

Research Examples Using QWI Explorer

Local Employment Dynamics

Use QWI Explorer for the following analyses: <http://qwiexplorer.ces.census.gov/>.

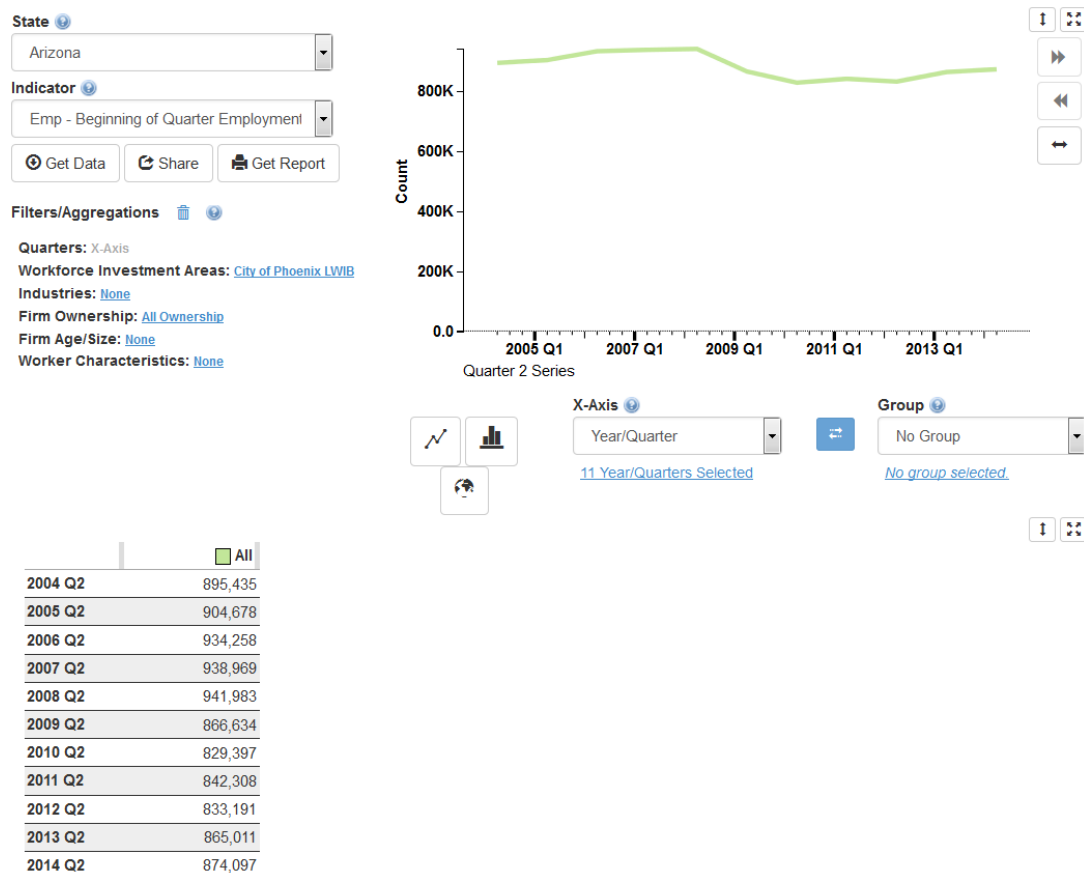
Research Question 1: General Look at the Workforce in the City of Phoenix LWIB

How has Phoenix's employment changed over the last 10 years? In particular, are the trends of all workers reflected when the data is broken out by worker demographics? What industries have the highest average monthly earnings? What about highest earnings for new hires?

In QWI Explorer, follow these steps:

- Set **State** to **Arizona**
- Set **Indicator** to **Emp** (Beginning-of-Quarter Employment)
- Change **X-Axis** to **Year/Quarter**
 - Click "20 Year/Quarters Selected" under the X-Axis dropdown, and check only the boxes for Quarter 2.
- Change **Group** to **No Group**
- Under **Filters**:
 - **Sub-State Geography** – click the blue text, change the dropdown to WIAs, and check the box for **04004025 City of Phoenix LWIB**

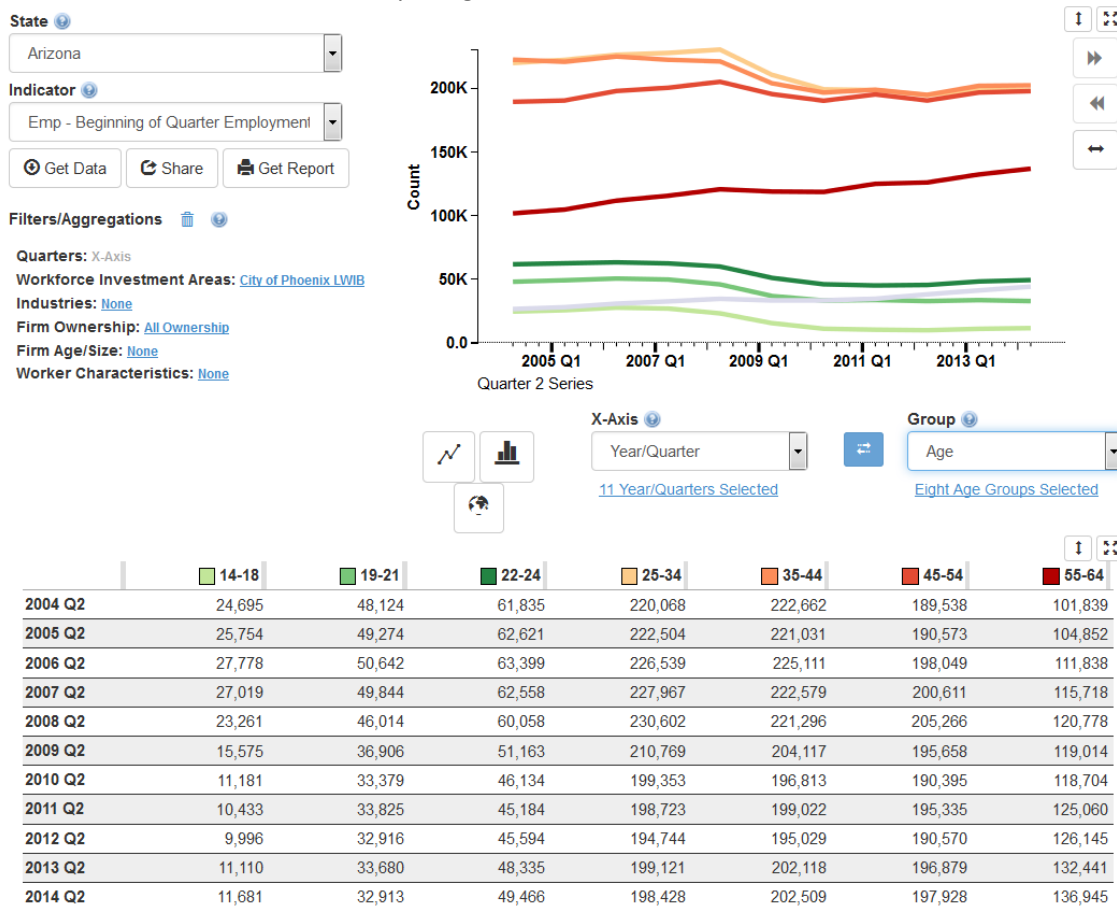
The screen should look similar to this:



Employment increased to a high point around 2008, but the Great Recession created a valley in 2010. Since then, employment has slowly increased.

- Change **Group** to **Sex, Worker Age, Education, Race,** and then **Ethnicity**

Screen should look like this when Group is Age:



Sex: Female workers appeared to be closing the Employment gap prior to the Great Recession, and did not appear to be hit quite as hard between 2008 and 2010.

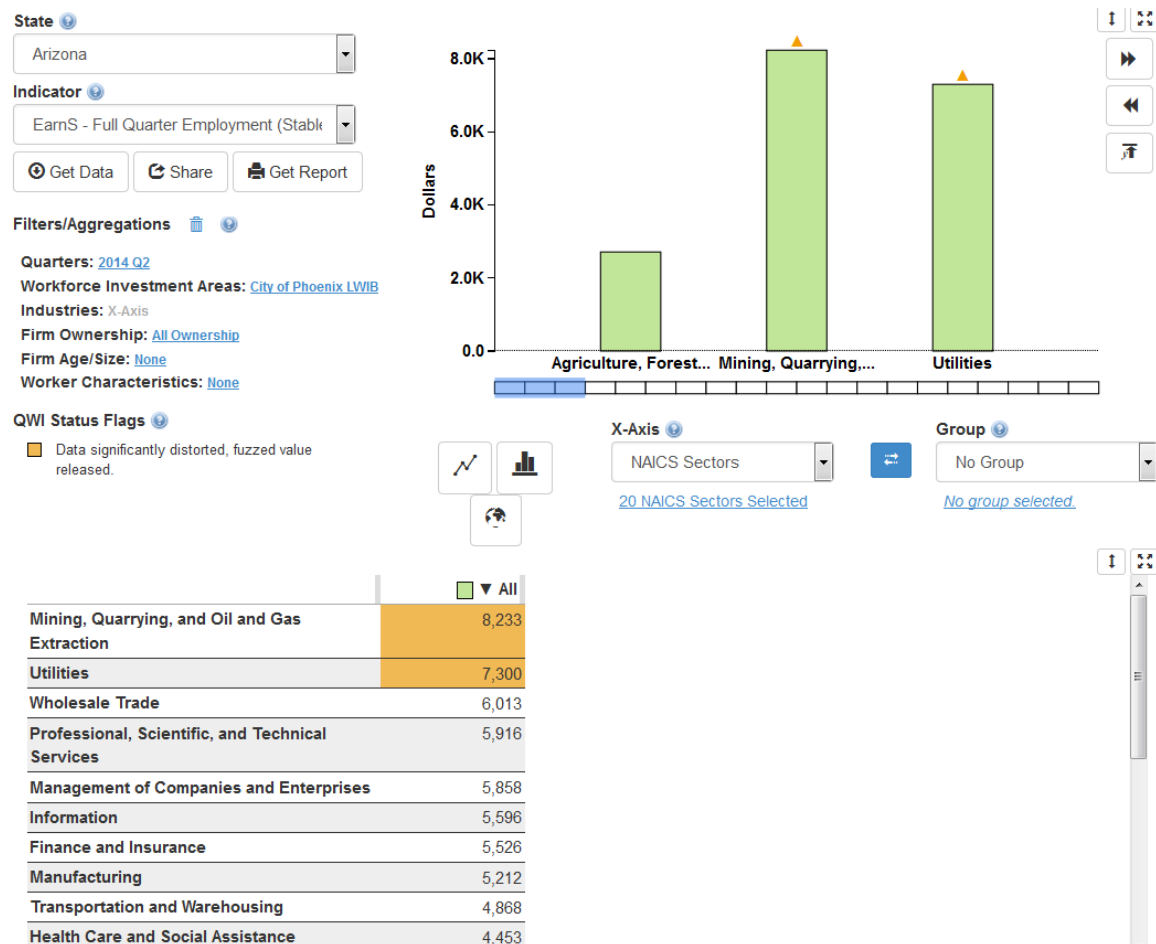
Age: Young and middle aged workers had similar patterns of Employment related to the Great Recession, yet workers in the 55-99 age range weathered the recession better, with significantly lower rates of job loss between 2008 and 2010.

Education: Young workers (with indeterminable educational attainment) were hit hardest and have not seemed to recover since 2008.

Race and Ethnicity: No new trends

- Set **Indicator** to **EarnS** (Stable Average Monthly Earnings) then **EarnHirNS** (New Hires Average Monthly Earnings)
- Change **X-Axis** to **NAICS Sector**
- Change **Group** to **No Group**

Screen should look like this:



Click the “All” column twice to sort descending. You can see that **Mining, Quarrying, and Oil/Gas Extraction** and **Utilities** have the highest stable earnings and earnings for new hires.

Research Question 2: What is the Age of Workers at Startup Firms in Montgomery County, MD?

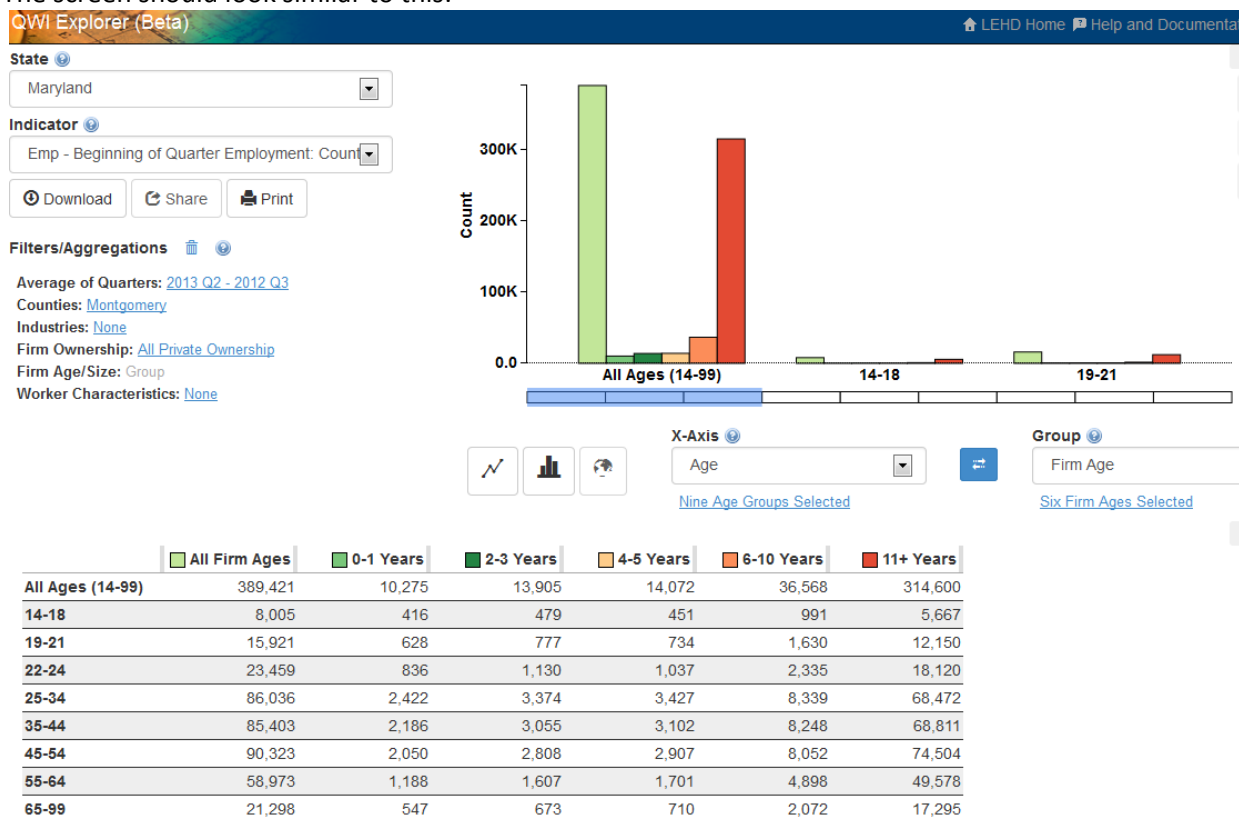
What is the age distribution of workers in startup firms? In particular, does the composition of the workforce at startups differ from the workforce at other firms? To answer this, we can compare the distribution of various worker characteristics at startups with the distribution at all firms.

In QWI Explorer, follow these steps:

- Set **State** to **Maryland**
- Set **Indicator** to **Emp** (Beginning-of-Quarter Employment)
- Change **X-Axis** to **Worker Age**
 - Click “Continue” on the conflict box (moving Worker Age from Group to X-Axis)
 - Click the blue text under the X-Axis dropdown, which reads “Eight Age Groups Selected,” and check the box for “All Ages” (so that all boxes are checked)
- Change **Group** to **Firm Age**
 - Click “continue” on the conflict box (this will change ownership to **Private**)
 - Click “close” on the “No Data Available” box (firm age is not available for the most recent quarter. We’ll resolve this by choosing the filter)

- Click the blue text under the Group dropdown, which reads “Five Firm Ages Selected”, and check the box for “All Firm Ages” (so that all boxes are checked)
- Under **Filters:**
 - **Quarters** – click the blue text, and select the 4 most recent quarters (Note: the screenshots below use 2012Q3, 2012Q4, 2013Q1 & 2013Q2 but more recent data is available). This will generate the average employment over these 4 quarters.
 - **Sub-State Geography** – click the blue text, change the dropdown to County, and check the box for **Montgomery County**

The screen should look similar to this:



From looking at the table, the age distribution at startups differs slightly from all firms – the largest Worker Age category for 0-1 Years is 25-34, while the largest category for All Firm Ages is 45-54.

Let’s calculate the percentage of workers that are under age 35, by firm age. Click the Download button, and select “Download Table as XLSX.” Open the Excel file.

In a new row, add together employment for ages 14-18, 19-21, 22-24, and 25-34 (should be rows 3-6). Do this for the “All Firm Ages” and “0-1 Years” columns.

In the next row, divide this total by the “All Ages” Row. This gives us the share of workers that are age 14-34 in All Firms and in Startup Firms.

The spreadsheet should look similar to this:

	All Firm Ages	All Firm Ages Flags	0-1 Years	0-1 Years Flags	2-3 Years	2-3 Years Flags	4-5 Years	4-5 Years Flags	6-10 Years	6-10 Years Flags	11+ Years	11+ Years Flags
All Ages (14-99)	389421	10	10275	10	13905	10	14072	10	36568	10	314600	10
14-18	8005	10	416	10	479	10	451	10	991	10	5667	10
19-21	15921	10	628	10	777	10	734	10	1630	10	12150	10
22-24	23459	10	836	10	1130	10	1037	10	2335	10	18120	10
25-34	86036	10	2422	10	3374	10	3427	10	8339	10	68472	10
35-44	85403	10	2186	10	3055	10	3102	10	8248	10	68811	10
45-54	90323	10	2050	10	2808	10	2907	10	8052	10	74504	10
55-64	58973	10	1188	10	1607	10	1701	10	4898	10	49578	10
65-99	21298	10	547	10	673	10	710	10	2072	10	17295	10
Sum 14-34	133421		4302									
Share 14-34	34%		42%									

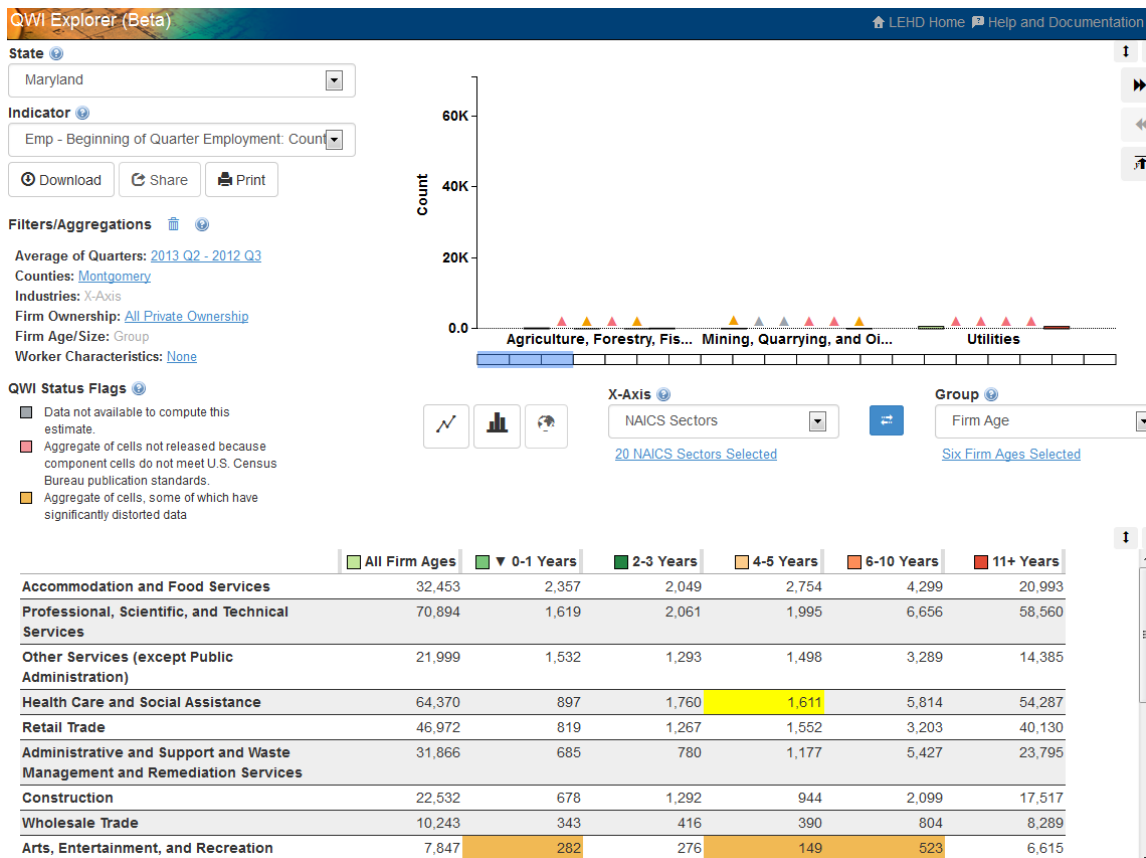
This table suggests that startup firms disproportionately employ younger workers: 42% of workers at startups are under age 35, compared to only 34% at all firms.

Research Question 3: Startup Employment, Hires and Wages by Industry, in Montgomery County, MD.

Let's study startup employment in 2-digit NAICS Sectors in Montgomery County. We'll rank industries by total employment at startups; percentage of employment at startups; and average wages at startups.

Part A: Which Sectors have the most Employment at Startups?

- Set **State** to **Maryland**
- Set **Indicator** to **Emp** (Beginning-of-Quarter Employment)
- Change **X-Axis** to **NAICS Sectors**
- Change **Group** to **Firm Age**
 - Click "continue" on the conflict box (this will change ownership to **Private**)
 - Click "close" on the "No Data Available" box (firm age is not available for the most recent quarter. We'll resolve this by choosing the filter)
- Click the blue text under the Group dropdown, which reads "Five Firm Ages Selected", and check the box for "All Firm Ages"
- Under **Filters**:
 - **Quarters** – click the blue text, and select the 4 most recent quarters (Note: the screenshots below use 2012Q3, 2012Q4, 2013Q1 & 2013Q2 but more recent data is available). This will generate the average employment over these 4 quarters.
 - **Sub-State Geography** – click the blue text, change the dropdown to County, and check the box for **Montgomery County**
- Click twice on the column heading for "0-1 Years" to sort by this column



Industries with the most startup employment include: Retail Trade (in newer Quarters of data), Accommodation & Food Services; Professional Services; and Other Services.

Part B: Which Sectors have the Highest Share of Their Employment in Startups?

To answer this, we need to move this data to a spreadsheet, calculate percentages, and then sort. Keep the same Settings as in Part A. Click the Download button, and “Download Table as XLSX.” Open the Excel file.

Perform the following steps:

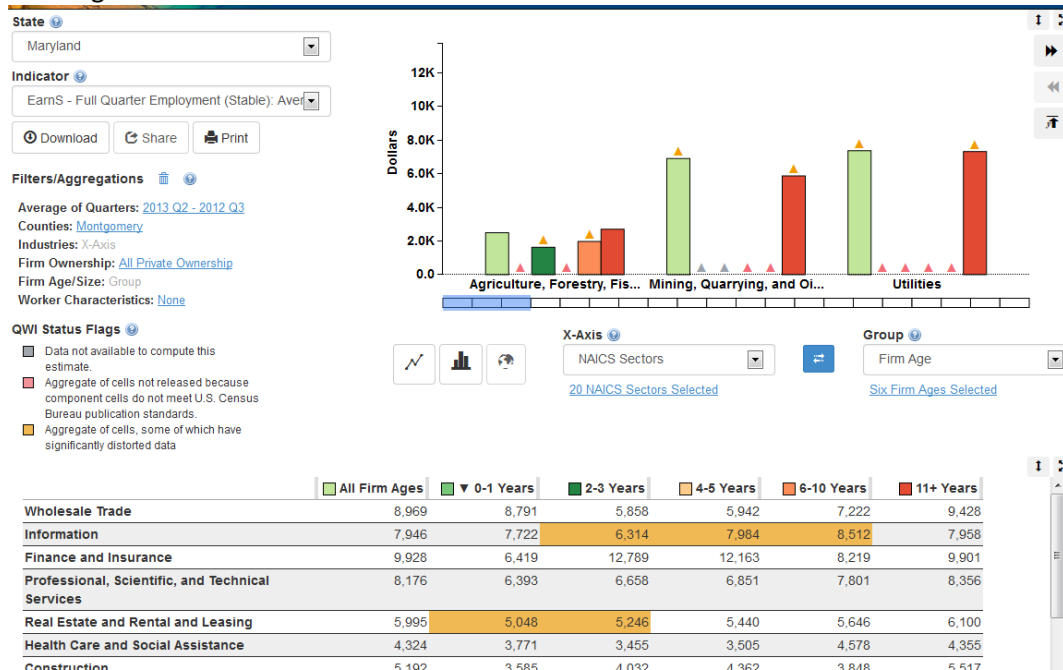
- In the next empty column, type “Share 0-1 Years” in the first row.
- In the second row, divide the value in “0-1 Years” by the value in “All Firm Ages”
- Select that cell, click and drag on the bottom right-hand corner of that cell to copy the formula
- And finally, select the “Share 0-1 Years” column, click “Sort and Filter,” and then click “Sort largest to smallest”

	All Firm Ages	All Firm Ages	0-1 Years	0-1 Years	2-3 Years	2-3 Years	4-5 Years	4-5 Years	6-10 Years	6-10 Years	11+ Years	11+ Years	Share 0-1 Years
		Flags		Flags		Flags		Flags		Flags		Flags	
Accommodation and Food Services	32453	10	2357	10	2049	10	2754	10	4299	10	20993	10	7%
Other Services (except Public Administration)	21999	10	1532	10	1293	10	1498	10	3289	10	14385	10	7%
Transportation and Warehousing	3994	10	154	10	191	10	305	12	291	10	3051	10	4%
Arts, Entertainment, and Recreation	7847	10	282	12	276	10	149	12	523	12	6615	10	4%
Wholesale Trade	10243	10	343	10	416	10	390	10	804	10	8289	10	3%
Construction	22532	10	678	10	1292	10	944	10	2099	10	17517	10	3%
Professional, Scientific, and Technical Services	70894	10	1619	10	2061	10	1995	10	6656	10	58560	10	2%
Real Estate and Rental and Leasing	11159	10	243	10	489	10	270	10	834	10	9323	10	2%
Educational Services	10186	10	219	10	382	10	434	12	585	10	8565	10	2%
Administrative and Support and Waste Management	31866	10	685	10	780	10	1177	10	5427	10	23795	10	2%
Retail Trade	46972	10	819	10	1267	10	1552	10	3203	10	40130	10	2%
Health Care and Social Assistance	64370	10	897	10	1760	10	1611	10	5814	10	54287	10	1%
Finance and Insurance	20378	10	224	10	815	10	614	10	1433	10	17291	10	1%
Manufacturing	12240	10	94	10	139	10	113	10	458	10	11434	10	1%
Information	12507	10	85	10	334	12	220	12	751	10	11115	10	1%
Agriculture, Forestry, Fishing and Hunting	250	10		11	20	12		11	25	12	189	10	0%
Mining, Quarrying, and Oil and Gas Extraction	169	12		-1		-1		11		11	137	12	0%
Utilities	693	10		11		11		11		11	663	10	0%
Management of Companies and Enterprises	8661	12		11	323	12		11	43	12	8255	12	0%
Public Administration			-1	-1		-1		-1		-1		-1	

Accommodation and Food Services and Retail Trade (in more current data) have the highest share of their employment at startups.

Part C: Which Sectors have the highest Wages at Startups?

Keep the same settings as in Part A. Change Indicator to EarnS (stable earnings). Click twice on the column heading “0-1 Years” to sort.



Wholesale Trade, Information, Finance and Insurance (especially in more current data) have the highest wages at startup firms.

Research Question 4: Does Regional Variation in Startup Concentration Predict Employment Growth? Case Study: Pennsylvania Metro Areas.

Finally, suppose we want to study the relationship between startup concentration and overall employment growth. For instance, does a large concentration of startups drive employment growth? If so, this would have interesting policy implications – perhaps localities would want to do more to attract and support startups.

To start to answer this question, let’s examine regional variation in the concentration of startup employment. Specifically, we will test whether metro areas with the highest concentration of startup employment in 2002 experienced high employment growth over the next decade.

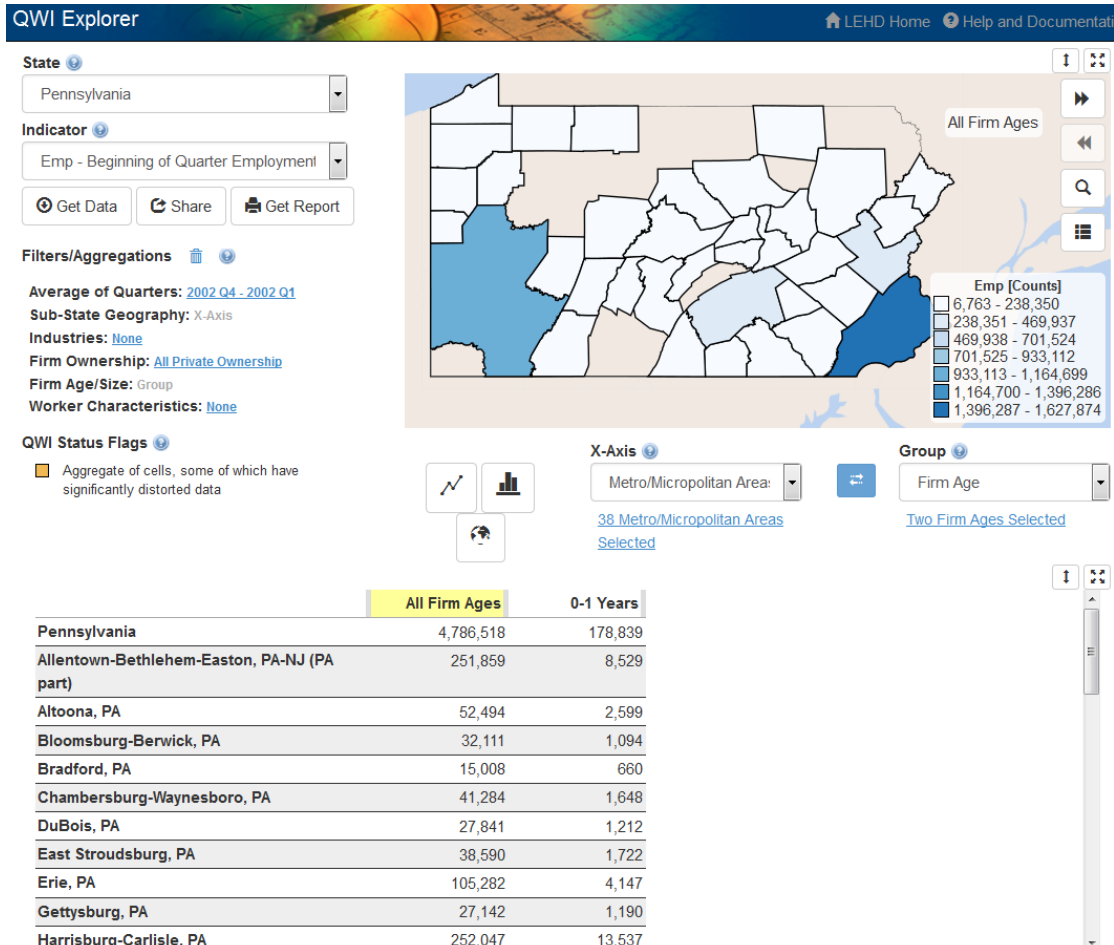
In the guided example, we’ll use Pennsylvania (feel free to choose a different state)

In QWI Explorer, follow these steps:

- Set **State** to **Pennsylvania**
- Set **Indicator** to **Emp** (Beginning-of-Quarter Employment)
- Change **X-Axis** to **Metro/Micro Areas**
 - Click the blue text under the X-Axis dropdown, which reads “38 Metro/Micro Areas Selected,” and check the box for “42 Pennsylvania” (so that all boxes are checked)
- Change **Group** to **Firm Age**
 - Click “continue” on the conflict box (this will change ownership to **Private**)

- Click “close” on the “No Data Available” box (firm age is not available for the most recent quarter. We’ll resolve this by choosing the filter)
- Click the blue text under the Group dropdown, which reads “Five Firm Ages Selected”, and check ONLY the boxes for “All Firm Ages” and “0-1 Years” (so only 2 boxes checked)
- Under **Filters:**
 - **Quarters** – click the blue text, deselect 2013Q2, and check all 4 quarters in 2002. This will generate the average employment over these 4 quarters.

Screen should look like this:



Similar to Questions 1 & 2, we want to identify the Metro Areas with the highest percentage of startups. Click the Download button, and select “Download Table as XLSX.” Open the Excel file.

Perform the following steps:

- In the next empty column, type “Share 0-1 Years” in the first row.
- In the second row, divide the value in “0-1 Years” by the value in “All Firm Ages”
- Select that cell, click and drag on the bottom right-hand corner of that cell to copy the formula
- Finally, select this “Share 0-1 Years” column, click “Sort and Filter,” and then click “Sort largest to smallest”

The resulting output should look like this:

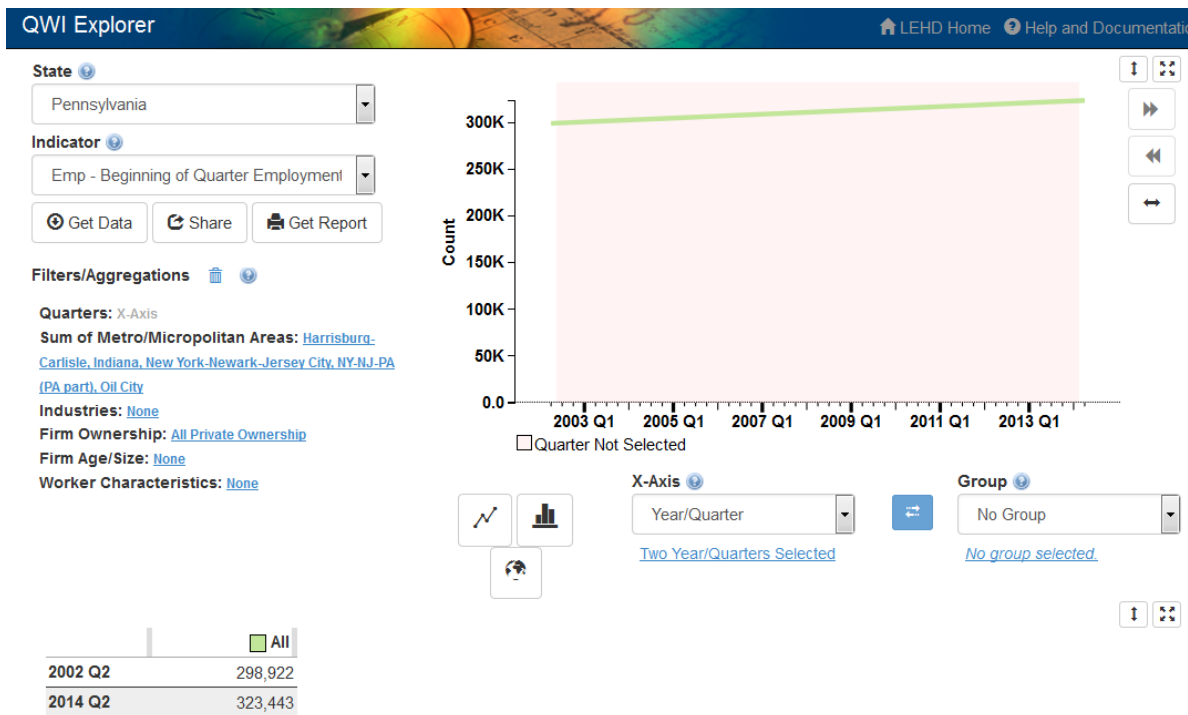
	All Firm Age	0-1 Years	Share 0-1 Years
New York-Newark-Jersey City, NY-NJ-PA (PA part)	6763	484	7.2%
Oil City, PA	17536	1112	6.3%
Indiana, PA	24211	1444	6.0%
Harrisburg-Carlisle, PA	252047	13537	5.4%
Sunbury, PA	24769	1324	5.3%
Johnstown, PA	47591	2421	5.1%
Altoona, PA	52494	2599	5.0%
Lewistown, PA	12916	627	4.9%
Selinsgrove, PA	14536	680	4.7%
Warren, PA	12749	594	4.7%
State College, PA	41610	1896	4.6%
East Stroudsburg, PA	38590	1722	4.5%
Bradford, PA	15008	660	4.4%
Gettysburg, PA	27142	1190	4.4%
DuBois, PA	27841	1212	4.4%
Somerset, PA	20719	848	4.1%
Chambersburg-Waynesboro, PA	41284	1648	4.0%
Erie, PA	105282	4147	3.9%
Scranton--Wilkes-Barre--Hazleton, PA	215834	8477	3.9%

Now, let's focus on the Metro areas with the highest share of startup employment. We'll study the 4 Metro areas ranked by share of startup employment. We want to examine how much their employment grew between 2002 and 2014, and compare this growth to the state of Pennsylvania. Here are the steps in QWI Explorer:

In QWI Explorer, follow these steps:

- Set **State** to **Pennsylvania**
- Set **Indicator** to **Emp** (Beginning-of-Quarter Employment)
- Change **X-Axis** to **Year/Quarter**
 - Click the blue text under the X-Axis dropdown, which reads "Eight Year/Quarters Selected," and check ONLY the boxes for 2002Q2 and 2014Q2.
- Change **Group** to **No Group**
- Under **Filters**:
 - **Firm Ownership** – click the blue text, and select the radio button for "All Private Ownership." We want to focus our analysis on private firms only (Since we identified startup concentration by region for only private firms, we want to examine employment growth for private firms – important to be consistent)
 - **Sub-State Geography** – click the blue text, change the dropdown menu to Metro/Micro, and select the 4 Areas that had the highest concentration of startup employment in 2002:
 - New York (PA part)
 - Oil City
 - Indiana
 - Harrisburg-Carlisle
 - This will generate the total employment for these 4 Metro Areas

So far, the screen should look like this:



Employment in these metro areas grew from 298,922 in 2002Q2 to 323,443 in 2014Q2.

To calculate the percentage growth, we can download this to a spreadsheet and divide the two rows. You would find that $(323,443 - 298,922) / 298,922 = 8.2\%$, suggesting that total employment grew by 8.2% in these regions.

How does this compare to the state of Pennsylvania as a whole? Simply remove the filters: click on the blue text next to “Sum of Metro/Micro Areas,” and click “Check None.”

Notice that employment in the state of Pennsylvania grew from 4,776,042 in 2002Q2 to 4,936,865 in 2014Q2. Calculating the percentage growth gives us $(4,936,865 - 4,776,042) / 4,776,042 = 3.4\%$. This suggests that between 2002 and 2014, employment in the metro areas with the highest concentration of startup firms grew at a rate of almost 2.5 times that of employment in the entire state (8.2% vs 3.4%)!!

Remember, correlation is not causation – we can’t say that the concentration of startups necessarily caused the higher rate of employment growth, only that a correlation exists. Still, this is an interesting result that can motivate future research.