,791,749</b>	<b>\$571,945,550</b>	<b>7,212</b>	<b>\$57,979,158</b>
<b>ETC Tenants</b>				
Direct Effect	\$46,139,210	\$21,704,909	220	\$1,308,381
Indirect Impacts	\$18,708,137	\$7,981,432	121	\$838,548
Induced Impacts	\$22,995,099	\$7,808,865	149	\$1,524,503
<b>Total Impact</b>	<b>\$87,842,446</b>	<b>\$37,495,206</b>	<b>489</b>	<b>\$3,671,432</b>
<b>ETC Graduates</b>				
Direct Effect	\$681,804,339	\$319,023,973	3,031	\$21,258,564
Indirect Impacts	\$233,159,111	\$101,668,573	1,526	\$10,838,513
Induced Impacts	\$334,985,853	\$113,757,798	2,166	\$22,210,649
<b>Total Impact</b>	<b>\$1,249,949,303</b>	<b>\$534,450,344</b>	<b>6,723</b>	<b>\$54,307,726</b>
Source: JFI and IMPLAN				