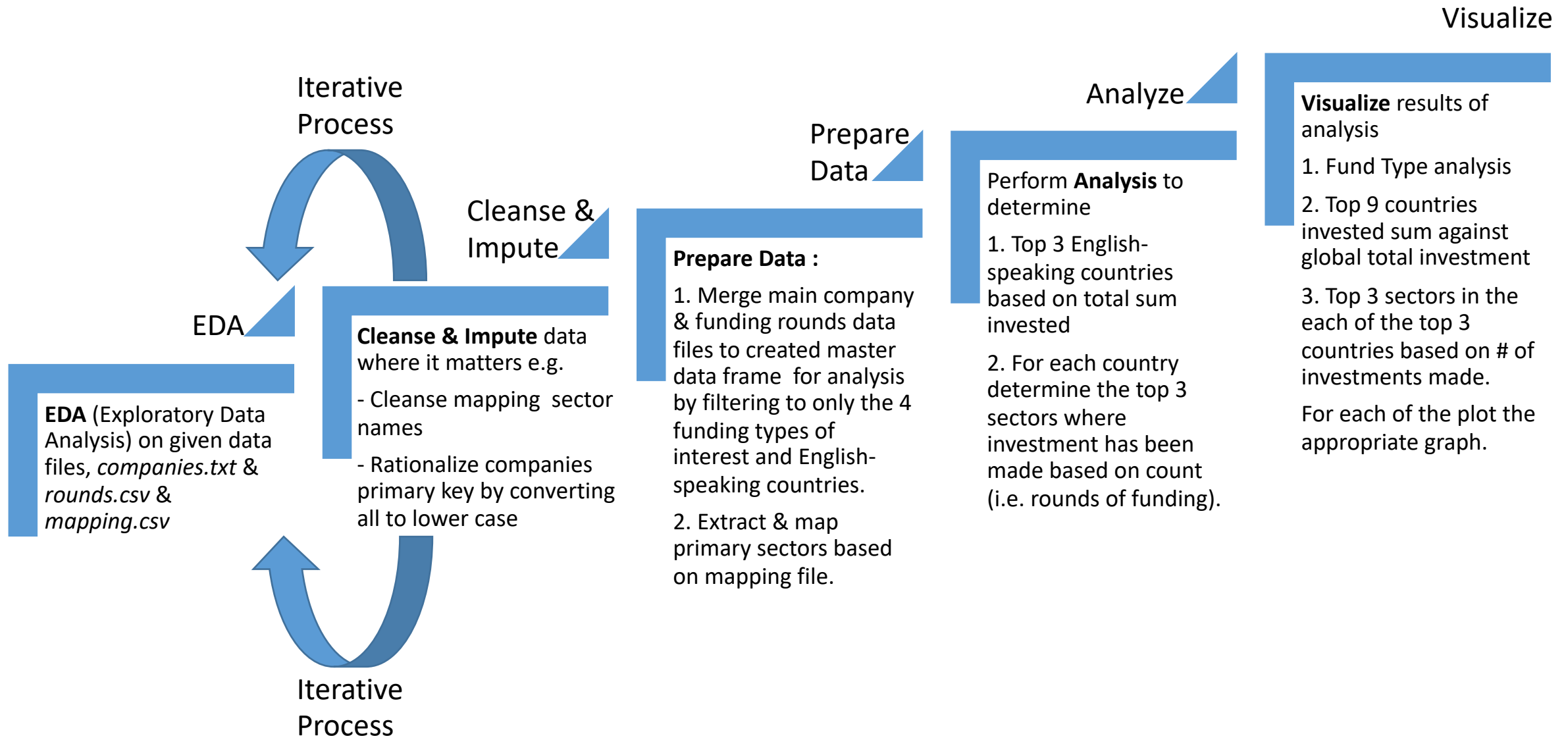# INVESTMENT CASE STUDY

SUBMISSION

Viswajit Iyer

Monday, 22 April 2019

Abstract / Objective

- Spark Funds, an asset management company, wants to make investments in a few companies and needs to understand the global trends in investments to make effective investment decisions.

- The objective is to identify the best sectors, countries, and a suitable investment type for making investments.

- The overall strategy is to invest where most others are investing.

- Spark Funds has two minor constraints for investments:
  - Invest between **5 & 15 million USD** per round of investment.
  - Invest only in **English-speaking countries** because of ease of communication with the companies it would invest in.

- Real investment data has been taken from **crunchbase.com**, with additional data on English-speaking countries here.

Problem solving methodology

Visualize

Iterative
Process

Analyze

Prepare
Data

Visualize results of analysis

1. Fund Type analysis

2. Top 9 countries invested sum against global total investment

3. Top 3 sectors in the each of the top 3 countries based on # of investments made.

For each of the plot the appropriate graph.

Cleanse &
Impute

Perform **Analysis** to determine

1. Top 3 English-speaking countries based on total sum invested

2. For each country determine the top 3 sectors where investment has been made based on count (i.e. rounds of funding).

EDA

Prepare Data :

1. Merge main company & funding rounds data files to created master data frame for analysis by filtering to only the 4 funding types of interest and English-speaking countries.

2. Extract & map primary sectors based on mapping file.

Cleanse & Impute data where it matters e.g.

- Cleanse mapping sector names

- Rationalize companies primary key by converting all to lower case

EDA (Exploratory Data Analysis) on given data files, *companies.txt* & *rounds.csv* & *mapping.csv*

Iterative
Process

Exploratory Data Analysis

- The funding rounds data file seemed to show 7 companies that were not present in the master companies file.
  - Manual analysis revealed that these were due to presence of special characters in the *company_permalink* key column. These were indeed the same companies in both files.
  - Futhermore, **none** of these had any funding amount data or country of origin, and many of them were not operating anymore.
  - Given the relative small number of these, it was decided to ignore these companies for final analysis.

- Companies data
  - Nearly 23% of the companies have no founding date available – not relevant for analysis
  - Nearly 11% (or 7000) of the companies have no country information (nor city, state or region). A manual inspection revealed that one could impute the country based on a search of the crunchbase.com database. Although crunchbase seems to have an API access available, it would be for a fee. Hence it was decided to ignore these for analysis.

- Funding Rounds Data
  - More than 70% of the data has no funding round code – however, this is not relevant for analysis
  - A significant fraction (17%) of data has no funding amount. Values were imputed based on the mean for the respective funding type.
  - However, this did not make a material difference in the final analysis since we are looking a specific average range of funding investment.

- Sector Mapping Data
  - A manual inspection of Sector Category values revealed a pattern that was corrected – Words that had the characters "na" were showing up as 0. e.g A**na**lytics was showing up as A**0**lytics.

Funding Type Analysis

- The average funding amongst the chosen 4 funding types, namely, *venture, seed, angel & private equity,* is shown in the adjacent table.

- Given Spark Funds LLC's constraint of investing in the range of $5 - $15mn, **Venture** funding would be the preferred type.

Funding Type	Avg Investment ($mn)
Venture	11.75
Angel	0.96
Seed	0.72
Private Equity	73.31

Country & Sector Analysis

Country Analysis

- Top 9 English-Speaking countries were determined based on total sum invested in each of the countries, which are shown in the table below.

- Against a Global Sum of around $ 650 billion, the USA has a lion's share of $448 billion with Britain and India coming a distant second & third.

| Country	Sum Invested ($ mn)
USA	448,746
Great Britain (GBR)	23,159
India (IND)	16,366
Canada (CAN)	10,641
Singapore (SGP)	3,581
Ireland (IRL)	2,275
Australia (AUS)	1,534
Nigeria (NGA)	399
South Africa (ZAF)	269
Global	552,869

Sector Analysis

- The table below shows the top three sectors in the top three (USA, Great Britain & India) based on the **number of investment rounds** made for the chosen funding type – *venture.*

- Sectors "**Others**" & "**Social, Finance etc.**" figure in the top 2 for all countries.

- India shared the Top sector with USA & Great Britain, namely, **Others,** along with "**Social, Finance etc.**".

| Primary Sector	Number of Investment Rounds		
	USA	GBR	IND
Others	8,767	580	332
Cleantech / Semiconductors	8,121	460	
Social, Finance, Analytics, Advertising	7,822	481	193
News, Search and Messaging			154

Funding Type Analysis Graph

Plot 1
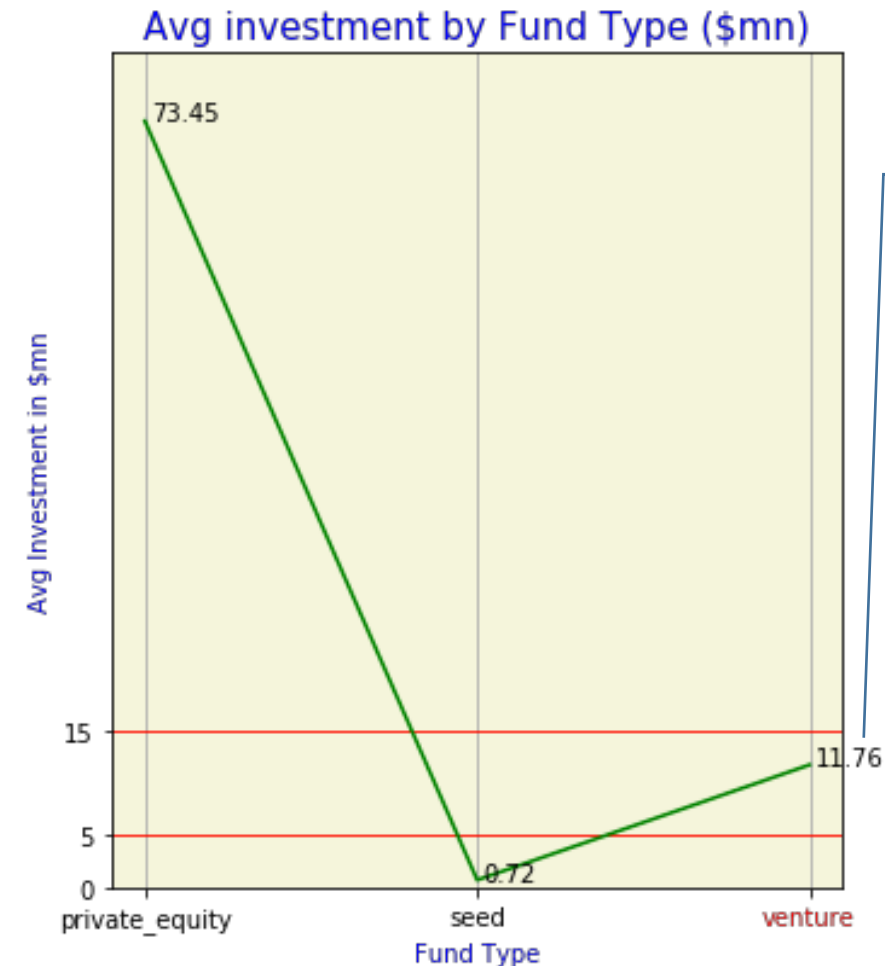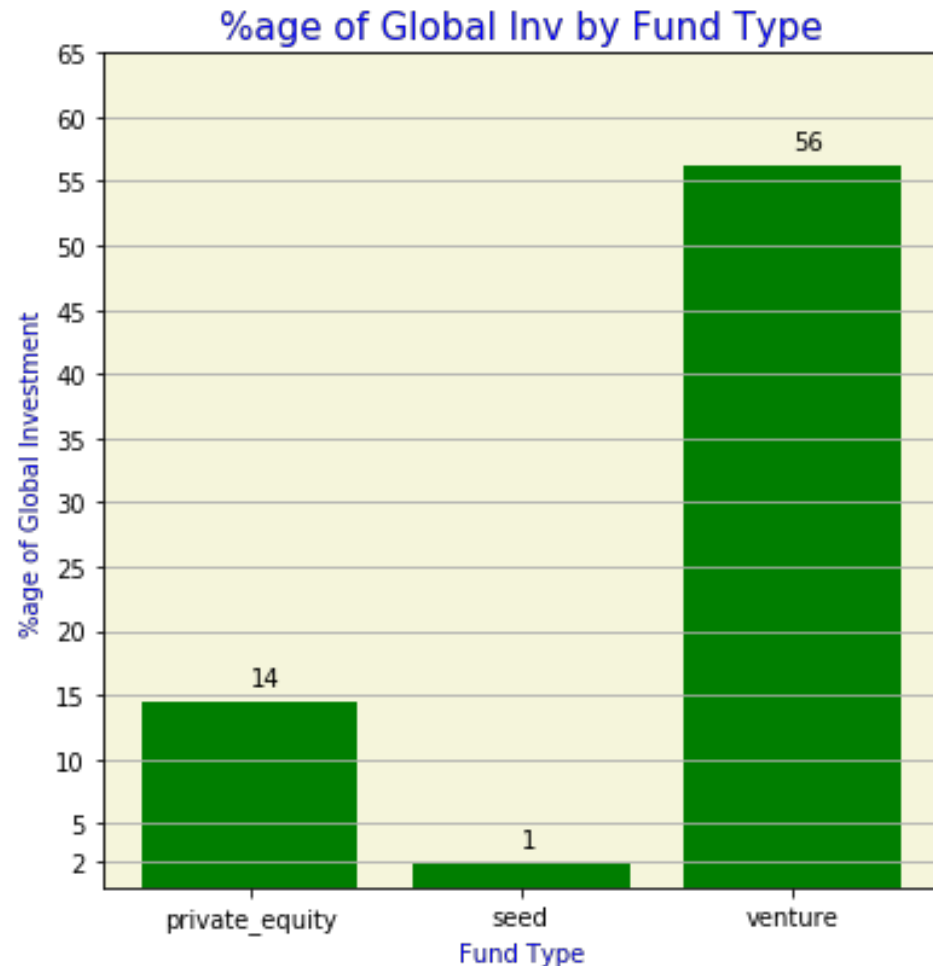
As shown here *Venture* funding type lies within the preferred Investment band limits of $5mn & $15mn

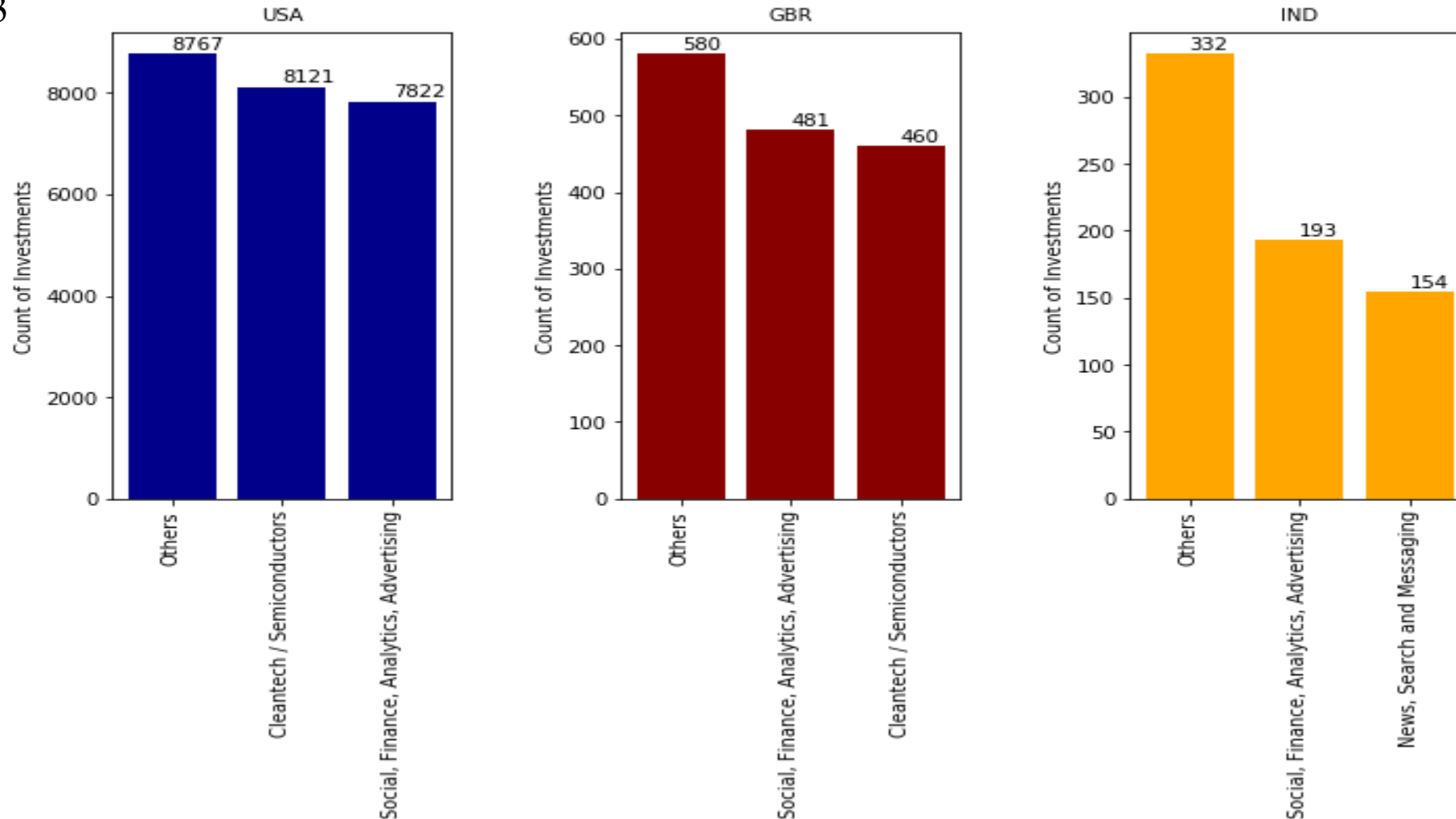# Comparison of Investments Against Global Total ($650 bn)

Plot 2
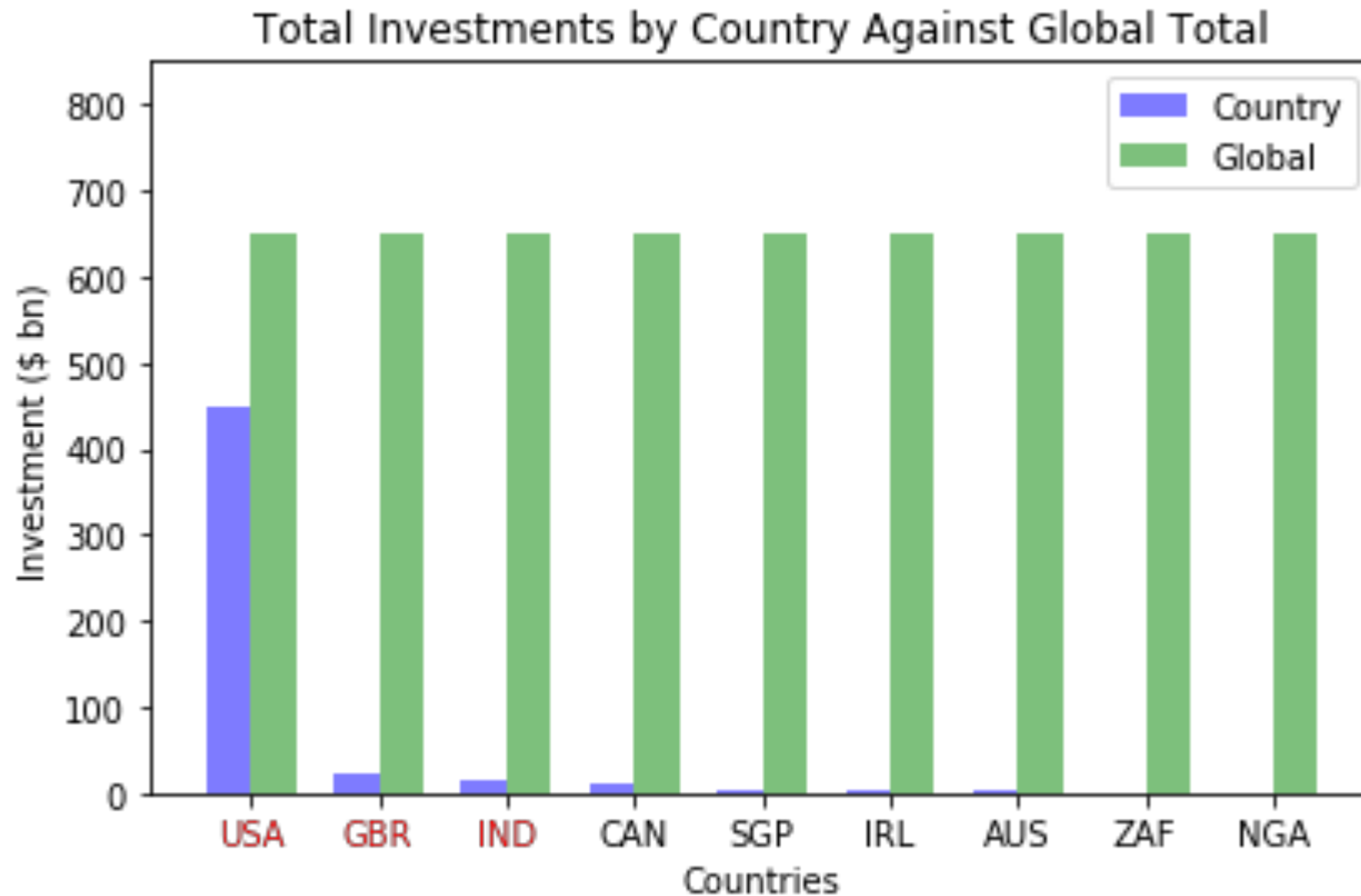
As shown here, USA has the lion's share of funding, followed by Great Britain & India.

Top 3 Sectors in the Top 3 Countries

Plot 3

Top 3 Sectors in Top 3 Countries by Investment Count

Top Sectors

- Others
- Social, Fin etc.
- Clean Tech/Semi

Conclusions

Based on Spark Funds LLC's funding principles & constraints and analysis of available data

- Spark Funds should choose **_Venture_** funding as the preferred funding type.

- The top 3 countries to fund in are **_USA_**, **_Great Britain_** & **_India_** with **overwhelming emphasis** on USA,
  - To the tune of 80-90% invested in the USA

- The following sectors look the most promising to invest in, across the 3 countries
  - Others
  - Clean Tech / Semiconductor
  - Social, Finance, Analytics & Advertising.