

2016 Startup Index of Nations, Cities: (Startups Worth \$1 Billion Or More: “Unicorns”)

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Rationale

Innovation is critical for the welfare of consumers, the success of firms, and the wealth of nations. Radical innovations have led some startups and new entrants to disrupt giant incumbents, transform markets, and bring enormous wealth to individuals, firms, regions, and nations. Examples include Uber, Facebook, Amazon, and Apple. As a result, some startups have reached billion dollar valuations in short period of time and earned the title of Unicorns. Unicorn is a term used in the investment industry to indicate startups valued at \$1 billion or higher. This report presents rankings of countries and regions based on shares in terms of numbers and valuations of unicorns headquartered in those countries or regions.

Method

This study created a unique list of unicorns over the last 24 months (2014-2015). Company valuations were identified from at least two independent sources. The primary sources are CB Insights (*The Unicorn List*) and Wall Street Journal (*The Billion Dollar Startup Club*). Startups that are missing in either list were verified from other sources, such as Zephyr, SDC Platinum, and news reports. If two sources indicate different valuations for a given startup, the valuation was further verified from other sources. If the discrepancy in valuation between two sources cannot be resolved from additional sources, then the *average* of the amounts reported by two sources was used. This list was created for each month of a 24-month period ranging from January 2014 to December 2015.

Startups can drop out from the list either by going public (IPO), being acquired by another company, or dropping in valuation. Such companies appear in the list from the month they have been a unicorn, until the month on which they drop out. Because of short-term fluctuations in valuation, the study uses averages of monthly valuations to create the index. For this purpose, regions and countries are ranked on a monthly basis. The final rankings are then the average of monthly rankings.

Regions were identified on a 50-miles rule. This rule clusters cities within a 50-mile distance as belonging to one region. For example, San Francisco, San Jose, and cities between them are clustered as “Silicon Valley”; Shenzhen and Hong Kong are clustered as

a single region “Shenzhen/Hong Kong”; Anaheim and Los Angeles are grouped together under the name “Los Angeles”. Population and GDP of regions are from Wikipedia for the metropolitan areas (not for the urban or city populations). Similarly, country population and GDP values are from Wikipedia.

Findings

The main findings are as follows.

1. The study identifies 18 countries and 40 regions having at least one unicorn, for at least one month, during the two-year observation period.

2. Results reveal that the US tops the list in generating billion dollar startups with a 65% share. China (14%) comes second, and India (4%), third. 11 countries (United Kingdom 3%, Singapore 2%, Sweden 2%, Germany 2%, Canada 1.6%, South Korea 1.5%, Russia 1% and Czech Republic 1%) are listed above the threshold, having at least 1% share of all unicorns in terms of total population of unicorns. The threshold countries (having an average share of less than 1%, based on the valuation) include Israel, Australia, Netherlands, Brazil, Luxembourg, France and Taiwan. Some traditional economic powers such as Japan and Italy are absent from the ranking. Figure 1 displays the top countries ranked by the shares of unicorns, covering almost 97% of the total unicorn population over the observation period.

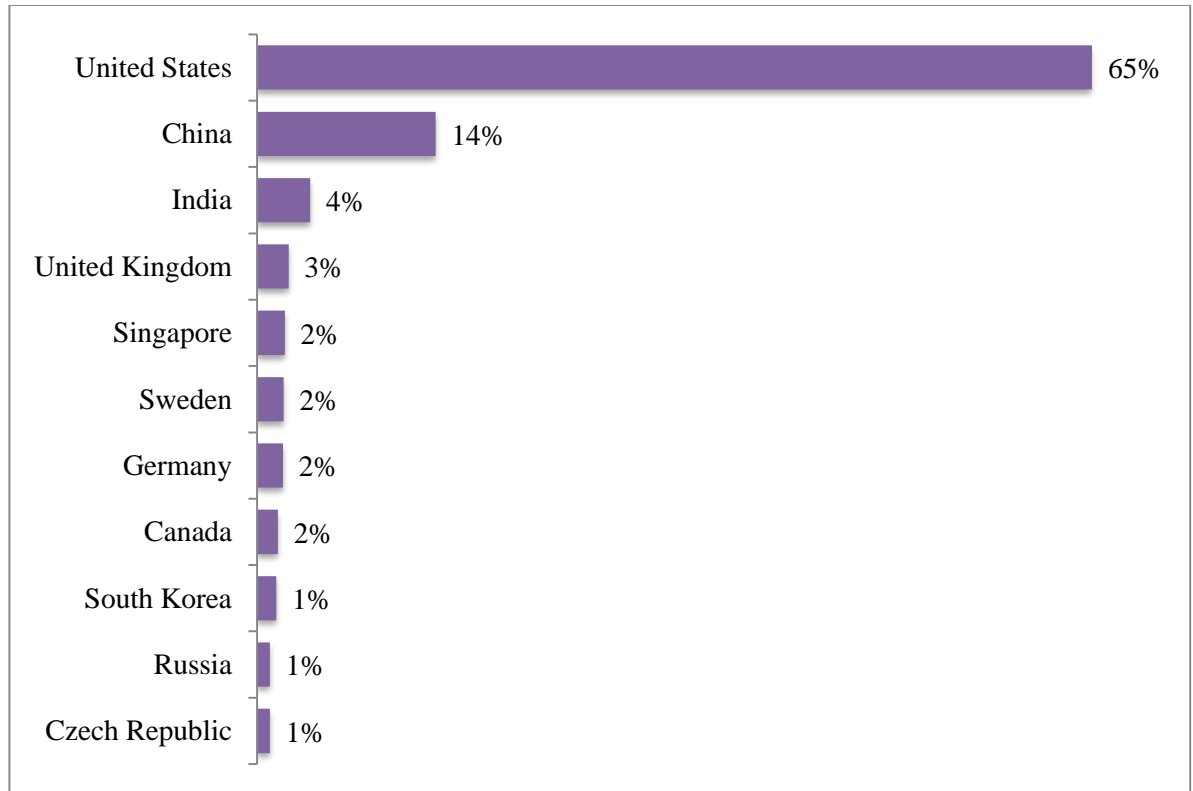


Figure 1: Top Countries Ranked by Shares of Unicorn Population

3. As shown in Figure 2, twenty-three regions have at least 1% share of the total number of unicorns and only seven of those regions are in the US. That said, US has almost five times the unicorn population of the next closest country, China. US-based unicorns are highly clustered in certain regions. Indeed, within the US, unicorns, have a cluster pattern in Silicon Valley (39% of all unicorns) followed by New York (9%), Los Angeles (5%), Boston (4%), Provo (2%), Chicago (1%) and Jacksonville (1%). Other regions in the number-based ranking are: Beijing (6%), Shanghai (3%), London (2%), Singapore (2%), Stockholm (2%), Berlin (2%), Hangzhou (2%), New Delhi (1.7%), Seoul (1.5%), Shenzhen/Hong Kong (1.4%), Mumbai (1.4%), Guangzhou (1.1%), Bangalore (1.1%), Moscow (1%) and Prague (1%).

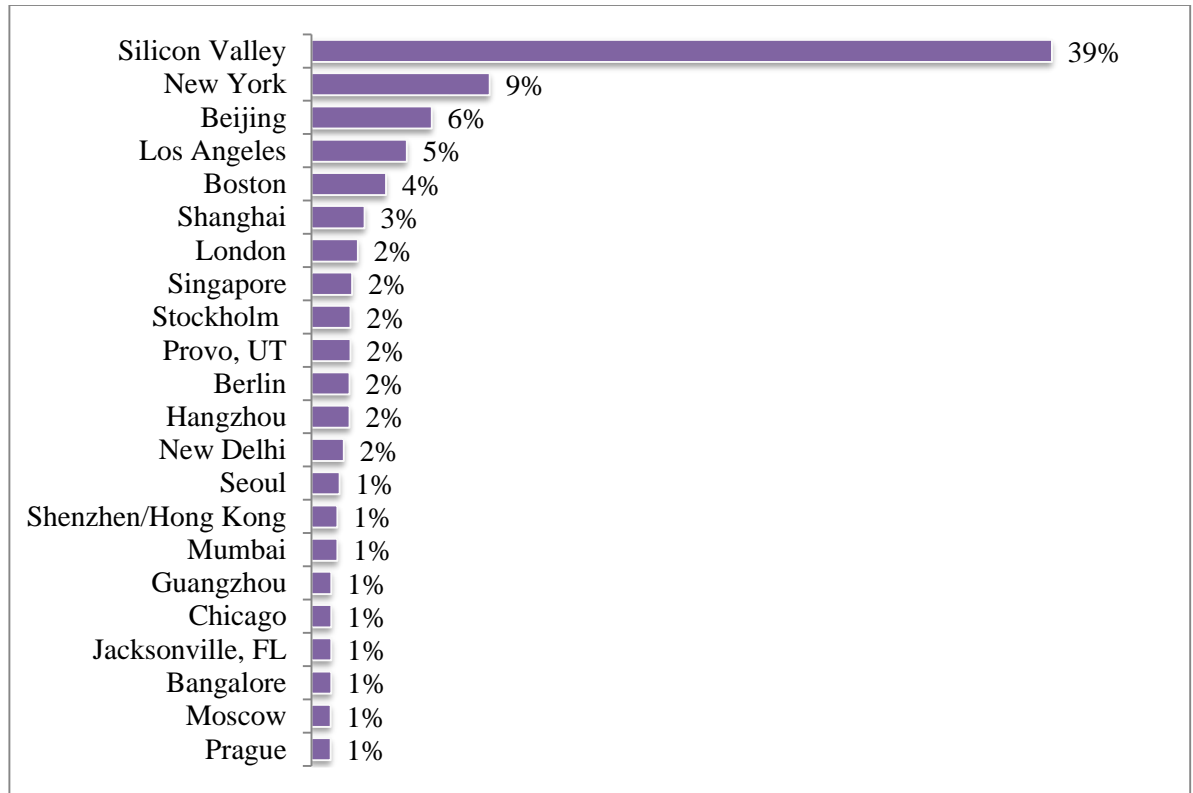


Figure 2: Top Regions Ranked by Shares of Unicorn Population

4. Seven countries in the ranking and the US and China together cover 85% of the total unicorn valuation. In particular, US again tops the list with 63% of the total valuation of unicorns. It is followed by China (22%) and India (5%). Sweden (2%) rises to the fourth place and Germany (1.5%) rise to the fifth, up from sixth and seventh in the number-based rankings, respectively. Singapore (1.2%) and United Kingdom (1.1%) complete the valuation-based rankings of unicorns. Canada, South Korea, Russia and Czech Republic drop off the rankings, appearing among the threshold countries in the valuation-based analysis.

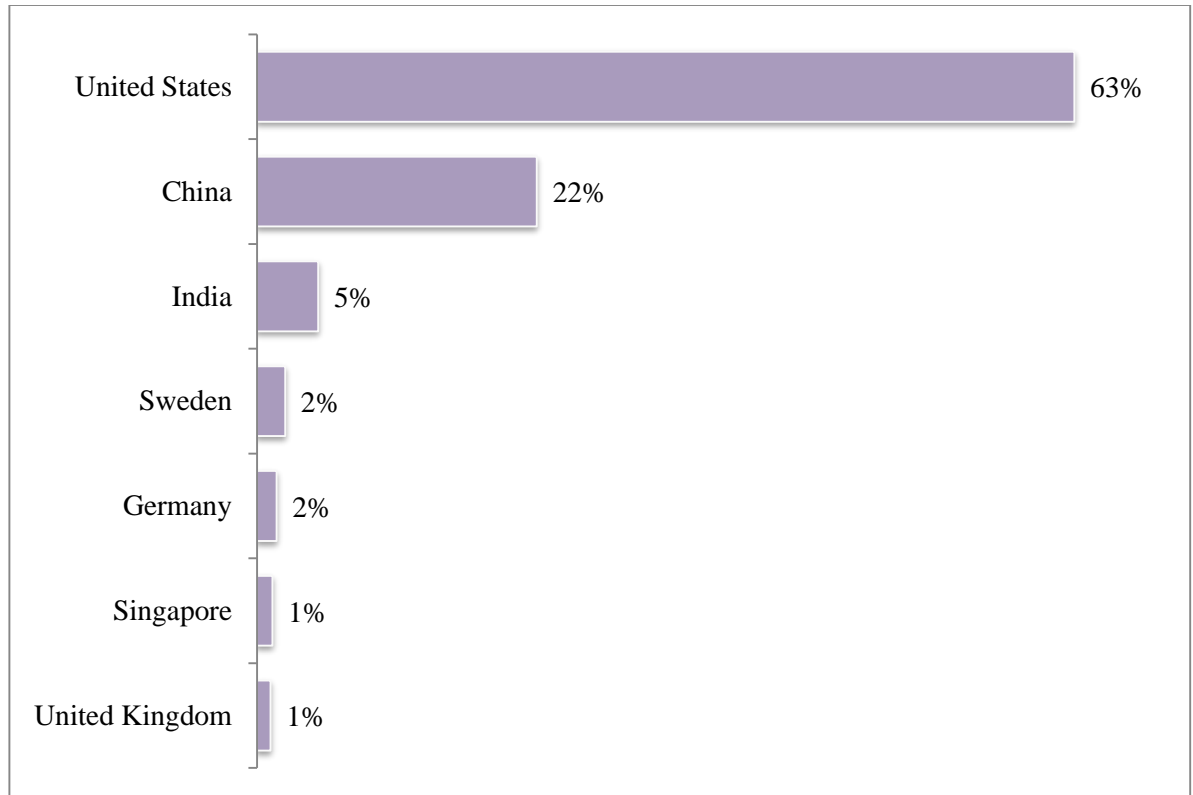


Figure 3: Top Countries Ranked by Share of Unicorn Valuation

5. Silicon Valley is at the top of the rankings with 45% of the total unicorn valuation across the globe over two years. Coming in second is Beijing (15%), followed by Los Angeles (8%), New York (5%), Bangalore (3%), Shanghai (3%), Stockholm (2%) and Boston (2%). While five of the top unicorn regions in the world are in the US, the rest of the world has several entries. Shenzhen/Hong Kong (2%), Berlin (2%), Singapore (1.2%), London (1.1%), Jacksonville (1%) and New Delhi (1%) round out the ranking. The study identifies 25 threshold regions, having smaller than 1% share in the total valuation of unicorns: Sydney, Tel Aviv, Provo, Ogden, Seoul, Vancouver, Mumbai, Ottawa, Hangzhou, Jerusalem, Moscow, Seattle, Washington, San Diego, Sao Paulo, Dania, Chongqing, Guangzhou, Paris, Chicago, Atlanta, Luxembourg, Waterloo, Prague, Taichung and Amsterdam.

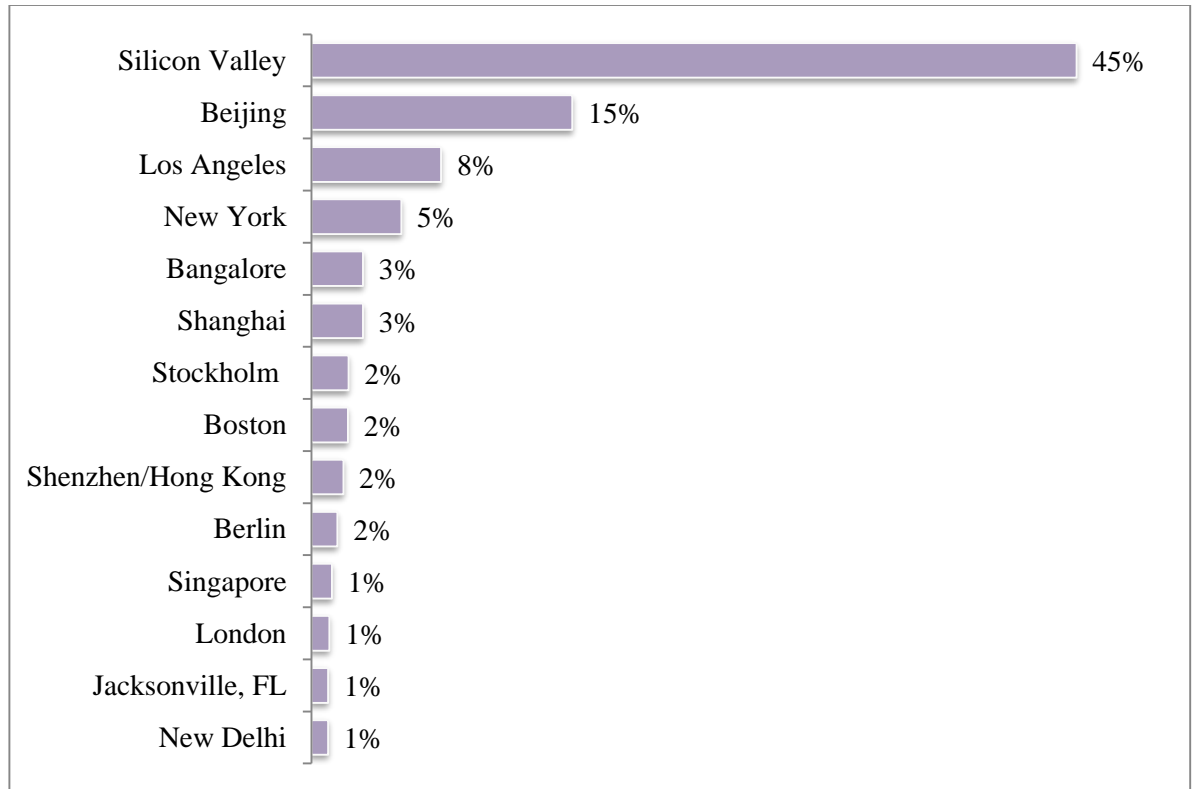


Figure 4: Top Regions Ranked by Share of Unicorn Valuation

6. Censored regression analysis indicates that, while size is important, it explains only only 24% and 12% for the index of numbers and 26% and 11% of the variance for the index of valuation, for countries and regions, respectively. Examples of small countries and regions doing well are Sweden (Stockholm), Israel, and Singapore. Besides size, economic and cultural factors may play an important role. Candidate variables in explaining the numbers as well as valuations of unicorns in a region/country might be ease of starting a new business, ease of starting a competing enterprise, openness to new ideas, and welcome to new immigrants in those regions/countries.

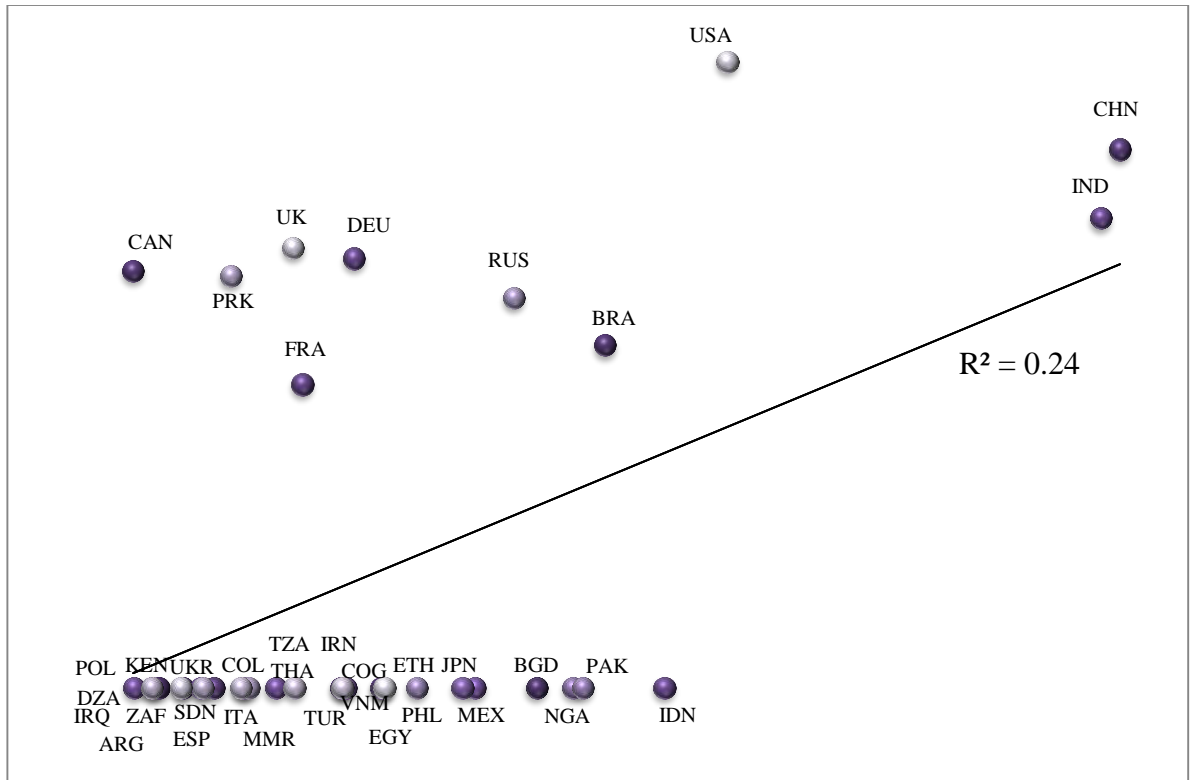


Figure 5: Large Countries Plotted by Unicorns and Population (Top 37 countries in population; x-axis: log of population; y-axis: log of total number of unicorns)

Countries	ISO Codes	Countries	ISO Codes	Countries	ISO Codes
Algeria	DZA	Iran	IRN	Singapore	SGP
Argentina	ARG	Iraq	IRQ	South Africa	ZAF
Australia	AUS	Italy	ITA	South Korea	KOR
Bangladesh	BGD	Israel	ISR	Spain	ESP
Brazil	BRA	Japan	JPN	Sudan	SDN
Canada	CAN	Kenya	KEN	Sweden	SWE
China	CHN	Luxembourg	LUX	Switzerland	CHE
Colombia	COL	Mexico	MEX	Taiwan	TWN
Congo	COD	Myanmar	MMR	Tanzania	TZA
Czech Republic	CZE	Netherlands	NLD	Thailand	THA
Egypt	EGY	Nigeria	NGA	Turkey	TUR
Ethiopia	ETH	Pakistan	PAK	Ukraine	UKR
France	FRA	Philippines	PHL	United Kingdom	GBR
Germany	DEU	Poland	POL	United States	USA
India	IND	Russia	RUS	Vietnam	VNM
Indonesia	IDN	Saudi Arabia	SAU		

Table 1: Country Codes

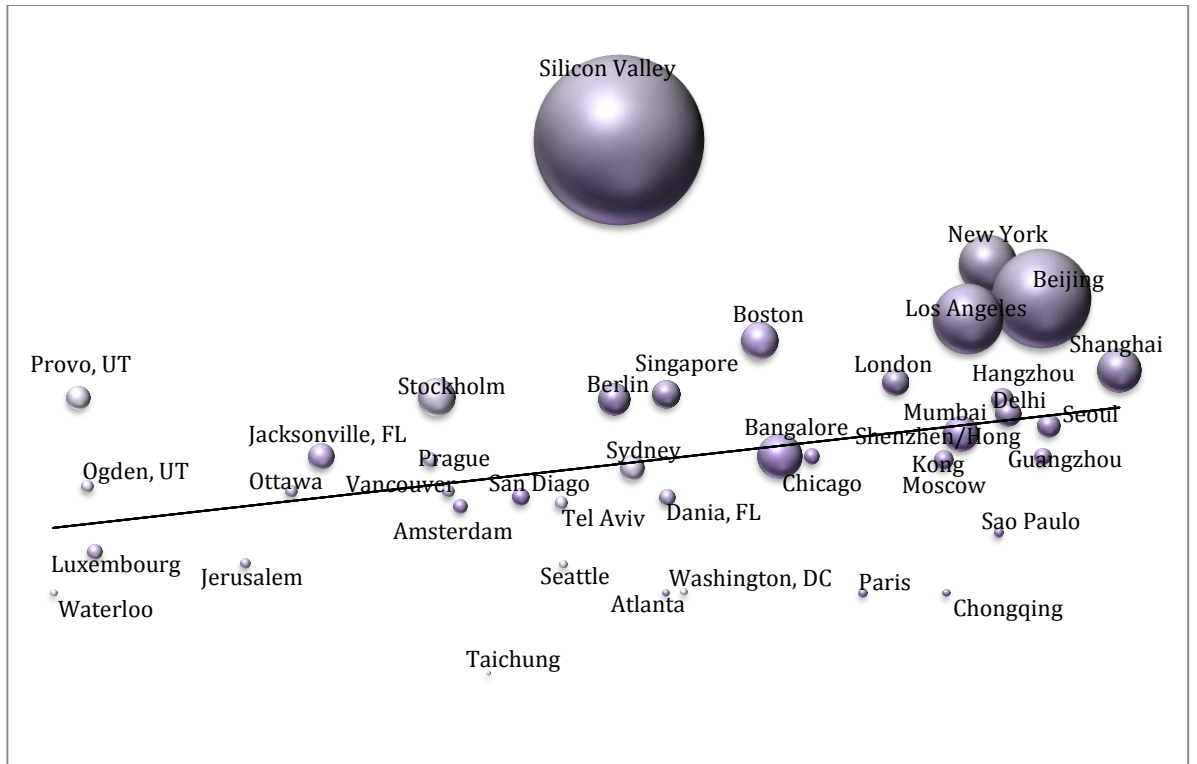


Figure 6: Regions Plotted by Unicorns and Population (Regions with at least one unicorn; x-axis: log of population; y-axis: log of total number of unicorns; bubble sizes: total valuation of unicorns)

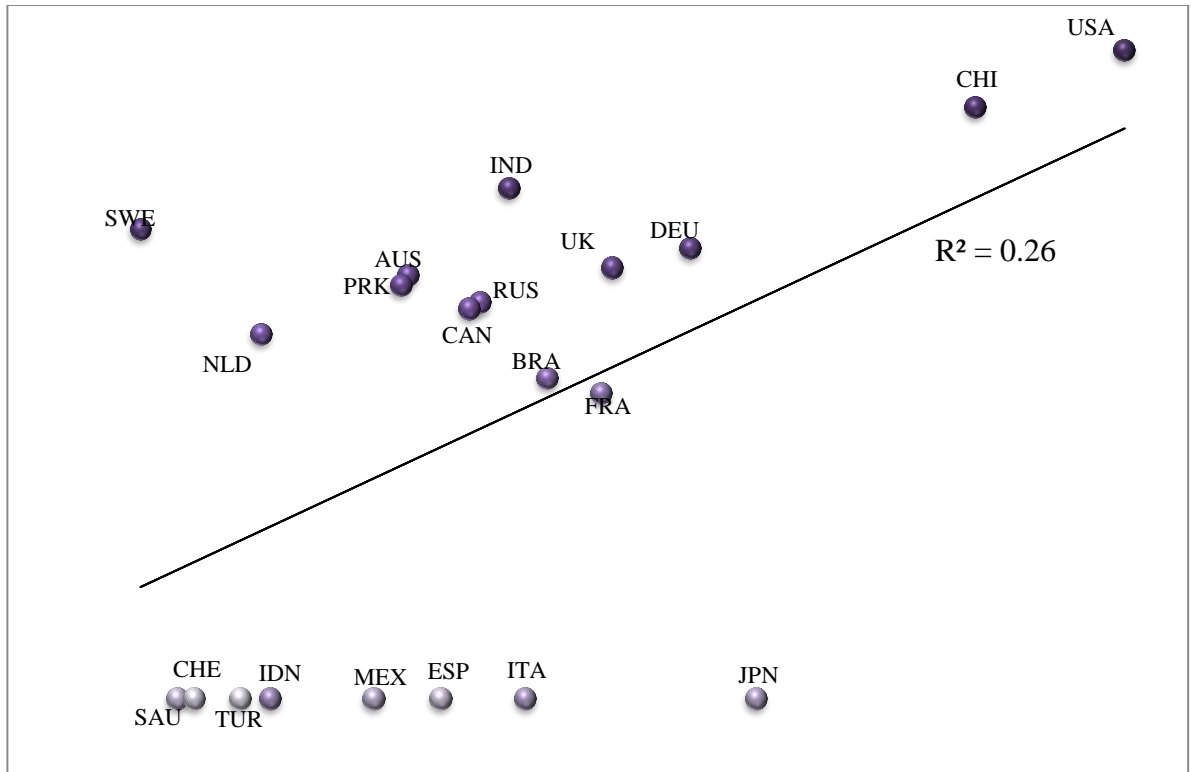
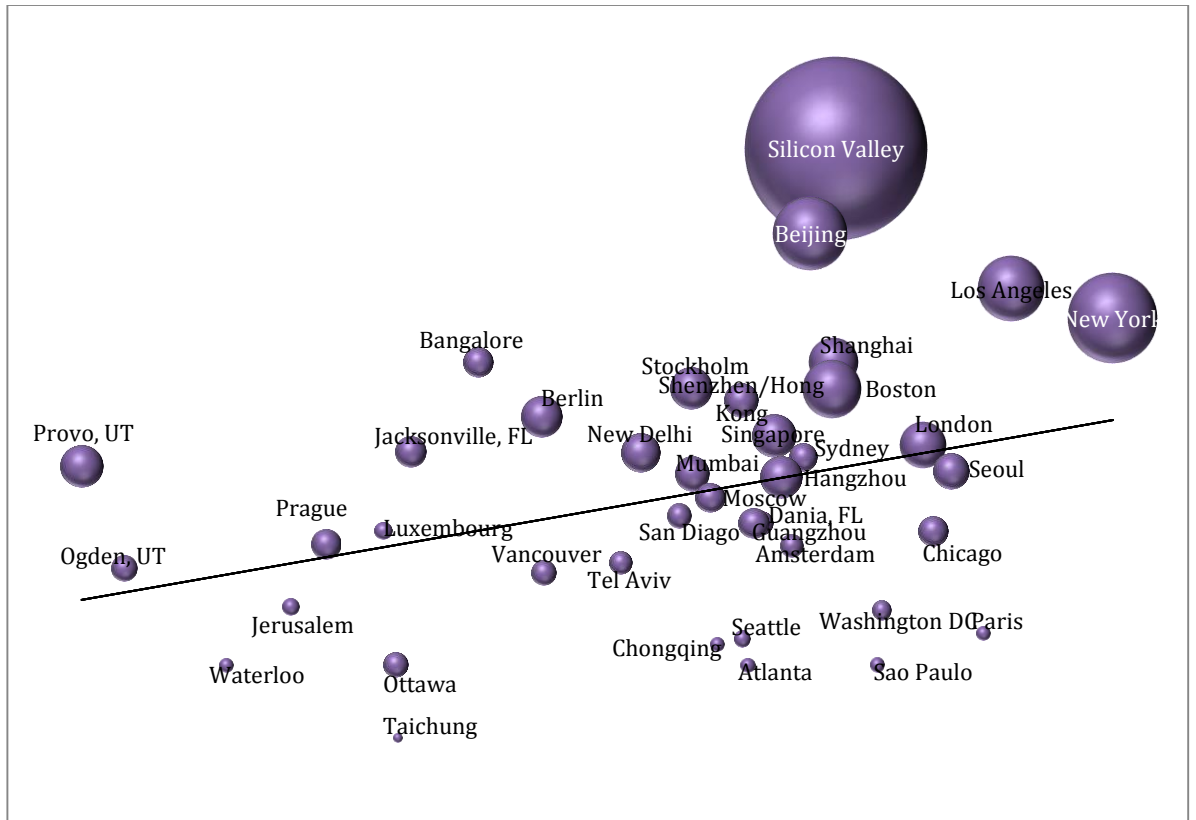


Figure 7: Large Countries Plotted by Valuation of Unicorns and GDP (Top 21 Countries by GDP; x-axis: log of GDP; y-axis: log of total valuation of unicorns)



*Figure 8: Large Countries Plotted by Valuation of Unicorns and GDP
 (Regions with at least one unicorn; x-axis: log of GDP; y-axis: log of total valuation of unicorns; bubble sizes: total number of unicorns)*