

DECEMBER 1, 2017



PINELLAS COUNTY

ECONOMIC DEVELOPMENT

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2017 CLUSTER ANALYSIS REPORT

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Introduction

This report is a cluster analysis of industries within Pinellas County used in order to determine the region's economic specializations. It starts with a high level overview of the local economy compared with three reference areas: the national economy, the state of Florida, and the Tampa-St Petersburg-Clearwater metropolitan statistical area. The initial analysis is conducted using two digit North American Industry Classification System (NAICS) codes and paints a broad brushed picture of the local economy. It uses data from the Bureau of Labor Statistics (BLS) and compares information from 2012 and 2016.

The following sections of the report then delve into more specific instances of cluster analysis regarding the qualified target industries (QTIs) that Pinellas County pays particular attention to attracting and promoting within the community. QTIs generally have high wage and high skill jobs and they are primary employers within the community. The macro strategy is based on the premise that developing these particular industries will help ensure more broad based prosperity for other industries in the region. That section of the report was created using data from Economic Modelling Services' EMSI tool and compares data from 2012 and 2017.

Cluster Analysis Overview

Cluster Analysis is a technique originally pioneered to measure industrial agglomeration in specific areas in order to best understand a region's relative strengths and weaknesses. At a theoretical level, a "balanced" local economy would have equal shares in all industrial categories as its reference geography. More concretely, if a "balanced" city were compared with its encompassing state both the city and state would have equal shares of their economies devoted to industries such as agriculture, manufacturing, and finance. The reality however is that local economies specialize and focus on particular industries. Broad examples are that rural communities have higher shares of agricultural employment, college towns have more education jobs, and big cities tend to have more professional services.

This report analyzes Pinellas County in relation to the Tampa-St. Petersburg-Clearwater MSA (Pinellas, Hillsborough, Pasco, and Hernando Counties), the state of Florida, and the United States as a whole. By providing perspectives at different geographic layers, it becomes clear how Pinellas compares. The analysis uses two digit NAICS codes to provide a high level overview of Pinellas County's economic specialization. NAICS is a hierarchical categorization system that is administered by the federal Office of Management and Budget that categorizes all employers into industrial "families". Families start at broad categories, e.g. NAICS 52 - finance and insurance, then eventually get to highly specified codes, NAICS 524114 – direct health and medical insurance carriers, with intermediate groupings in between.

The most important tool in a cluster analysis is *location quotient* (LQ). LQ is determined by simple arithmetic as the percentage of workers employed in a field in a region are divided by the percentage of workers employed in that field in the reference area ($E_{\text{Local}}/E_{\text{Ref}} = \text{LQ}$). If 10% of employment in a city is in manufacturing and only 5% of the state is employed in manufacturing, then the city's LQ, compared to the state would be 2 as $(10\%)/(5\%)=2$.

A LQ value greater than 1 indicates a relatively higher concentration on an industry while a value less than 1 indicates that the industry is in a lower concentration than the reference area. A LQ value greater than 1 also indicates that a locality is an industrial exporter that provides goods and services to the reference area. Sectors with LQ's greater than 1 also bring money into a community. Conversely, an LQ less than 1 indicates that a region must import goods and services from the reference area. A consequence of industries with location quotients below 1 is that money must leave a community in order to acquire those goods and services.

2016 Analysis

Table 1 Percentage Employment in Each Industry

NAICS Sector	Pinellas	MSA	Florida	USA
NAICS 11 Agriculture, forestry, fishing and hunting	0.04%	0.78%	0.90%	0.89%
NAICS 21 Mining, quarrying, and oil and gas extraction	0.00%	0.03%	0.05%	0.43%
NAICS 22 Utilities	0.16%	0.35%	0.35%	0.57%
NAICS 23 Construction	5.07%	5.62%	5.76%	4.84%
NAICS 31-33 Manufacturing	7.57%	5.20%	4.27%	8.70%
NAICS 42 Wholesale trade	3.14%	3.75%	4.09%	4.13%
NAICS 44-45 Retail trade	12.93%	13.41%	13.30%	11.20%
NAICS 48-49 Transportation and warehousing	1.55%	2.54%	3.50%	4.03%
NAICS 51 Information	1.63%	1.97%	1.66%	2.07%
NAICS 52 Finance and insurance	4.64%	6.15%	4.39%	4.13%
NAICS 53 Real estate and rental and leasing	2.45%	2.07%	2.20%	1.53%
NAICS 54 Professional and technical services	7.23%	7.79%	6.40%	6.30%
NAICS 55 Management of companies and enterprises	3.36%	2.14%	1.21%	1.57%
NAICS 56 Administrative and waste services	6.16%	7.17%	7.88%	6.37%
NAICS 61 Educational services	6.42%	6.76%	7.10%	8.76%
NAICS 62 Health care and social assistance	16.79%	14.83%	13.95%	14.69%
NAICS 71 Arts, entertainment, and recreation	1.86%	2.08%	2.78%	1.85%
NAICS 72 Accommodation and food services	11.26%	10.05%	11.54%	9.45%
NAICS 81 Other services, except public administration	2.99%	2.93%	3.29%	3.12%
NAICS 99 Unclassified	0.04%	0.05%	0.05%	0.20%
NAICS 92 Public administration	4.70%	4.34%	5.34%	5.15%

Table 2 %Employment Pinellas/%Employment Reference

Pinellas vs...	MSA	State	USA
NAICS 11 Agriculture, forestry, fishing and hunting	0.05	0.04	0.04
NAICS 21 Mining, quarrying, and oil and gas extraction	0.09	0.05	0.01
NAICS 22 Utilities	0.47	0.47	0.29
NAICS 23 Construction	0.90	0.88	1.05
NAICS 31-33 Manufacturing	1.46	1.77	0.87
NAICS 42 Wholesale trade	0.84	0.77	0.76
NAICS 44-45 Retail trade	0.96	0.97	1.15
NAICS 48-49 Transportation and warehousing	0.61	0.44	0.38
NAICS 51 Information	0.83	0.98	0.79
NAICS 52 Finance and insurance	0.75	1.06	1.12
NAICS 53 Real estate and rental and leasing	1.18	1.11	1.60
NAICS 54 Professional and technical services	0.93	1.13	1.15
NAICS 55 Management of companies and enterprises	1.57	2.79	2.14
NAICS 56 Administrative and waste services	0.86	0.78	0.97
NAICS 61 Educational services	0.95	0.91	0.73
NAICS 62 Health care and social assistance	1.13	1.20	1.14
NAICS 71 Arts, entertainment, and recreation	0.90	0.67	1.01
NAICS 72 Accommodation and food services	1.12	0.98	1.19
NAICS 81 Other services, except public administration	1.02	0.91	0.96
NAICS 99 Unclassified	0.83	0.78	0.19
NAICS 92 Public administration	1.08	0.88	0.91

Examining the 2016 LQ values provides an informative initial glimpse into the local economy. Compared to the rest of the Tampa-St Pete-Clearwater MSA, Pinellas has high LQ values for industries such as manufacturing, real estate, management, health care and social assistance, accommodation and food services, other services, and public administration. However, a high LQ value compared to the MSA does not necessarily translate into a high value when

compared to a different reference geography. By the same token, a low local LQ value does not necessarily mean a low LQ value when compared to the state and national level. Manufacturing is a prime example of an industry where Pinellas is strongly concentrated compared with the state and local level, but has a lower concentration than at the national level. This line of reasoning suggests that regional and national economic characteristics should be taken into account when looking at industries. In this case, Pinellas is heavily industrialized, but in a largely non-industrial state. Regarding the inverse, Pinellas has relatively low local concentration of professional and technical services occupations when compared with the MSA, but a higher than average concentration than the state and national level.

One of the more interesting propositions is to examine how tourism related sectors are distributed compared with reference locations. Tourism heavy local economies tend to have higher concentrations of employment in the retail trade; arts, entertainment, and recreation; and the accommodation and food services industries. Compared to the national economy, it is clear that Pinellas County has an advantage in those three sectors. Interestingly, at the MSA level, Pinellas outperforms the region in accommodation and food services, but underperforms in retail trade and arts, entertainment, and recreation sectors. Compared to the state of Florida as a whole, Pinellas actually has a lower concentration of jobs in all three industries. The perspective gleaned is that Pinellas County as a whole does depend on tourism as a local economic pillar, but less so than the rest of Florida. Quirks like these are important for understanding what makes a local economy unique as any industry can “flip” from being highly to sparsely concentrated depending on the perspective used.

Another interesting tidbit is to examine demographically and geographically influenced sectors. Demographically, Pinellas County is in an interesting position because it has higher amounts of employment in the health care sector compared with all three reference levels and has lower employment in the education sector. This makes sense because Pinellas County has a higher median age and larger retired population than other regions. Geographically, Pinellas is highly urbanized, so unsurprisingly it has a proportionately low number of employees in the agriculture and mining sectors.

NAICS Cluster Analysis

Pinellas vs...	MSA	State	USA	2012-2016 LQ Change	MSA	Florida	USA
NAICS 11 Agriculture, forestry, fishing and hunting	0.05	0.04	0.04	NAICS 11 Agriculture, forestry, fishing and hunting	93.1%	97.1%	57.7%
NAICS 21 Mining, quarrying, and oil and gas extraction	0.09	0.05	0.01	NAICS 21 Mining, quarrying, and oil and gas extraction	-56.2%	-68.5%	-58.4%
NAICS 22 Utilities	0.47	0.47	0.29	NAICS 22 Utilities	75.2%	90.6%	82.3%
NAICS 23 Construction	0.90	0.88	1.05	NAICS 23 Construction	-1.8%	-4.9%	4.8%
NAICS 31-33 Manufacturing	1.46	1.77	0.87	NAICS 31-33 Manufacturing	-1.2%	-3.5%	-0.4%
NAICS 42 Wholesale trade	0.84	0.77	0.76	NAICS 42 Wholesale trade	-0.1%	2.1%	0.4%
NAICS 44-45 Retail trade	0.96	0.97	1.15	NAICS 44-45 Retail trade	-3.3%	-0.2%	0.3%
NAICS 48-49 Transportation and warehousing	0.61	0.44	0.38	NAICS 48-49 Transportation and warehousing	-6.5%	-5.5%	-7.4%
NAICS 51 Information	0.83	0.98	0.79	NAICS 51 Information	-1.8%	-4.7%	-11.1%
NAICS 52 Finance and insurance	0.75	1.06	1.12	NAICS 52 Finance and insurance	-11.8%	-10.7%	-11.3%
NAICS 53 Real estate and rental and leasing	1.18	1.11	1.60	NAICS 53 Real estate and rental and leasing	13.6%	20.2%	18.0%
NAICS 54 Professional and technical services	0.93	1.13	1.15	NAICS 54 Professional and technical services	2.7%	6.3%	6.2%
NAICS 55 Management of companies and enterprises	1.57	2.79	2.14	NAICS 55 Management of companies and enterprises	5.4%	18.5%	21.2%
NAICS 56 Administrative and waste services	0.86	0.78	0.97	NAICS 56 Administrative and waste services	5.3%	-2.3%	0.6%
NAICS 61 Educational services	0.95	0.91	0.73	NAICS 61 Educational services	2.2%	-0.4%	-4.0%
NAICS 62 Health care and social assistance	1.13	1.20	1.14	NAICS 62 Health care and social assistance	-2.7%	-3.8%	-8.5%
NAICS 71 Arts, entertainment, and recreation	0.90	0.67	1.01	NAICS 71 Arts, entertainment, and recreation	-7.2%	-8.1%	-10.2%
NAICS 72 Accommodation and food services	1.12	0.98	1.19	NAICS 72 Accommodation and food services	2.6%	2.9%	2.4%
NAICS 81 Other services, except public administration	1.02	0.91	0.96	NAICS 81 Other services, except public administration	2.4%	-1.0%	11.8%
NAICS 99 Unclassified	0.83	0.78	0.19	NAICS 99 Unclassified	-39.0%	-8.0%	-29.6%
NAICS 92 Public administration	1.08	0.88	0.91	NAICS 92 Public administration	4.4%	5.7%	1.0%

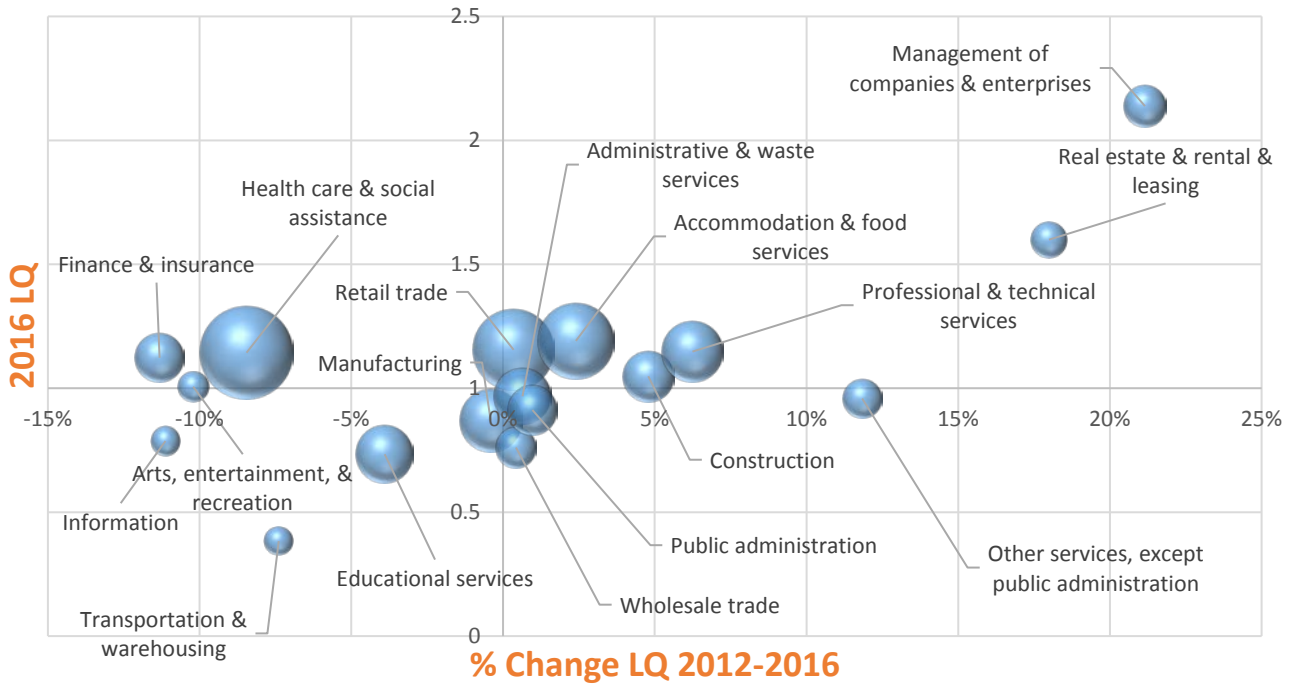
The tables above can be used to start categorizing and understanding the economic trends from 2012 to 2016. The next step is to compare the LQ data from two separate years. The change in the LQ value provides context as to whether an

industry is becoming more or less concentrated in an area and helps to later categorize the industry in an overall framework. There are four categories that industries can fit into under these circumstances.

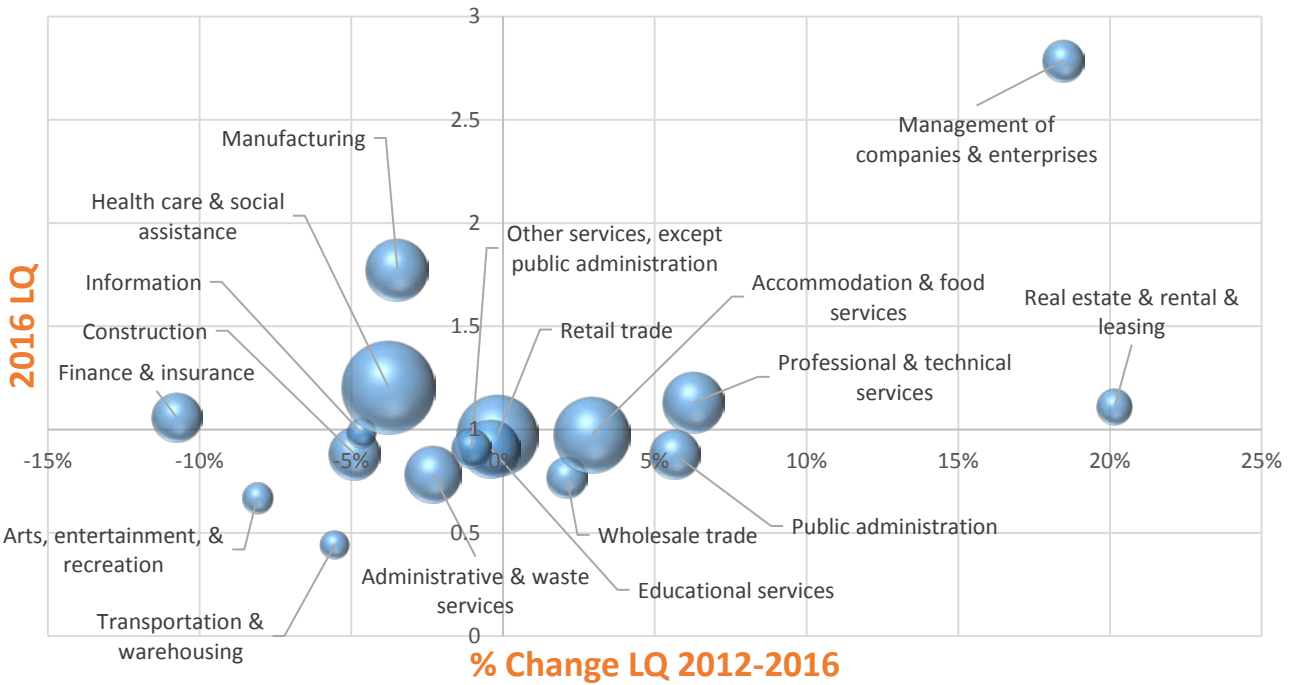
	$\Delta LQ < 0$	$\Delta LQ > 0$
LQ > 1	Mature: Larger and usually older well entrenched industries. They are growing slower than the rest of the economy often because they are already established with large employment bases.	Star: Economic engines that are growing quickly and from a well-established strong point.
LQ < 1	Transforming: Usually smaller industries that are growing slowly or shrinking in a particular area. Often geographic reasons are partially to blame.	Emerging: Nascent industries that are expanding quickly and gaining a foothold in the local economy.

The following section uses bubble charts to analyze local industries. Bubble charts are a useful tool in cluster analysis because they measure three sets of data as opposed to two like most graphs. Bubble size is a relative measure of the number of jobs in each economic sector. Bigger bubbles have larger employment in Pinellas County and smaller bubbles employee fewer workers. Industries with fewer than 1000 employees were excluded from the charts to make them clearer.

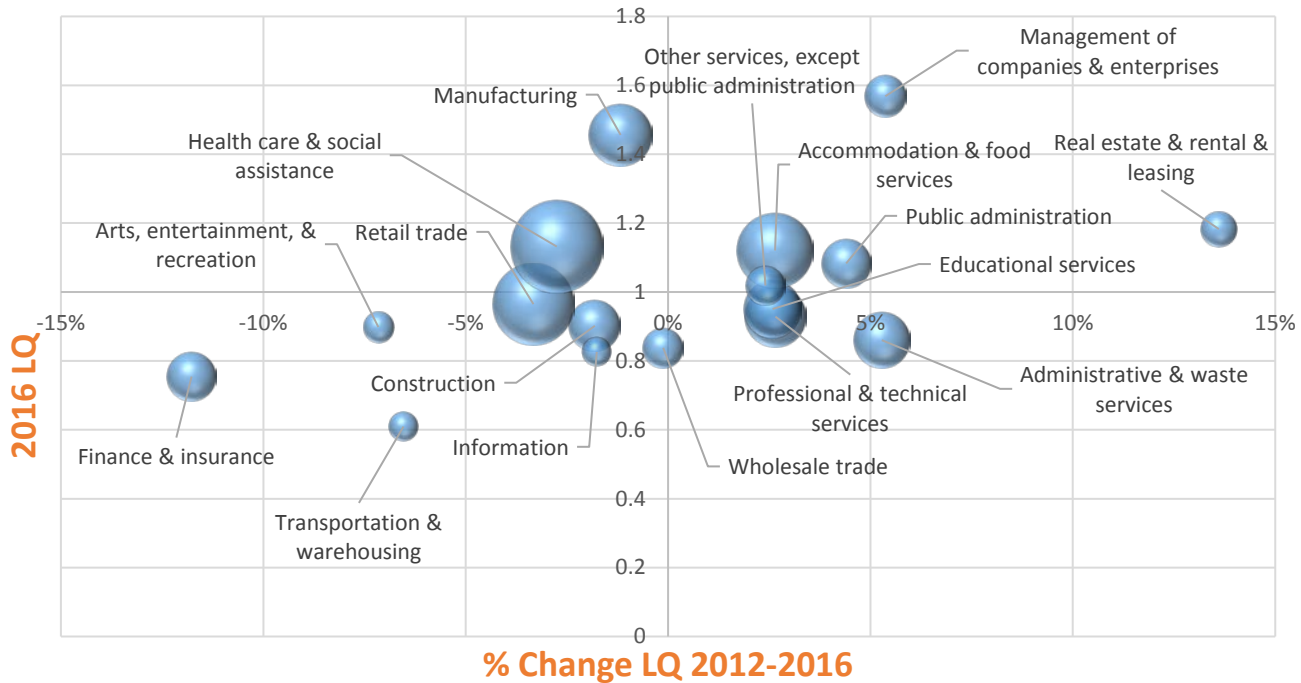
Pinellas/USA LQ



Pinellas/Florida LQ



Pinellas/MSA LQ



NAICS	MSA	Florida	USA
NAICS 11 Agriculture, forestry, fishing and hunting	Emerging	Emerging	Emerging
NAICS 21 Mining, quarrying, and oil and gas extraction	Transforming	Transforming	Transforming
NAICS 22 Utilities	Emerging	Emerging	Emerging
NAICS 23 Construction	Transforming	Transforming	Star
NAICS 31-33 Manufacturing	Mature	Mature	Transforming
NAICS 42 Wholesale trade	Transforming	Emerging	Emerging
NAICS 44-45 Retail trade	Transforming	Transforming	Star
NAICS 48-49 Transportation and warehousing	Transforming	Transforming	Transforming
NAICS 51 Information	Transforming	Transforming	Transforming
NAICS 52 Finance and insurance	Transforming	Mature	Mature
NAICS 53 Real estate and rental and leasing	Star	Star	Star
NAICS 54 Professional and technical services	Emerging	Star	Star
NAICS 55 Management of companies and enterprises	Star	Star	Star
NAICS 56 Administrative and waste services	Emerging	Transforming	Emerging
NAICS 61 Educational services	Emerging	Transforming	Transforming
NAICS 62 Health care and social assistance	Mature	Mature	Mature
NAICS 71 Arts, entertainment, and recreation	Transforming	Transforming	Mature
NAICS 72 Accommodation and food services	Star	Emerging	Star
NAICS 81 Other services, except public administration	Star	Transforming	Emerging
NAICS 99 Unclassified	Transforming	Transforming	Transforming
NAICS 92 Public administration	Star	Emerging	Emerging

Summary across Geographies

As some general notes regarding the charts, there are a handful of industries that are consistent across all three reference geographies, but more commonly industries can be interpreted differently based on the perspective that is

used. What should be noted also from the chart is that industries that have very small employment bases to start from can see massive swings in their LQs. The utilities and the agriculture, forestry, and fishing sectors illustrate this point because their modest employment gains have caused them to be categorized as emerging industries. Some of the commentary in the next few paragraphs mentions general employment trends based off the State of Florida's Quarterly Census of Employment and Wages (QCEW) ES-202 employment data.

The management of companies and enterprises and real estate sector both have a star designation across all references. The growth of management and enterprises can be explained thanks to Pinellas County's strength in attracting corporate relocations and overall business friendly climate. Two theories as to why real estate is such a strong industry are that Pinellas County has a highly mobile population with a large number of transplants in need housing and that from 2012-2016 there was strong growth in the homestay or real estate sharing economy. Companies such as Airbnb and VRBO rapidly expanded during this time. To illustrate the point, in 2012 there were 45 listings in St. Petersburg on Airbnb and by 2016 the number had grown to 1300. Because of quirks in the NAICS classifications, a property manager in charge of these listings would be classified as working in the real estate industry even though, from a practical perspective, said property manager would be little different from a hotelier.

Broadly, professional and technical services represents an area of opportunity in Pinellas County. Surprisingly, even though Pinellas has a strong position as a center for professional services compared to the national and the state level, the region still has a LQ that lags behind the Tampa-St Pete-Clearwater MSA. The emerging designation and quicker growth in Pinellas, compared with all other references shows that there could be greater opportunities to target more "white collar" business and promote the growth of local firms in this segment. Some of the strongest employment gains within the sector are from employment in management and technical consulting. Advertising services and payroll services all also saw substantial gains, but the fastest growth appears concentrated within "title abstract and settlement offices". This field is essentially composed of non-lawyers handling paperwork in the booming real estate industry.

Information is an interesting conundrum of a category because the two digit classification is so broad. The information sector includes eclectic industries such as newspapers, telecommunications, movie theaters, and software publishing. On the whole the industry declined across the board in Pinellas (by LQ and employment) and nationally saw very slow growth during this time period. However, a closer parsing of the data reveals that broadly the decline can be attributed to print media and wired telecommunication carriers. Conversely, the software side of the information sector generally did fine.

Construction is an intriguing cluster because it is considered a transforming industry locally and statewide, but is a star industry compared with the rest of the county. This almost certainly has to do with the fact that the Tampa-St Pete-Clearwater MSA is one of the quickest growing areas in the nation and that the state of Florida also is experiencing rapid growth, but Pinellas is largely "built out" with little available greenfield land. The construction industry did gain jobs in Pinellas from 2012 to 2016, but did not gain as jobs as quickly as neighboring counties or the state did. One theory could be that proportionately more new home construction and retail construction has tended to be further on the MSA's periphery where land is cheaper and space is more plentiful. In Pinellas, much of the construction sector's growth has been within the specialty trade contractor category. Because there has been quicker growth in "specialty trade contractors" (NAICS 238), as opposed to employment growth in the "construction of [new] buildings" (NAICS 236), it can be inferred that much of the growth of construction has been from the renovation and rehabilitation of existing buildings.

Pinellas appears to have opportunities in certain forms of wholesale trade, but is limited in others. The county is classified as an emerging area for wholesale trade at the state and national level, but the industry is considered to be transforming at the MSA level. This may be because new warehouses and distribution centers are often located on the urban fringe where land is less expensive. Closer inspection of the data shows there were interesting changes that took place in parts of the sector. The distribution of beer and wine approximately doubled during this time period and this certainly is linked to the trend towards micro brewing. Distribution of manufactured items, particularly machinery and

hardware, saw solid gains. The transportation and warehousing sector is similar in that it is transforming across all geographies and likely for the same general reason of land scarcity. The county however had strong growth in the wholesale trade of software and computer products along with business to business sales carried out over electronic markets. Pinellas County may not be a good location for a large scale logistics hub, but the county does have a niche distributing locally manufactured and digital goods.

Much of the growth in administrative and waste services came from telemarketing and call centers, but there were significant changes in several other industries. The employment services sector saw healthy growth as, presumably, the expansion of other businesses support services such as human resources, benefits administration, and temporary help positions. One of the most positive signs in the economy may be the job losses that occurred among collection agencies!

Manufacturing had slight overall growth in the number of jobs, but its LQ value decreased across all levels. Diving into the sector, most constituent industries were near flat and had either small growth or small employment losses. Beverage manufacturing however by far saw the largest percentage increase in employment, but this came from a small initial base and is tied to the mushrooming craft brewing industry. Surprisingly, wood product manufacturing also saw large employment gains. At a more broad level, some of the manufacturing industries that gained the most employees were in the chemical manufacturing, plastics and rubber manufacturing fields, and machinery manufacturing fields. These gains however were somewhat offset by other manufacturers slowly bleeding employees.

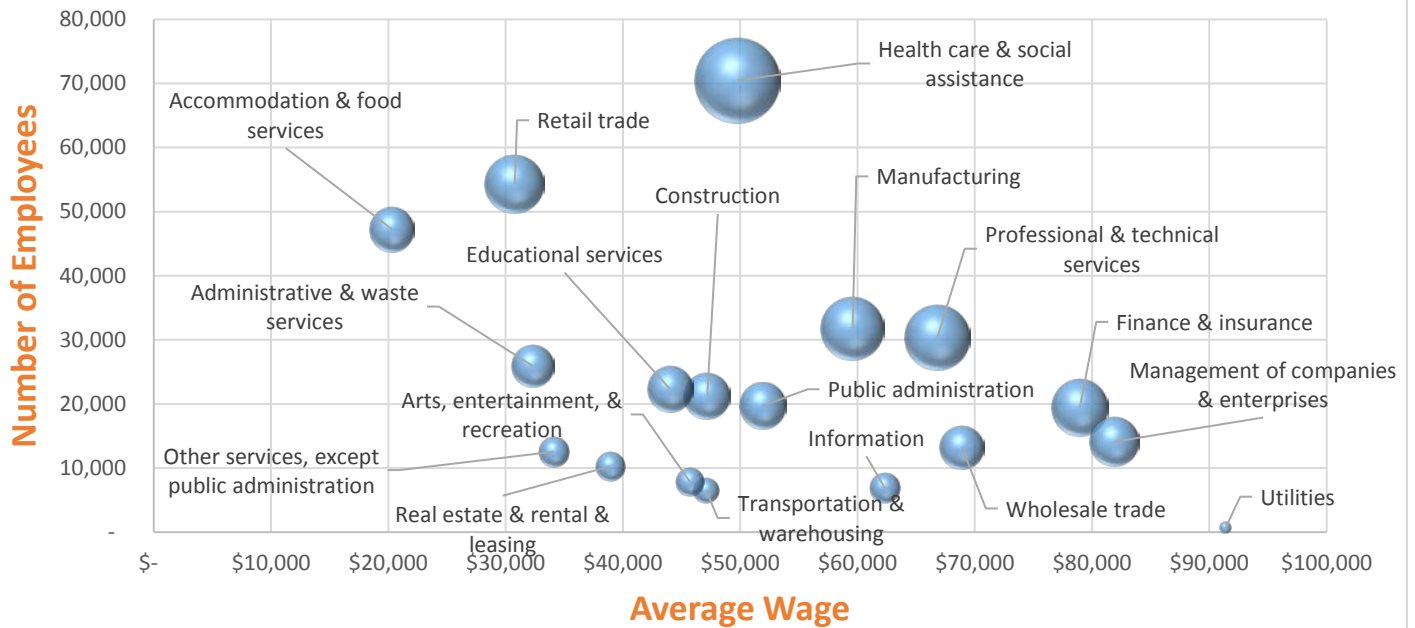
Accommodation and food services had strong growth as it increased in employment numbers and LQ substantially. The sector still lags the state of Florida, but has a higher concentration than the MSA and also the United State. The arts, entertainment, and recreation sector however declined in LQ compared to every geography. The sector's total employment was virtually flat between 2012 and 2016.

Employee Wages – 2016 BLS

	Employees	Total Wages	Avg Annual Wages	% Employment	% Wages	(%Wages)/(%Employment)
NAICS 11 Agriculture, forestry, fishing and hunting	157	\$ 3,883,001	\$ 24,732	0.0%	0.0%	0.53
NAICS 21 Mining, quarrying, and oil and gas extraction	11	\$ 434,296	\$ 39,481	0.0%	0.0%	0.84
NAICS 22 Utilities	684	\$ 62,508,982	\$ 91,387	0.2%	0.3%	1.95
NAICS 23 Construction	21,286	\$ 1,004,356,617	\$ 47,184	5.1%	5.2%	1.00
NAICS 31-33 Manufacturing	31,788	\$ 1,894,070,633	\$ 59,584	7.7%	9.7%	1.27
NAICS 42 Wholesale trade	13,184	\$ 908,506,039	\$ 68,910	3.2%	4.7%	1.47
NAICS 44-45 Retail trade	54,284	\$ 1,670,735,301	\$ 30,778	13.1%	8.6%	0.66
NAICS 48-49 Transportation and warehousing	6,486	\$ 305,411,783	\$ 47,088	1.6%	1.6%	1.00
NAICS 51 Information	6,840	\$ 426,422,126	\$ 62,342	1.6%	2.2%	1.33
NAICS 52 Finance and insurance	19,467	\$ 1,537,129,625	\$ 78,961	4.7%	7.9%	1.68
NAICS 53 Real estate and rental and leasing	10,264	\$ 399,272,166	\$ 38,900	2.5%	2.0%	0.83
NAICS 54 Professional and technical services	30,366	\$ 2,028,499,085	\$ 66,802	7.3%	10.4%	1.42
NAICS 55 Management of companies and enterprises	14,106	\$ 1,154,944,878	\$ 81,876	3.4%	5.9%	1.74
NAICS 56 Administrative and waste services	25,869	\$ 836,770,742	\$ 32,346	6.2%	4.3%	0.69
NAICS 61 Educational services***	22,334	\$ 982,981,711	\$ 44,014	5.4%	5.0%	0.94
NAICS 62 Health care and social assistance	70,461	\$ 3,505,477,392	\$ 49,751	17.0%	18.0%	1.06
NAICS 71 Arts, entertainment, and recreation	7,823	\$ 357,690,840	\$ 45,723	1.9%	1.8%	0.97
NAICS 72 Accommodation and food services	47,243	\$ 959,921,286	\$ 20,319	11.4%	4.9%	0.43
NAICS 81 Other services, except public administration	12,549	\$ 428,166,577	\$ 34,120	3.0%	2.2%	0.73
NAICS 99 Unclassified	164	\$ 6,725,799	\$ 41,011	0.0%	0.0%	0.87
NAICS 92 Public administration	19,725	\$ 1,024,653,131	\$ 51,947	4.8%	5.3%	1.11

*** Estimated because of data suppression. Employment figures based on percentage of population under 18. Average wage used is for entire state of Florida.

Employment, Wages, and Total Payroll by Industry

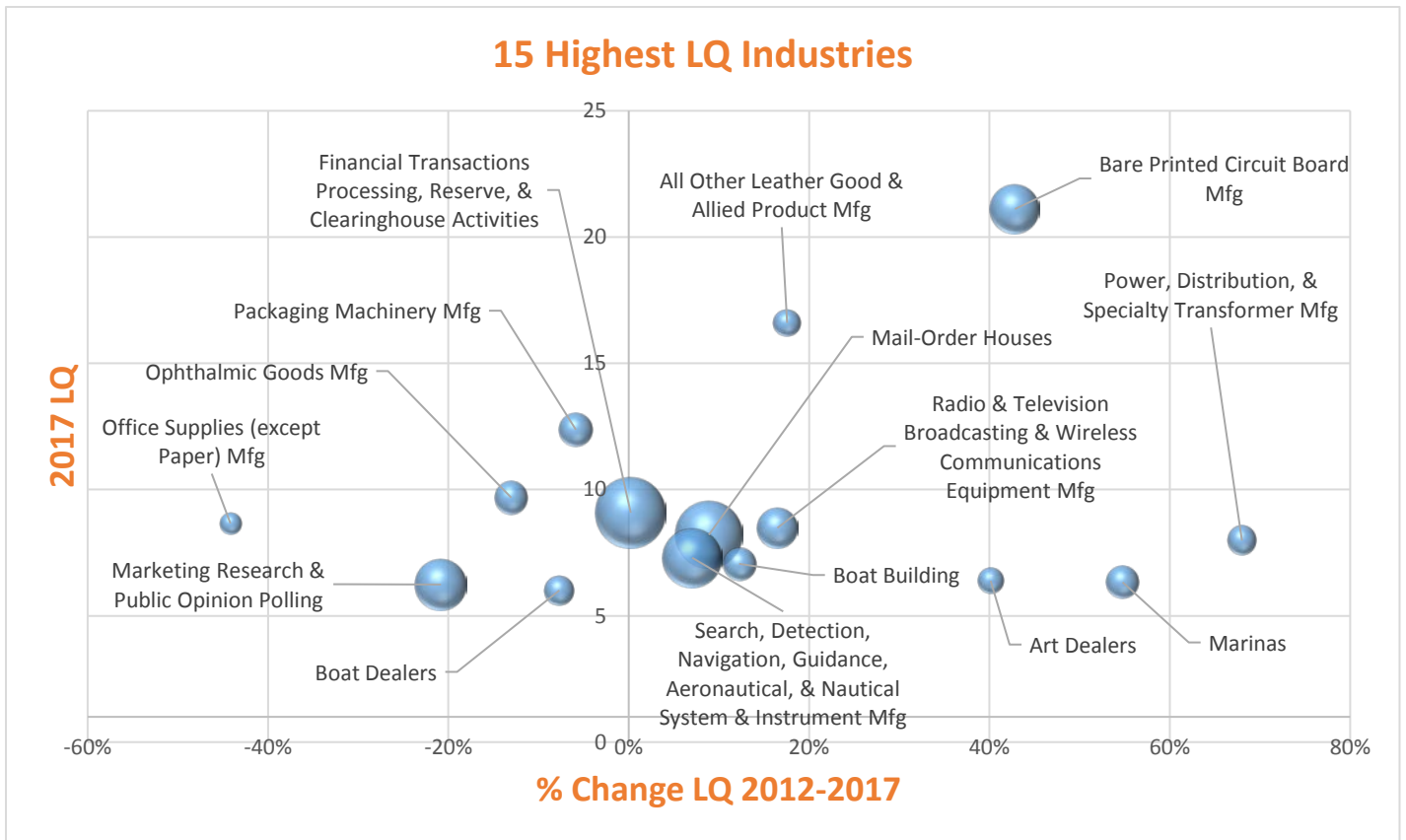


Bubble size represents how large the annual payroll is for industries. Industries with fewer than 200 employees were excluded from the chart.

Important also is to consider the wages paid by each industry and how they compare. Some of the mature industries, like manufacturing and health care, pay above average wages even though they have not seen quick employment growth. Management, utilities, and professional occupations are all bright spots that have seen quick growth not only in the number of employees and their LQs, but also they have significantly higher than average wages.

An area of concern is that some of the industries with the fastest employment growth have been in low wage sectors. Real estate and the accommodation and food service sectors are some of the prime examples of quickly growing low wage sectors. There has been part of a nationwide trend that the economic recovery has largely seen growth in low wage service industry fields.

The rightmost column in the above table shows the wage quotient (WQ) for various industries. As a measure, the WQ is a good method to identify high wage industries and put their relative earnings in perspective. The WQ value can be thought of as identifying how well an industry in a certain field pays compared to an average job in the county. The well-paying management sector gathers 5.9% of all wages earned in Pinellas even though it only employs 3.4% of all workers so its WQ=1.74 and the average management job pays 74% better than the average general job in the county. Attracting high wage and highly clustered jobs is important for the county because they are able to support the retail and service industries that rely on discretionary income spending.



The next step in the cluster analysis is using EMSI to drill down deeper into the specific data for 6 digit NAICS codes to get a more granular analysis of local economic trends. EMSI was used in this analysis for two reasons. First EMSI models do not have data suppression like the Bureau of Labor Statistics reports. The BLS hides information when there are only a few firms working in a specific field. Second the data EMSI uses is slightly more current. While BLS data provides employment in the public sector that is useful for analyzing broader economic trends, the more specific information EMSI has is more valuable for closer inspection.

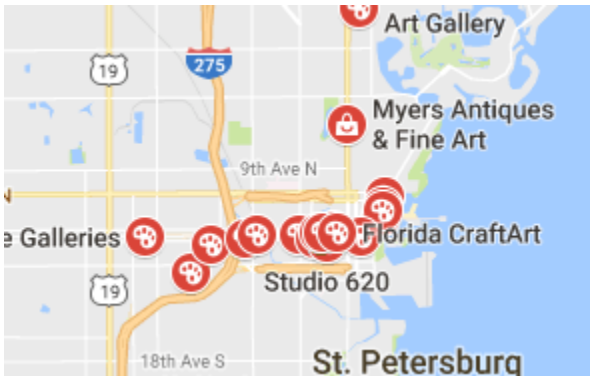
Large Employers: Highly Clustered
HSN
Valpak
Jabil Circuit
Agora Leather Products
Intrepid Powerboats
The Nielsen Company

The first chart shows the fifteen industries that have the highest LQ values compared to the United States as a whole. Some of these have been targeted by the county, but others evolved more organically. The boating industries (boat manufacturing, boat dealers, and marinas) are a classic example of naturally occurring and complementary industries that are prominent thanks to the county’s location on the Gulf of Mexico and its preexisting manufacturing base.

Many of the most heavily concentrated industries in Pinellas are highly specialized forms of manufacturing. Some, like ophthalmic goods, are targeted industries that the county has purposely sought to attract. Others are the result of a single or small number of very large employers with large workforces. Manufacturing among the most clustered industries runs the gamut in regards to what they make and their levels of technical expertise. Some, like boat building and leatherworking, would appear to have a much more artisanal and almost craft like aspect to them. Others, like the numerous forms of electronics manufacturing are more high tech.

Interestingly, there are very few sales and service related industries within this group. The marketing research & public opinion polling along with the financial transaction processing industries are likely due to a handful of large firms with major offices in Pinellas County. Art dealers however are a much more curious industry to see highly clustered. The large number of art dealers could be related in part to the tourism economy or potentially the large number of snowbirds and

new arrivals in the area looking to decorate their residences. Another reason for the large concentration of art galleries could be because St Petersburg in particular has targeted art attractions and art districts as part of the downtown redevelopment plans. A quick glance in Google Maps shows the largest densities of galleries is inside and nearby downtown St Petersburg.



Google Maps "Art Gallery" search results

The large number of art galleries however is somewhat puzzling because local related industries do not appear to have nearly as high of location quotient values. Whereas art dealers have a location quotient of 6.39, only commercial screen printing (1.92), graphic design services (1.42), and other specialized design services (1.05) have LQ values greater than 1. Industries along the lines of independent artists, writers, and performers (0.92), fine art schools (0.64), museums (0.54), and agents for artists, athletes, entertainers, and other public figures (0.51) all have LQs below 1. In part this could be because employment data often has difficulty picking up the self-employed and misses out on independent artists and related professionals. A stroll through local galleries confirms that most of

art being sold is either indigenous or at least regional. This implies that there could be a disconnection between the abstract data and facts on the ground. Another reason why the art dealing industry is so concentrated could be because the Wendover Art Group is a major art manufacturer, secondary dealer, and employer in the region that in many cases imports art and then resells it.

QTIs

QTIs, qualified targeted industries, are specific industries that Pinellas is trying to attract. These industries tend to have high wage occupations and support many other jobs in the local economy. The targeted groups of industries are:

Life Sciences and Medical Technology

Information Technology

Defense and Homeland Security

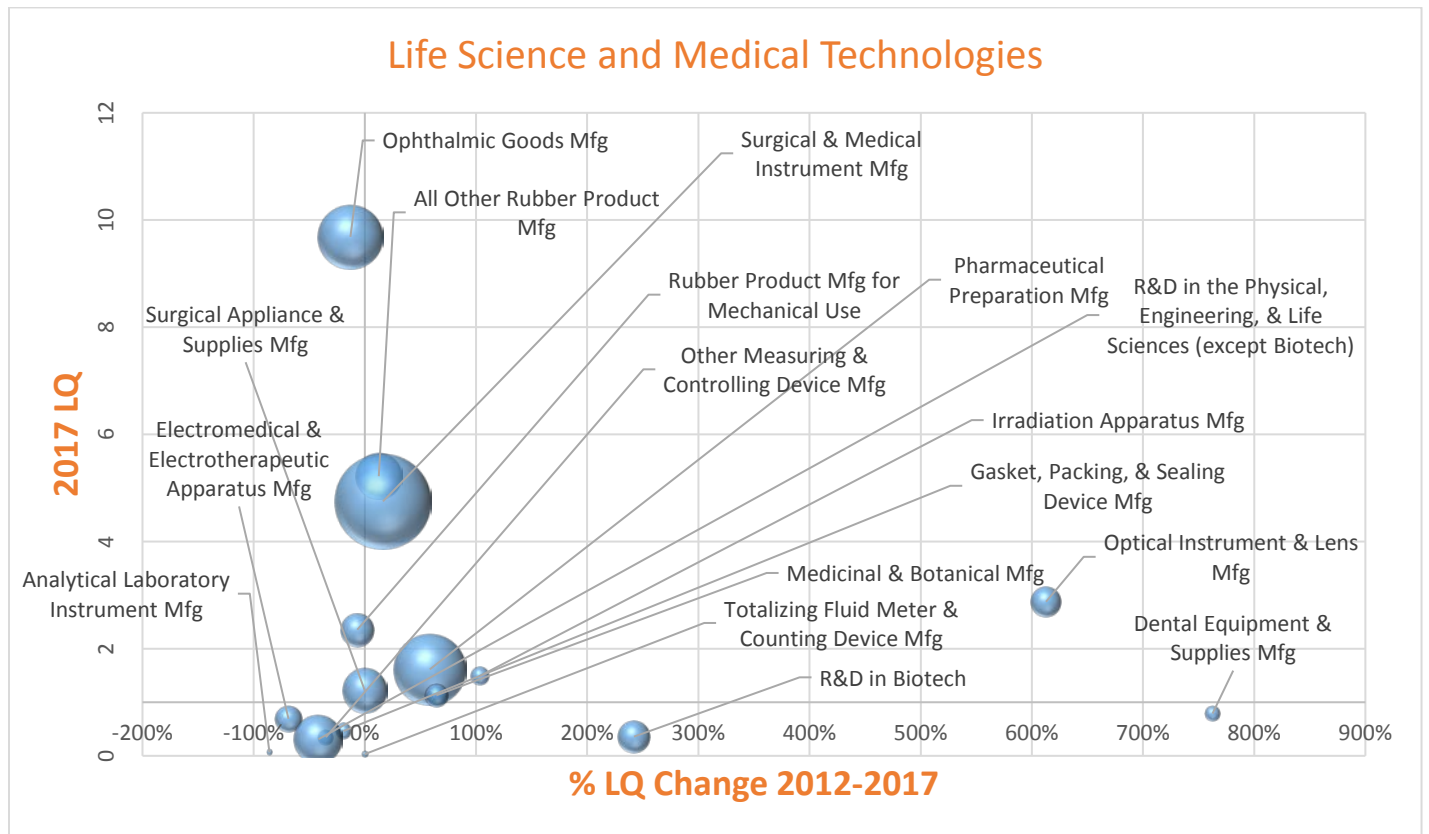
Aviation and Aerospace

Business Services

Financial Services.

Life Science and Medical Technologies

NAICS Code	Description	2012 Jobs	2017 Jobs	2012-2017 Job Change	% Change	Avg. Earnings	2012 LQ	2017 LQ
325411	Medicinal & Botanical Manufacturing	38	91	53	139%	\$56,400	0.69	1.13
325412	Pharmaceutical Preparation Manufacturing	590	932	342	58%	\$91,374	1.02	1.61
325413	In-Vitro Diagnostic Substance Manufacturing	0	0	0	0%	\$0	0	0
325414	Biological Product (except Diagnostic) Manufacturing	0	0	0	0%	\$0	0	0
326291	Rubber Product Manufacturing for Mechanical Use	196	200	4	2%	\$72,162	2.52	2.35
326299	All Other Rubber Product Manufacturing	329	378	49	15%	\$64,043	4.64	5.22
333314	Optical Instrument & Lens Manufacturing	23	156	133	578%	\$66,734	0.4	2.87
334510	Electromedical & Electrotherapeutic Apparatus Manufacturing	359	125	-234	-65%	\$74,217	2.2	0.69
334514	Totalizing Fluid Meter & Counting Device Manufacturing	0	<10	Insf. Data	Insf. Data	Insf. Data	0	0.03
334516	Analytical Laboratory Instrument Manufacturing	45	<10	Insf. Data	Insf. Data	Insf. Data	0.49	0.07
334517	Irradiation Apparatus Manufacturing	26	57	31	119%	\$84,050	0.73	1.49
334519	Other Measuring & Controlling Device Manufacturing	53	37	-16	-30%	\$65,327	0.54	0.35
339112	Surgical & Medical Instrument Manufacturing	1,399	1,656	257	18%	\$82,942	4.08	4.75
339113	Surgical Appliance & Supplies Manufacturing	342	354	12	4%	\$81,426	1.21	1.21
339114	Dental Equipment & Supplies Manufacturing	<10	36	Insf. Data	Insf. Data	\$104,558	0.09	0.79
339115	Ophthalmic Goods Manufacturing	871	750	-121	-14%	\$89,164	11.13	9.68
339991	Gasket, Packing, & Sealing Device Manufacturing	49	41	-8	-16%	\$91,434	0.57	0.46
541711	R&D in Biotechnology	42	179	137	326%	\$97,179	0.1	0.36
541712	R&D in the Physical, Engineering, & Life Sciences	669	410	-259	-39%	\$77,990	0.53	0.31
		5,035	5,410	375	7%	\$82,453		



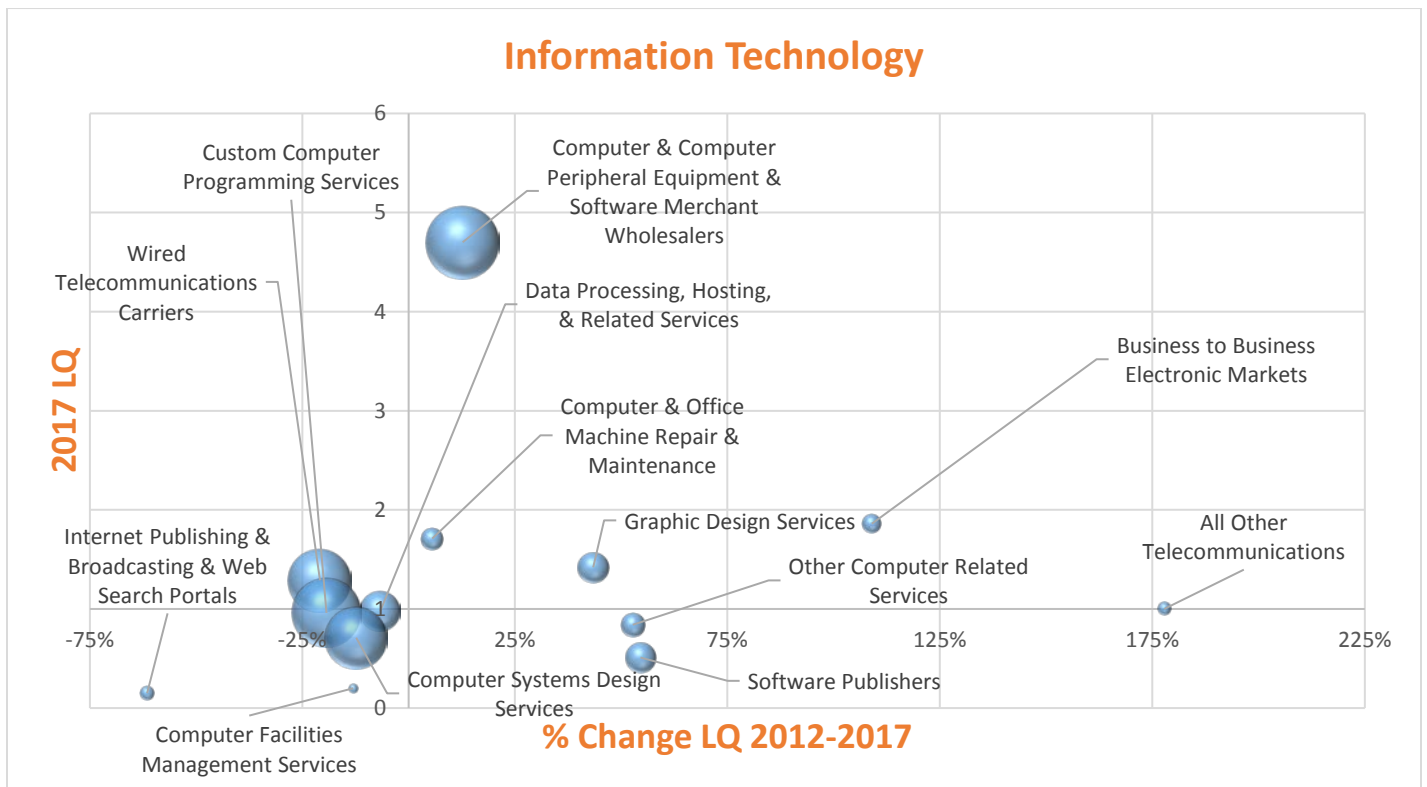
The life sciences and medical technology field is a bright spot in the Pinellas economy. Several high wage clusters have emerged that provide strong employment. The broad interpretation of the cluster chart is that medical manufacturing is strong and growing in the local economy. Ophthalmic goods in particular are extremely well positioned with a location quotient almost ten times greater than the national economy it is. Expanding research and development positions could pose a challenge in the near term. R&D in biotechnology is an emerging industry that has grown strongly

Large Employers: Life Science and Medical Technologies
ConMed Linvatec
Baxter Healthcare Manufacturing
Catalent Pharma Solutions
Bausch & Lomb
West Pharmaceutical

between 2012 and 2017, but still lags nationally in its concentration here. Competition with biotechnology research firms is fierce nationally because these are coveted high wage and high skill positions. A concerning trend is that R&D positions in other scientific fields declined during this time period. In part be because the 2017 NAICS update changed the codes used to classify research and development across the sciences.

Information Technology

NAICS Code	Description	2012 Jobs	2017 Jobs	2012-2017 Job Change	% Change	Avg. Earnings	2012 LQ	2017 LQ
423430	Computer & Computer Peripheral Equipment & Software Merchant Wholesalers	2,692	2,957	265	10%	\$101,427	4.17	4.7
425110	Business to Business Electronic Markets	99	188	89	90%	\$220,289	0.89	1.86
511210	Software Publishers	267	528	261	98%	\$86,838	0.33	0.51
517110	Wired Telecommunications Carriers	2,668	2,164	-504	-19%	\$85,245	1.63	1.29
517919	All Other Telecommunications	26	87	61	235%	\$101,127	0.36	1
518210	Data Processing, Hosting, & Related Services	764	871	107	14%	\$100,552	1.05	0.98
519130	Internet Publishing & Broadcasting & Web Search Portals	141	95	-46	-33%	\$68,113	0.39	0.15
541430	Graphic Design Services	356	544	188	53%	\$37,767	0.99	1.42
541511	Custom Computer Programming Services	2,584	2,614	30	1%	\$87,733	1.19	0.96
541512	Computer Systems Design Services	1,852	2,098	246	13%	\$86,128	0.81	0.71
541513	Computer Facilities Management Services	39	42	3	8%	\$87,172	0.23	0.2
541519	Other Computer Related Services	184	297	113	61%	\$97,956	0.55	0.84
811212	Computer & Office Machine Repair & Maintenance	256	265	9	4%	\$89,810	1.62	1.71
		11,928	12,749	821	7%	\$90,937		



Information technology (IT) is an interesting field because the constituent industries have much variation within them. Pinellas County is very strong in the wholesale trade aspect of IT as computer hardware/software vendors sustained strong growth. Software development has generally done well in the area also as software publishers are an emerging industry. In an odd twist however, custom computer programming gained employment during this period at a much slower rate. Computer systems design services along with data processing fall in this same category and also are growing, but at a slow rate.

Large Employers: Information Technology
Compulink
SCC Soft Computer
Tech Data Corp
Vology
Verifone

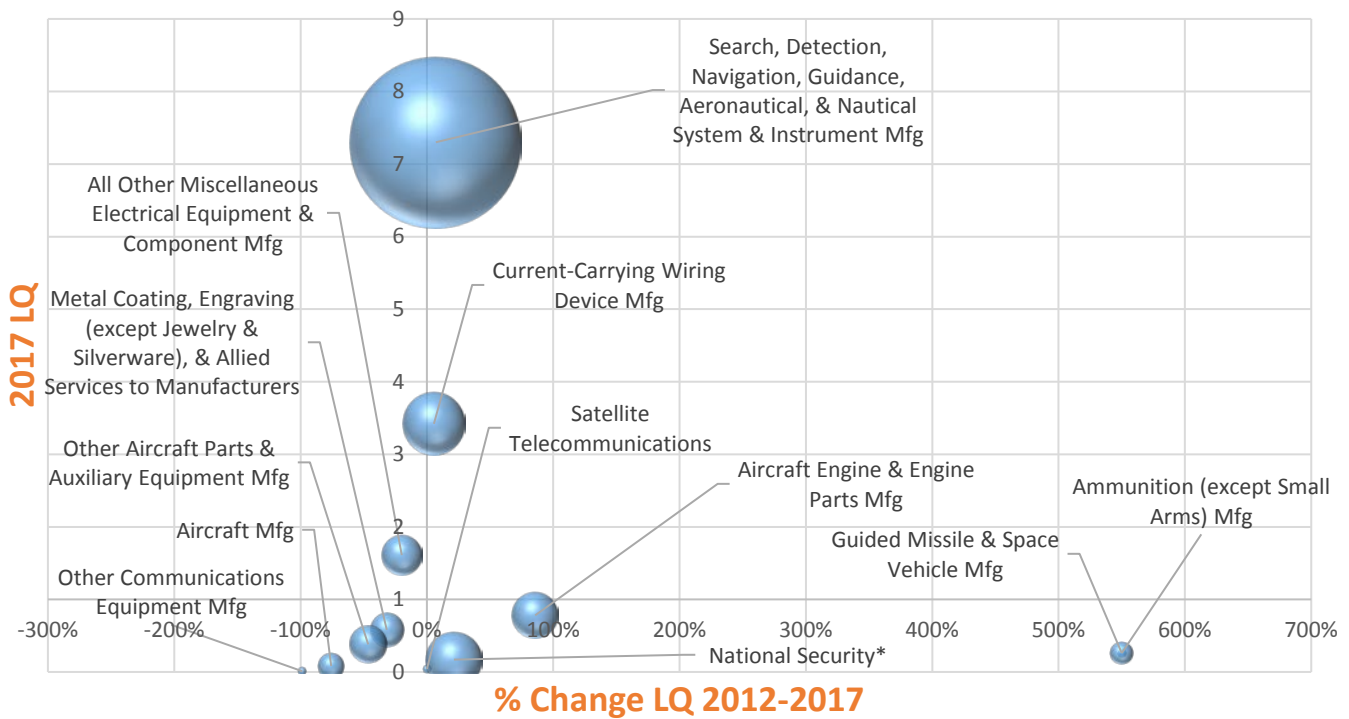
Graphic design saw some of the fastest growth from 2012-2017. While employment gains are always appreciated this sector has some concerns. It is the lowest paying category in the IT designation and the BLS predicts that it will grow rather slowly over the near term (Statistics). Wired telecommunication carriers are also a cause for concern because they lost employees and the location quotient decreased over the period. Potentially this could be because of secular trends in the communications industry. The decline of landline telephone use and cable television subscriptions could pose a problem for these companies as their revenues decrease.

Defense and Aviation and Aerospace

NAICS Code	Description	2012 Jobs	2017 Jobs	2012-2017	% Change	Avg. Earnings	2012 LQ	2017 LQ
332812	Metal Coating, Engraving (except Jewelry & Silverware), & Allied Services to Manufacturers	131	97	-34	-26%	\$ 54,341	0.85	0.58
332993	Ammunition (except Small Arms) Manufacturing	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.04	0.26
334290	Other Communications Equipment Manufacturing	48	<10	Insf. Data	Insf. Data	Insf. Data	0.77	0.01
334511	Search, Detection, Navigation, Guidance, Aeronautical, & Nautical System & Instrument Manufacturing	2573	2457	-116	-5%	\$ 108,186	6.82	7.3
335931	Current-Carrying Wiring Device Manufacturing	299	324	25	8%	\$ 68,062	3.24	3.42
335999	All Other Miscellaneous Electrical Equipment & Component Manufacturing	163	137	-26	-16%	\$ 66,153	2.01	1.61
336411	Aircraft Manufacturing	220	56	-164	-75%	\$ 75,665	0.33	0.08
336412	Aircraft Engine & Engine Parts Manufacturing	94	175	81	86%	\$ 73,817	0.42	0.78
336413	Other Aircraft Parts & Auxiliary Equipment Manufacturing	210	118	-92	-44%	\$ 77,427	0.71	0.38
336414	Guided Missile & Space Vehicle Manufacturing	<10	42	Insf. Data	Insf. Data	\$ 126,537	0.04	0.26
336992	Military Armored Vehicle, Tank, & Tank Component Manufacturing	0	0	0	0%	\$ -	0	0
517410	Satellite Telecommunications	0	<10	Insf. Data	Insf. Data	Insf. Data	0	0.04
928110	National Security*	225	261	36	16%	\$ 78,428	0.14	0.17
		3963	3667	-290	-7%	\$ 96,612		

*National security is not reported by EMSI, 2012-2016 annual BLS figures used instead

Defense/Homeland Security & Aviation/Aerospace



The defense and homeland security industries have been combined with the aviation and aerospace industries for two reasons. The first is because they are somewhat similar industries that both often rely on federal funding. The second is because there are relatively few specific NAICS codes that make up this industry list when compared with others. The overall decline in jobs this sector faced may be related to the federal government's sequester that cut military spending. That could also explain how two industries, ammunition and search, detection, etc instrument manufacturing had increases in their location quotients even though ammunition had no significant change in employment and search, detection, etc instruments declined in employment over that time period.

Large Employers - Defense/Homeland Security and Aviation/Aerospace
Honeywell Aerospace
Raytheon
Lockheed Martin
GE Aviation Systems

An interesting divergence is that aircraft engine manufacturing did well from 2012 to 2017, but that other the related industries of aircraft manufacturing and aircraft parts declined. This potentially could be because firms reclassified their work, but this trend deserves further investigation because these three industries, in theory, should be complementary to each other. Guided missile and space vehicle manufacturing increased also increased and these components may have been changed from aircraft parts.

A bright spot in these industries however is the emerging national security industry. Unfortunately, EMSI does not track this employment information as their methods only cover private sector employment. The Bureau of Labor Statistics in their QCEW information does have relevant information through 2016. This employment growth possibly has something to do with military recruiting stations and training facilities located in the area.

Business Services

NAICS Code	Description	2012 Jobs	2017 Jobs	Job Growth	% Growth	Average Earr	2012 LQ	2017 LQ
541214	Payroll Services	586	1,908	1,322	226%	\$118,294	1.23	3.81
551111	Offices of Bank Holding Companies	38	17	-21	-55%	\$149,154	0.85	0.45
551112	Offices of Other Holding Companies	269	308	39	14%	\$186,104	1.42	1.45
551114	Corporate, Subsidiary, & Regional Managing Offices	10,025	14,494	4,469	45%	\$92,685	1.85	2.33
561110	Office Administrative Services	1,453	1,375	-78	-5%	\$65,222	1.16	0.92
561422	Telemarketing Bureaus & Other Contact Centers	2,996	5,025	2,029	68%	\$32,853	2.54	3.39
		15367	23127	7760	50%	\$ 81,450		



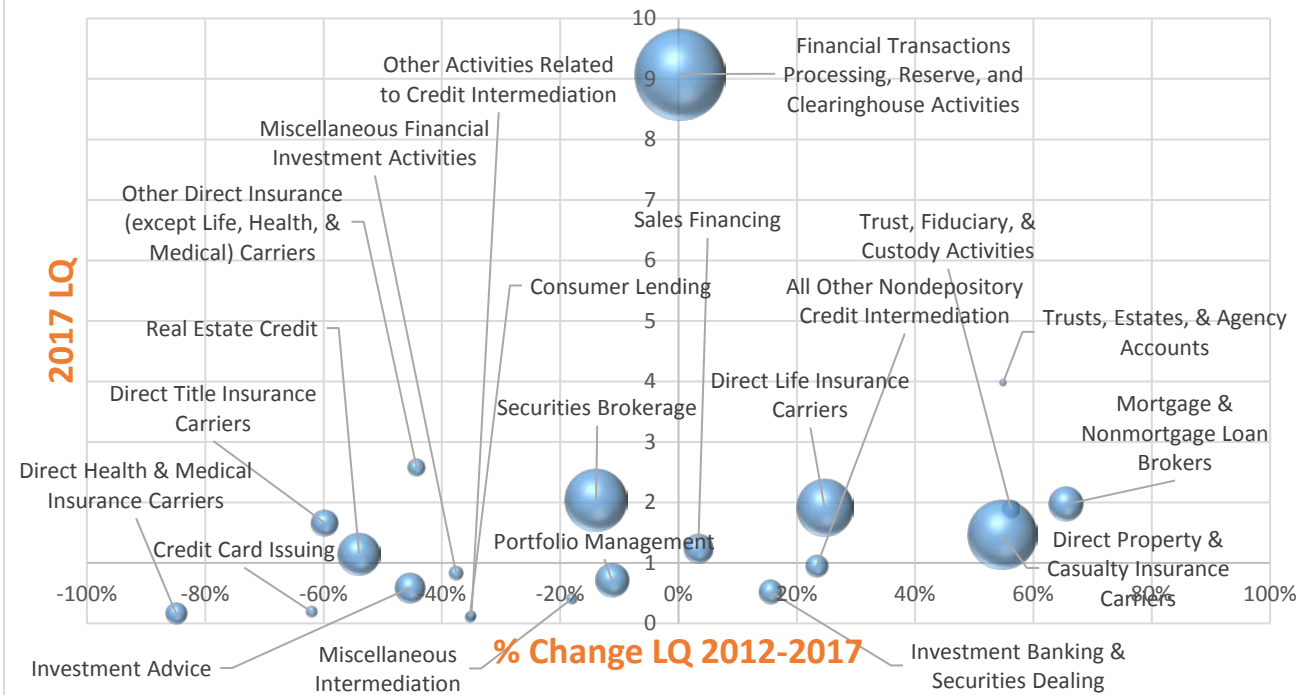
Business services has proven to be one of the strongest employment groups in Pinellas. Over a 5 year period, the number of business services jobs increased by 50%. Almost 4,500 Corporate, Subsidiary, and Regional Managing office jobs were added between 2012 and 2017 along with over 1,300 Payroll Services jobs. This growth strongly increased the county's location quotient when considering the highly valued Management NAICS sector. The high wage payroll services sector also experience strong growth as did telemarketing bureaus.

Large Employers - Business Services
Macys Credit & Customer Services
HCA Patient Account Service
Catalina Marketing Corp
Paychex

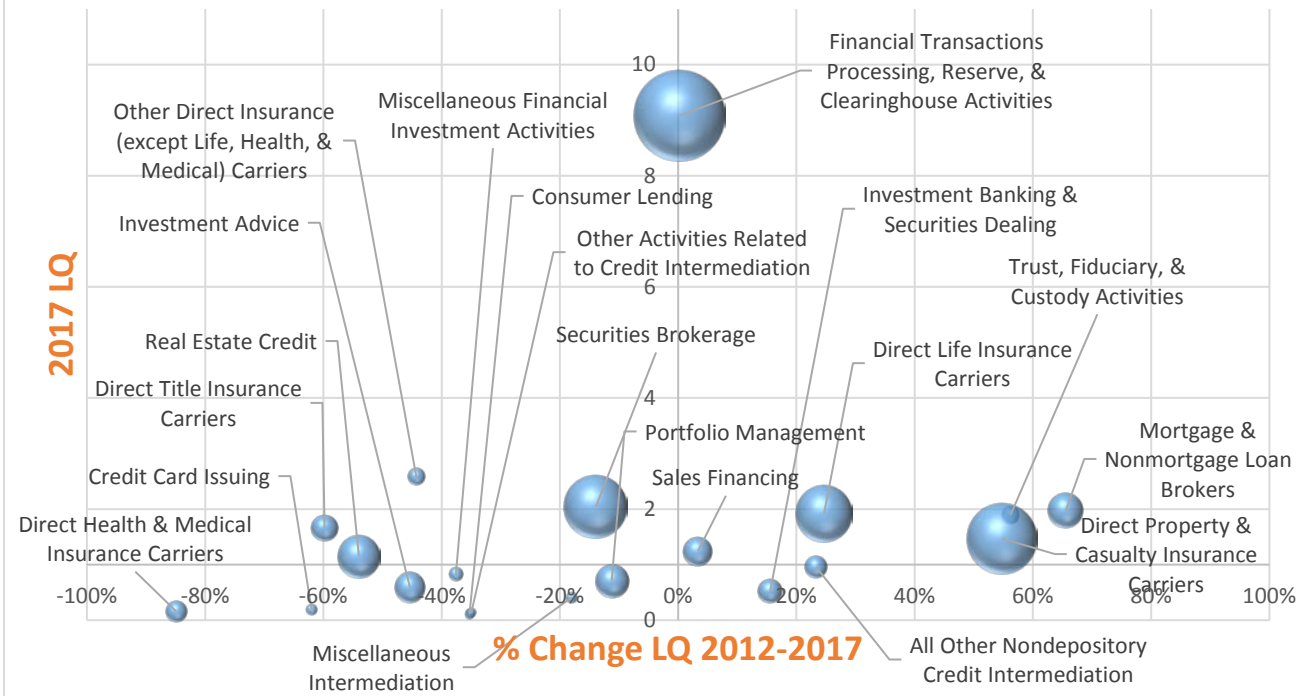
Financial Services

NAICS	Description	2012 Jobs	2017 Jobs	Job Growth	% Change	Avg. Earnings	2012 LQ	2017 LQ
521110	Monetary Authorities-Central Bank	0	0	0	0%	\$ -	0	0
522210	Credit Card Issuing	153	46	-107	-70%	\$ 68,976	0.5	0.19
522220	Sales Financing	274	343	69	25%	\$ 69,769	1.2	1.24
522291	Consumer Lending	46	34	-12	-26%	\$ 67,773	0.17	0.11
522292	Real Estate Credit	1487	753	-734	-49%	\$ 104,643	2.5	1.15
522293	International Trade Financing	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.09	0.12
522294	Secondary Market Financing	17	<10	Insf. Data	Insf. Data	Insf. Data	0.33	0.01
522298	All Other Nondepository Credit Intermediation	144	196	52	36%	\$ 48,107	0.77	0.95
522310	Mortgage & Nonmortgage Loan Brokers	235	497	262	111%	\$ 106,288	1.19	1.97
522320	Financial Transactions Processing, Reserve, & Clearinghouse Activities	2986	3488	502	17%	\$ 77,935	9.06	9.08
522390	Other Activities Related to Credit Intermediation	52	32	-20	-38%	\$ 57,524	0.2	0.13
523110	Investment Banking & Securities Dealing	193	220	27	14%	\$ 266,455	0.45	0.52
523120	Securities Brokerage	1863	1658	-205	-11%	\$ 149,320	2.37	2.04
523130	Commodity Contracts Dealing	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.11	0.05
523140	Commodity Contracts Brokerage	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.07	0.18
523210	Securities & Commodity Exchanges	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.33	0.31
523910	Miscellaneous Intermediation	52	44	-8	-15%	\$ 64,054	0.5	0.41
523920	Portfolio Management	394	477	83	21%	\$ 182,177	0.8	0.71
523930	Investment Advice	531	380	-151	-28%	\$ 110,674	1.08	0.59
523991	Trust, Fiduciary, & Custody Activities	76	118	42	55%	\$ 88,573	1.21	1.89
523999	Miscellaneous Financial Investment Activities	93	77	-16	-17%	\$ 64,468	1.33	0.83
524113	Direct Life Insurance Carriers	1182	1333	151	13%	\$ 88,261	1.54	1.92
524114	Direct Health & Medical Insurance Carriers	1046	173	-873	-83%	\$ 141,667	1.06	0.16
524126	Direct Property & Casualty Insurance Carriers	1248	2043	795	64%	\$ 101,376	0.95	1.47
524127	Direct Title Insurance Carriers	664	286	-378	-57%	\$ 66,038	4.13	1.66
524128	Other Direct Insurance (except Life, Health, & Medical) Carriers	182	113	-69	-38%	\$ 82,819	4.63	2.58
525110	Pension Funds	36	<10	Insf. Data	Insf. Data	Insf. Data	0.76	0.73
525120	Health & Welfare Funds	0	0	0	0%	\$ -	0	0
525190	Other Insurance Funds	14	0	-14	-100%	\$ -	0.25	0
525920	Trusts, Estates, & Agency Accounts	67	17	-50	-75%	\$ 113,449	2.57	3.98
525990	Other Financial Vehicles	10	12	2	20%	\$ 58,440	0.42	1.48
		13,060	12,357	-703	-5%	\$103,938		

Financial Services



Financial Services (Jobs>20)



A second chart for financial services employment was added because the financial services industry group has so many members. The second chart only has the six digits industries that have more than 20 employees. As a consequence, it is somewhat cleaner and easier to read.

The targeted financial services industries together are a diverse set of firms and vary greatly in their size and growth. Overall the industries saw a slight decline in employment from 2012 to 2017, but the overall trend masks the general upheaval within the sector. For example, direct property and casualty insurance saw a gain of 795 jobs (+64%) while direct health and medical insurance carriers saw a decline of 873 jobs (-83%). Oddly enough there seems to be a divergence in that real estate credit jobs declined even though the number of mortgage brokers and nonmortgage loans brokers, along with the two digit real estate industry, increased substantially.

Large Employers - Financial Services
Raymond James
Fidelity Information Services
Ceridian Benefits Services
Franklin Templeton Investments
PSCU