



# Regional Economic Impact Study

of the UCF's Business Incubation Program

July 2014 to June 2016



Prepared for



**A Review of the University of Central Florida Business  
Incubation Program Economic Impacts from  
July 01, 2014 through June 30, 2016**

To

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Review & Foreword

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## FOREWORD

This updated analysis for 2014-16 prepared by Dr. Vernet Lasrado is a thorough and credible report regarding the continuing growth and effectiveness of the UCF Business Incubation Program more than fifteen years after its inception. Dr. Lasrado has once again updated his economic analysis using IMPLAN v3 – a highly regarded and oft-used input-output model that allows for impact analysis at a local and regional level, using primary data collected locally, as well as national trends within specific industry groups.

Dr. Lasrado has been careful to make conservative yet accurate comparisons between the current impact findings and estimates that were provided as the products of earlier analyses in 2009, 2011, 2013 and 2014. Where many like studies rely on averages or national data, I applaud his efforts to secure and validate local, “real-world” data and the straightforward presentation of the data incorporated, the methodology employed, and the summary findings of his analysis.

There is no denying the remarkable success of the UCF Business Incubation Program (UCFBIP) – not only as a very productive creator of new jobs in high technology and other quality industries, but also as a model for focused and cost-effective economic development. Not only is UCFBIP a model for cooperative partnerships between the higher education system, local government, private enterprise, and a myriad of support agencies, it accomplishes its mission by leveraging local public investment at a rate of \$7.41 returned in local taxes for every \$1.00 invested. That leverage continues to increase as the system matures and produces more graduated firms in high technology industry sectors.

When the total public investment over two years beginning in July 2014 – (\$4.9 million; see table 2-3) is compared to the level of tax revenues returned to state and local governments in the same two-year period (\$36.3 million; see table 3-4) – it can be seen that the system-wide return on public investment is about 740%. Not many public (or private) investment initiatives can even dream of such cost-effectiveness. Dr. Lasrado also points out in Section 3 that each \$1.00 of public investment also produces \$71 of additional regional GDP (value added) and \$141 of regional sales (output). The total economic output of the firms sustained by the UCFBIP is now exceeding \$1.3 Billion in Central Florida. This is admirable success in the field of economic development.

There is also no denying that UCFBIP continues to be a job-creating “machine” of a high order. Based on the ongoing research by Dr. Lasrado, by the summer of 2016, UCFBIP has directly or indirectly produced and sustained more than 4,700 full-time, permanent, high quality jobs within the central Florida regional economy.

This current update once again clearly demonstrates that through good management; careful client selection and training; focused education of clients; and on-going follow-up support, the

UCFBIP has managed to sustain a viable network of facilities while maintaining its high standards of accountability and success. With a mature network of seven incubators now operating within five Central Florida counties, the UCFBIP has built a foundation of success for local economic development efforts and has provided a platform for aspiring entrepreneurs to conceive, develop, nurture, and grow their business dreams.

## EXECUTIVE SUMMARY

Since its formation in 1999, the University of Central Florida Business Incubation Program (UCFBIP) has provided almost 400 early stage companies with the enabling tools, training and infrastructure to create financially stable high growth/impact enterprises. With multiple locations across Central Florida, the UCFBIP is supported by a number of partners including city and county governments and the Florida High Tech Corridor Council. These partners commissioned the previous studies of the UCFBIP's economic impact in 2009, 2011, 2013, and 2014. ***This study quantifies the impact of the client firms<sup>1</sup> of the UCF Business Incubation program across all its locations from July 01, 2014 through June 30, 2016.***

This study reveals that the operations of the firms participating in the UCFBIP program:

1. Sustained a total<sup>2</sup> of 4,710 jobs<sup>3</sup> at the end of study period
  - a. Directly<sup>4</sup> sustained 2,364 Jobs in the region at the end of study period, and
  - b. Indirectly<sup>5</sup> sustained an additional 975 jobs throughout the region;
2. Had a total impact on regional GDP of over \$725 million<sup>6</sup>,
  - a. Direct regional GDP of over \$352 million, and
    - i. For fiscal years 2014-2016, every \$1 of public investment directly<sup>7</sup> resulted in an estimated \$71 in regional GDP
  - b. Indirectly impacted of over \$156 million of additional regional GDP
3. Had a total impact on regional sales of over \$1.3 billion,
  - a. Direct regional sales of over \$694 million, and
    - i. For fiscal years 2014-2016, every \$1 of public investment directly<sup>8</sup> resulted in an estimated \$141 in regional sales
  - b. Indirectly impacted over \$264 million of additional regional sales
4. Had a total impact on State and Local taxes of over \$36.29 million
  - a. For fiscal years 2014-2016, every \$1 of public investment resulted in an estimated \$7.41 is returned in taxes

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<sup>1</sup> Current Clients, Exited Clients, and Graduated Clients as of June 30, 2016

<sup>2</sup> In economic impact lingo, we are referring to the Total Effect

<sup>3</sup> Based on a snapshot of jobs as of June 30, 2016

<sup>4</sup> In economic impact lingo, we are referring to the Direct Effect

<sup>5</sup> In economic impact lingo, we are referring to the Indirect Effect

<sup>6</sup> All reported dollar amount have been adjusted to 2017 dollars

<sup>7</sup> Calculated by dividing Direct Regional GDP by Total Adjusted Funding

<sup>8</sup> Calculated by dividing Direct Regional Sales by Total Adjusted Funding

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# 1 INTRODUCTION

The goal of the UCF Business Incubation Program (UCFBIP) and its community partners is to facilitate smarter, faster startup and growth of emerging companies so those companies will become financially successful, high growth companies in the community. The mission is to have a University-driven community partnership providing early stage companies with the enabling tools, training and infrastructure to create financially stable high growth/impact enterprises.

Since its inception, UCFBIP clients have been provided an array of business development services and resources to help accelerate growth. The formal incubation process takes place through a series of strategic and tactical working sessions. The strategic sessions are designed to help define the company business, market and capital strategies and to build the business plan. Expertise and resources are identified for the company to utilize in addressing tactical needs as they are identified through the strategy sessions or through other informal interactions with Incubator staff and advisors. Regular education and networking programs also are designed to address the shared needs identified among UCFBIP clients. Graduation takes place when a client has achieved a level of financial and corporate growth that enables them to leave the incubator and enter the second stage of corporate growth.

With multiple locations across Central Florida, the UCFBIP is supported by a number of partners including city and county governments and the Florida High Tech Corridor Council, which commissioned the previous studies of the UCFBIP's economic impact in 2009, 2011, 2013, and 2014.

W. H. Owen while employed at Real Estate Research Consultants, Inc. (RERC) first performed the review of the economic impact of the UCFBIP on the surrounding counties in 2009. In 2011, a subsequent review was performed again by W. H. Owen with W. H. Owen Consulting, Inc. (WHO), retained by the Florida High Tech Corridor Council (FHTCC) to prepare an economic impact analysis of the UCFBIP. The latter study accounted for the impact of the UCFBIP up to October 2011. In 2013, a study was conducted to account for the impact of the UCFBIP from October 2011 through June 30, 2013. The study in 2014 quantified the cumulative impact of the UCFBIP since its inception in 1999 over a 15 year period from July 1, 1999 through June 30, 2014. These impact analyses measured the spending patterns and tax impacts of past UCFBIP clients.

The current study quantifies the cumulative impact of the UCFBIP from July 1, 2014 through June 30, 2016. It does so by aggregating the modelled economic impact of the activities of the firms that have participated (current and graduated) in the UCFBIP for each fiscal year.



## 1.1 Review of the state of the UCFBIP for the study period

Table 1-1 below indicates the Incubators and their status for the duration of the study period and current status. It should be noted that for the purposes of this study, current client firms are included only for the years each incubator is active. Once an incubator is not an active participant of the UCFBIP network, its current client firms are excluded from the study unless they transferred to an active incubator in the UCFBIP network. While eleven incubators contributed to the impacts documented in past studies only seven incubators are currently<sup>9</sup> operated as the UCFBIP network.

Table 1-1: UCFBIP Incubator sites history and status

Incubator	Open Year	Status
Central Florida Research Park	1999	Active
Downtown	2004	Merged in 2009 with Orlando Incubator
Photonics UCF Campus	2007	Active
Orlando	2007	Active
Winter Springs	2008	Active
Leesburg	2009	Turned site over to city in December, 2012
Sanford	2009	Closed Site in 2012
St. Cloud	2010	Closed Site in 2015
Kissimmee	2010	Active
Daytona	2011	Active
Apopka	2012	Active

The remainder of the report will discuss the methodology used and present the outcomes of the current study.

## 2 METHODOLOGY

In essence, this study models the economic impact of the activities of the firms that have participated in the UCFBIP for each year since July 1, 2014 through June 30, 2016. These economic impacts are reported in the form of direct impact, indirect impact, and induced impact. The following section will detail the constraints of the study, the assumptions made, data collection endeavor, a summary of the collected/reported data, and the analysis technique.

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<sup>9</sup> As of June 30, 2016

## **2.1 Constraints of the study**

### **2.1.1 Type of Firms modelled**

In general, UCFBIP client firms fall into two categories: current firms and graduated firms. For a given fiscal year, current firms are those actively participating in the UCFBIP. Likewise, graduated firms are those that have successfully completed the UCFBIP curriculum in a prior fiscal year. There is also the case when some current firms exit the program prior to graduation. In this event, these firms are excluded from the study from that fiscal year onwards. Another point to note is that at any point of time, firms that leave the study area are excluded from the study post their departure year.

### **2.1.2 Study Period**

The current study encompasses the period from July 1, 2014 through June 30, 2016.

### **2.1.3 Study Area**

The individual incubators in the UCFBIP are located in various cities, counties, and MSA's across Central Florida. As described by Table 2-1, the five incubator counties fall under two MSA's (Orlando-Kissimmee-Sanford and Deltona-Daytona Beach-Ormond Beach) henceforth referred to as the *study area*.

### **2.1.4 Software Used**

As in the most recent study, the current study uses IMPLAN version 3. The use of IMPLAN reflects the general trend towards its application by multiple departments within the UCF Office of Research and Commercialization thereby leading to a more standardized output across the reports generated.

## **2.2 Assumptions**

### **2.2.1 Use of MSAs**

This study builds upon the use of Metropolitan Statistical Areas (MSAs) as the basis unit of measurement of the study area. Using just the county information assumes that all of the client employees and business takes place within the county. In reality, many of the client employees and business takes place across county boundaries and this is effectively captured by using MSAs as the basis of the study area. Each MSA area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core<sup>10</sup>.  
Table 2-1: UCFBIP Incubator sites, county and MSA information

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<sup>10</sup> US Census Bureau website <http://www.census.gov/population/metro/>

Incubator	City	County	MSA
Apopka	Apopka	Orange	Orlando-Kissimmee-Sanford, FL
Central Florida Research Park	Orlando	Orange	Orlando-Kissimmee-Sanford, FL
Daytona	Daytona	Volusia	Deltona-Daytona Beach-Ormond Beach, FL
Orlando	Orlando	Orange	Orlando-Kissimmee-Sanford, FL
Kissimmee	Kissimmee	Osceola	Orlando-Kissimmee-Sanford, FL
Photonics	Orlando	Orange	Orlando-Kissimmee-Sanford, FL
Winter Springs	Winter Springs	Seminole	Orlando-Kissimmee-Sanford, FL

### 2.2.2 Use of 2017 Dollars for analysis

All the analysis performed reports any dollar amounts in 2017 dollars. This can be performed by using the Consumer Price Index (CPI)<sup>11</sup> as a measure to indicate the amount of inflation or deflation. As it can be seen in Table 2-2, the CPI multiplier column is the amount of inflation required to equate the corresponding year's dollar amount to 2017. This is derived by dividing the 2017 CPI value by the corresponding years CPI value. If the number is greater than 1 there is inflation, otherwise there is deflation. By way of illustration, \$100.00 in 2014 would equate to approximately \$102.90<sup>12</sup> in 2017 dollars. It is important that the funding is reported for the fiscal year (FY), i.e., July 1 (Current Year) though June 30 (Next Year). Hence, the CPI multipliers for each of the two years in a given fiscal year are blended to adjust the annual fiscal dollar amounts to 2017 dollar amounts.

Table 2-2: Inflation Adjustment Multipliers

Year	CPI Multiplier
2014	1.0290
2015	1.0278
2016	1.0150
2017	1.0000

Table 2-3: UCFBIP summary of public funding adjusted to 2017 dollars

Fiscal Years	Actual Funding	Adjusted Funding
2014-2015	\$2,390,671	\$2,462,391
2015-2016	\$2,390,671	\$2,438,484
Total	\$4,781,342	\$4,900,875

<sup>11</sup> Retrieved from [https://www.bls.gov/data/inflation\\_calculator.htm](https://www.bls.gov/data/inflation_calculator.htm)

<sup>12</sup> \$100.00 x 2014 Multiplier = \$100.00 x 1.0290= \$102.90

## 2.3 Data collection and assimilation

The site managers performed the arduous task of collecting/retrieving information on current and graduated client firms for all the fiscal years. The data collection endeavor was a great success in providing accurate and complete data for the analysis to be performed. *If available*, for each firm for each fiscal year the data collected included information on:

- Industry Classification
- Number of employees
- Sales
- Grants received
- investment received
- Year joined the UCFBIP
- Year graduated from the UCFBIP
- Employer Identification Number (EIN)
- DUNS Number

For the current or graduated firms for which no information was reported the EIN and DUNS numbers were used to search the ES202 and LEXISNEXIS databases for further information on the employment and sales of these firms. It should be noted that for most of the newer UCFBIP client firms, the site managers had reported most of the information as described above. However, for the older UCFBIP firms the information reported was sparse and generally included information only on employment as the firms were not obligated to respond to data collection efforts by the site managers. This is not an issue as the analysis software (to be discussed) IMPLAN v3 can accept either earnings or employment counts as inputs to determine the economic impact.

Summary results as reported by the site managers present snapshots of the jobs sustained by the current and graduated firms in the program for the given years. The summary of the jobs sustained by UCFBIP current and graduated firms since inception is presented in Figure 2-1.

Table 2-4: Reported jobs sustained as a result of UCFBIP clients from 2000 through 2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Current	12	31	49	105	102	117	193	265	129
Graduated	2	10	32	72	180	234	291	437	537
Total	14	41	81	177	282	351	484	702	666

Table 2-5: Reported jobs sustained as a result of UCFBIP clients from 2009 through 2016

	2009	2010	2011	2012	2013	2014	2015	2016
Current	187	314	518	744	728	884	777	942
Graduated	668	873	1,019	1,145	1,341	1,334	1,431	1,690
Total	855	1,187	1,537	1,889	2,069	2,218	2,208	2,632

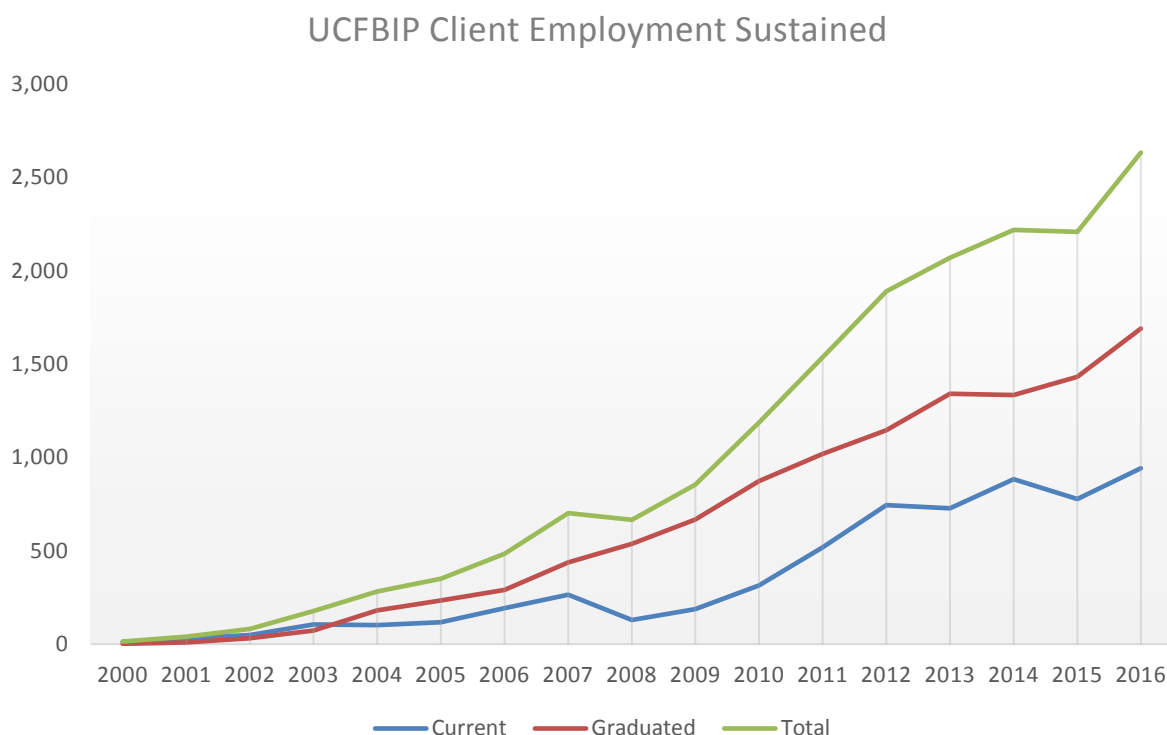


Figure 2-1: Summary of UCFBIP employment sustained since inception

## 2.4 Analysis

For an in-depth explanation of IMPLAN, please refer to the appendix on IMPLAN presented on page 12. The study was performed using IMPLAN Version 3. This software enables the user to define the study area (that may contain multiple counties). As discussed earlier, multiple counties have been grouped into MSAs. These MSAs in turn when grouped form the base unit of the study area. Furthermore, in order to accurately capture the impacts that occur in a particular study area, only expenditures resulting from the amount of demand or sales occurring locally should be considered in the study. This study leverages IMPLAN's ability to isolate the impacts that occur only as a result of local expenditures, thereby providing a conservative estimate for the impact of the UCFBIP on the study area.

From the data collected and reported by the site managers, information was extracted for the current and graduated firms for each year of operation of the UCFBIP. This information was then complied and formatted so as to be entered into IMPLAN. Then, an impact scenario was created for each fiscal year for each MSA for 2014/15 and 2015/16 to model the impact of the operations of the firms associated with the UCFBIP on the study area. As a result, multiple scenarios were analyzed and aggregated together to form the outcomes that represent the economic impact of these firms for the study period across the study area. IMPLAN v3 gives reliable estimates of jobs sustained, regional sales, total economic output generated, state and local taxes generated, and federal taxes generated.

### 3 RESULTS

#### 3.1 Summary results as estimated by IMPLAN v3

##### 3.1.1 Jobs Sustained

As indicated by Table 3-1, it is estimated that the activities of the UCFBIP current and past graduated firms have sustained 4,710 jobs in the study area at the end of study period of which 2,364 Jobs<sup>13</sup> were directly sustained by UCFBIP current and graduated firms.

Table 3-1: Estimate of Full-Time Jobs Sustained as a result of all<sup>14</sup> local UCFBIP clients

Fiscal Years	Direct Effect	Indirect Effect	Induced Effect	Total Effect
2014-2015	2,223	960	1,281	4,464
2015-2016	2,364	975	1,371	4,710

##### 3.1.2 Regional GDP Impact

At indicated by Table 3-2, it is estimated that for the study period, the activities of the UCFBIP current and past graduated firms had a total impact of over \$725 million<sup>15</sup> in regional GDP<sup>16</sup> in the study area. Of this, over \$352 million in regional GDP can be directly attributed to the activities of the UCFBIP current and past graduated firms.

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<sup>13</sup> This computed number for total direct job is approximately 10% lower than the figures in Table 2-5 as IMPLAN accounts for seasonal employees by Industry by area

<sup>14</sup> Current and Graduated clients

<sup>15</sup> Reported in 2017 dollars

<sup>16</sup> Regional GDP is defined as the Gross Domestic Product generated in the study area (Orlando & Daytona MSA's) as a result of the activities of the UCF BIP Clients



Further, for the study period, it should be noted that every \$1 of public investment directly resulted<sup>17</sup> in an estimated \$71 in regional GDP.

Table 3-2: Regional GDP impacted by activities of all local UCFBIP clients

Fiscal Years	Direct Effect	Indirect Effect	Induced Effect	Total Effect
2014-2015	\$170,418,384	\$78,781,592	\$104,506,487	\$353,706,463
2015-2016	\$181,603,315	\$78,118,973	\$111,913,844	\$371,636,132
Total	\$352,021,699	\$156,900,565	\$216,420,331	<b>\$725,342,595</b>

### 3.1.3 Regional Sales Impact

As indicated by Table 3-3, it is estimated that for the study period, the activities of the UCFBIP current and past graduated firms had a total impact of over \$1.31 billion in regional sales<sup>18</sup> in the study area. Of this, over \$691 million in regional sales can be directly attributed to the activities of the UCFBIP current and past graduated firms.

Further, for the study period, it should be noted that every \$1 of public investment directly resulted<sup>19</sup> in an estimated \$141 in regional sales.

Table 3-3: Regional sales impacted by activities of all local UCFBIP clients

Fiscal Years	Direct Effect	Indirect Effect	Induced Effect	Total Effect
2014-2015	\$341,471,796	\$132,654,478	\$174,522,141	\$648,648,415
2015-2016	\$350,364,954	\$131,766,453	\$186,892,278	\$669,023,685
Total	\$691,836,750	\$264,420,931	\$361,414,419	<b>\$1,317,672,100</b>

### 3.1.4 State and Local Tax generated

IMPLAN also reports on the State/Local Taxes collected as a result of the modeled scenario. In the *Employee Compensation* field, IMPLAN reports on the amount of the employer collected and paid social security taxes on wages. For, state/local taxes these values are mostly contributions to government retirement funds. Taxes on *Production and Imports* are collected by the businesses on behalf of the State and local governments. These taxes include sales tax, property tax, motor vehicle tax, severance tax, business licenses taxes, and documentary and stamp taxes. Taxes reported under *Households* include personal income tax (none for Florida), personal vehi-

<sup>17</sup> Calculated by dividing Direct Regional GDP by Total Adjusted Funding from Table 2-3

<sup>18</sup> Regional Sales is defined as the sales generated in the study area (Orlando & Daytona MSA's) as a result of the activities of the UCF BIP Clients

<sup>19</sup> Calculated by dividing Direct Regional Sales by Total Adjusted Funding from Table 2-3

cle fee payments, personal property taxes, fines, donations, and licensing fees. Taxes on *Corporations* include corporate tax payments on profits and dividends paid to governments on government investments. As indicated by Table 3-4, the total State and Local taxes generated is over \$36 million<sup>20</sup>.

Table 3-4: Total State and Local Tax generated by activities of all local UCFBIP clients

Fiscal Years	Total State and Local Tax				Total
	Employee Compensation	Production and Imports	Households	Corporations	
2014-2015	\$147,785	\$16,719,267	\$842,513	\$268,395	\$17,977,960
2015-2016	\$158,008	\$16,988,855	\$902,397	\$265,322	\$18,314,582
Total	\$305,793	\$33,708,122	\$1,744,910	\$533,717	<b>\$36,292,542</b>

*Further, for the study period*, it should be noted that every \$1 of public investment resulted<sup>21</sup> in an estimated \$7.41 returned in taxes to state and local governments.

Table 3-5: Taxes per \$1 Invested in the UCFBIP

Fiscal Years	Taxes	Adjusted Investment	Taxes / \$1 Invested
2014-2015	\$17,977,960	\$2,462,391	\$7.30
2015-2016	\$18,314,582	\$2,438,484	\$7.51
Total	\$36,292,542	\$4,900,875	<b>\$7.41</b>

<sup>20</sup> *ibid*

<sup>21</sup> Calculated by dividing Total State and Local Taxes by Total Adjusted Funding from Table 2-3

## 4 CONCLUSIONS

The UCF Business Incubation Program provides client companies with the experience and insight needed to create successful companies through relationships it has created with its network of experienced entrepreneurs, professional service providers, economic development partners, small business service providers, university experts as well as a dedicated staff.

Structured as an economic development partnership between the University, private enterprises, and local governments throughout the region, the UCF Business Incubation Program provides emerging companies with a wide variety of support and guidance to help facilitate their growth and success. Incubation team members and partners from the professional community provide expert help and insight in a variety of areas, including leadership training, market research, business plan development, and funding strategies.

Tom O'Neal, Ph.D., founder and executive director of the UCFBIP also recognizes the importance of these partnerships. *"I would like to recognize and thank the economic development organizations and community partners in the counties we serve. The invaluable contributions they make toward helping us support emerging companies, stimulate job growth and strengthen local economies enable us to fortify the region's innovation culture by providing ready access to our incubation services. We could not achieve the caliber of impact or generate impressive fiscal returns year after year without their continued collaboration and support,"* said Dr. O'Neal.

With the wealth of talent and resources developed by UCF and the benefits of its prime locations, the UCF Business Incubation Program is making a significant contribution to the economic development of the region. Combined with efforts by other organizations such as: Florida Angel Nexus, UCF Venture Accelerator; UCF Center for Entrepreneurship & Innovation, the Florida High Tech Corridor Council; the Metro Orlando Economic Development Commission, the National Entrepreneur Center; SBDC at UCF; and many others, the region is already recognized as one of the nation's premier locations for developing high growth/impact enterprises.

For the 2014/15 and 2015/16 fiscal years<sup>22</sup>, participating client firms have sustained more than 4,710 local jobs and have had a cumulative impact of over \$725 million in regional GDP and over \$1.31 billion on regional sales.

This current update illustrates that through good management; careful client selection and training; focused education of clients; and on-going follow-up support, the UCFBIP has managed to develop a stabilized network of facilities while maintaining its high standards of accountability and success.

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<sup>22</sup> It is also important to note that several UCFBIP graduates have moved out of Florida since 2000. These firms have created thousands of jobs since their departure from Florida.

It's these standards that have enabled UCFBIP receive numerous awards over the years. In 2004, UCFBIP was nationally recognized as the *Incubator of the year*. In 2012, UCFBIP client BDG Construction Services was nationally recognized as *Non-Tech Incubator Graduate of the year*. In 2012, UCFBIP client Hometown Health TV was nationally recognized as *Non-Tech Incubator Client of the year*. In 2013, UCFBIP was nationally recognized as the *Incubator Network of the Year*. In 2014, UCFBIP client Optigrate was nationally recognized as *Technology Incubator Graduate of the Year*. In 2014, UCFBIP was especially honored to have the representative from their city and county partners proclaim October 1, 2014 as UCF Business Incubation Program Day.

Once again, the UCFBIP has demonstrated that it provides an extremely productive and efficient tool for creating and supporting quality jobs and economic activity for the Central Florida region and beyond. During the most turbulent economic times in recent memory, the UCFBIP has been a job-producing "machine" bringing forth in the local economy a variety of businesses and employers that demonstrate sound management practices and potential for continued growth.

## 5 APPENDIX: IMPLAN INFORMATION

### *What is IMPLAN?*<sup>23</sup>

IMPLAN® is an acronym for IMpact analysis for PLANning. The IMPLAN® System is a general input-output model that is comprised of software and regional data sets. One of the most powerful aspects of IMPLAN®, is that input-output Models for specific regional economies can be created for the intervention for which the economic impact is being modelled.

The input for IMPLAN model is usually determined by the intervention being modelled. There are four requirements for the input: the location of the intervention, the time period for the intervention, the industry affected by the intervention, and the number of jobs and/or the revenue generated by the intervention being modelled. This input will represent the *direct* impact as described in the Table 1-1 below. Given this input IMPLAN will model the output which entails the *indirect* and *induced* impact while also informing on the regional impact of the intervention in the form of regional economic output (sales), regional value added (GDP), state and local taxes generated, and federal taxes generated.

Rather than extrapolating regional data from national averages, IMPLAN® measures economic impacts from data representing actual local economies. IMPLAN® data sets are available from the ZIP Code level to the national level, and regional files can be combined to create precise geographic definitions when calculating impacts. The analysis results provide the IMPLAN® user or client with a report that demonstrates the detailed effects of local changes on supporting industries and households. Reports can provide both detailed and summary information related to job creation, income, production, and taxes. IMPLAN® Version 3.0 can even track the impacts of a local change on surrounding regional economies.

Table 1-1: Definition of IMPLAN Terms

IMPLAN Term	Definition
Backward Linkages	The tracking of industry purchases backward through the supply chain.
Direct Impact	The initial expenditures, or production, made by the industry experiencing the economic change.
Indirect Impact	The effects of local inter-industry spending through the backward linkages.
Induced Impact	The results of local spending of employee's wages and salaries for both employees of the <i>Directly Impacted</i> industry, and the employees of the Indirectly affected industries.

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<sup>23</sup> The following section contains excerpts from various sections of "Day, F. (2012). *Principles of Impact Analysis and IMPLAN Applications*. Davidson, NC, USA: MIG"

IMPLAN® data tracks all the available industry groups in every level of the regional data. This permits detailed impact breakdowns and helps ensure accuracy of inter-industry relationships. If a study involves the introduction of an industry group that does not already exist in the local area, IMPLAN® provides tools to create a new industry. This new industry can be used as a proxy to estimate the likely impacts of the new industry's production to the local economy. And if the industry exists in IMPLAN®, but doesn't exactly match the sales and employment information for the industry being modeled, the IMPLAN® industry relationships may be updated to match the known values, while still maintaining the local regional sales and employment averages for examining the Indirect and Induced impacts.

Figure 1-1 illustrates the framework of the IMPAN model. Economic impact studies typically generate large amounts of information about local industries, employment, wages, profits, labor spending, and taxes that may be useful for a variety of purposes and circumstances. Most reports, therefore, seek to condense this information into a format that demonstrates the overall effect of the economic change as it relates to jobs or other monetary means, and in a manner that is meaningful to the report's intended audience. To generate the detailed background information that supports the overall affects economic factors have on the local region, or even on surrounding regions, economic impact analysis looks backwards rather than forwards through the economy. In other words, to determine the effect of increased production in a local industry, economic analysis looks at the industries which supply the producing industry with the items and services that industry incorporates into its production.

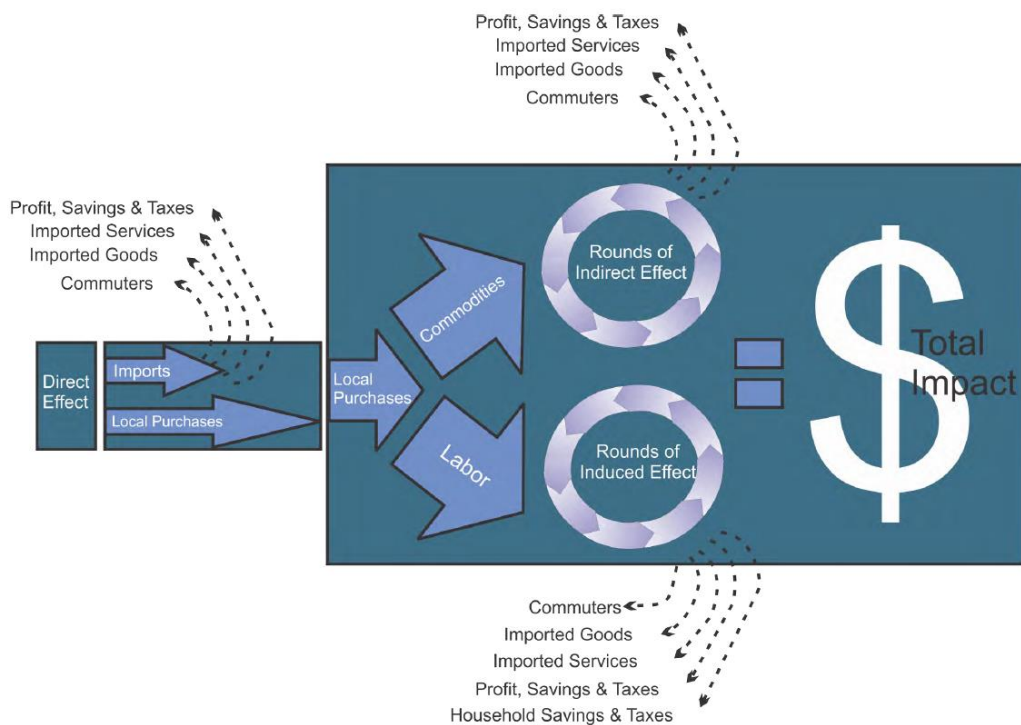


Figure 5-1: IMPLAN Model framework



So an increase in window production will result in the manufacturer purchasing a variety of supplies including wood, glass, and furnishings for the windows, all of which will be incorporated into the final product. Collectively, tracing the impacts back through the supply chain is tracing the *backward linkages*. Each supplier in the chain represents a backward linkage. Since each supplier of an industry has to purchase inputs from other suppliers in order to create their own products (e.g. the window furniture company has to purchase sheet metal from which it stamps out its parts), the accumulation of these backward linkages can be tracked until the resultant spending of the original impact is completely removed from the economy by imports, savings, taxes and profits.

These consecutive rounds of inter-industry spending traveling back through the supply chain are called the *Indirect Effects*. These impacts are “indirect” because the increase in this industry’s production is stimulated by the increase of sales in another industry. Increases in production not only require an increase in purchases of supplies, but typically also require an increase in employment and/or labor spending. This increase in labor dollars also has traceable economic effects, because increased labor dollars typically translate into increased income spending. The spending of income earned by the employees, resulting from both *Directly and Indirectly affected* industries, contributes to the *Induced Effect*. The Induced Effect, therefore, is a measurement of employee spending of all employees of the *Directly affected* industry, and all the employees of subsequent Indirectly impacted industries in the supply chain, as long as these employees live within the defined geography of the study.

IMPLAN also reports on the State/Local Taxes collected as a result of the modeled scenario. In the *Employee Compensation* field, IMPLAN reports on the amount of the employer collected and paid social security taxes on wages. For, state/local taxes these values are mostly contributions to government retirement funds. Taxes on *Production and Imports* are collected by the businesses on behalf of the State and local governments. These taxes include sales tax, property tax, motor vehicle tax, severance tax, business licenses taxes, and documentary and stamp taxes. Taxes reported under *Households* include personal income tax (none for Florida), personal vehicle fee payments, personal property taxes, fines, donations, and licensing fees. Taxes on *Corporations* include corporate tax payments on profits and dividends paid to governments on government investments.



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