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# Stoccer Portfolio Returns



# Motivation & Summary



**BUNDESLIGA**





- European soccer is **35 Billion** dollar per year industry.
  - To put that into context **Capital One Financial** did **32 Billion** and **Coca-Cola** did **31 Billion** in revenue in 2019. (<https://fortune.com/fortune500/2020/search/>)
- In European soccer the revenue of each team depends on...
  - the leagues they play in and their final standing,
  - the competitions they participate in,
  - the competitions they win.
- In other words winning games means more money.
  - ***But what is the cost of winning?***
  - ***What is the Return on Investment (ROI) for team owners?***
  - ***And how much should teams invest in purchasing top players?***

# Questions & Data



We chose PSG as the model team to analyze because they have been one of the most active teams in the transfer market.

PSG was acquired by the king of Qatar in 2011 when its value was approximately €1.17Bn.



- We set out to understand the correlation of money spent on individual players vs. the revenue that a team generates.
- Is the return on the money invested in the club greater than traditional investments?
  - Would team owners do better by investing in traditional stock?
- How has PSG performed compared to other comparable clubs in Europe?
- Have their acquisitions been impactful on the team's revenue.

# Data Cleanup & Exploration

**FBREF** Enter Person, Team, Section, etc

Players Clubs Competitions Countries Matches **17** FBref Newsletter Languages StatsBomb Full Site Menu

**2020-2021 Bundesliga Stats**

← Previous Season

Governing Country: **Germany**

Level: 1st Tier (See League Structure)

Gender: Male

**More league info ▼**

Fußball-Bundesliga History 2020-2021 Bundesliga Overview Scores & Fixtures Squad & Player Stats Nationalities Other 2020-2021 Leagues ▼

## Squad Standard Stats 2020-2021 Bundesliga

Squad Stats

Opponent Stats

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Squad	#	PI	Age	Poss	Playing Time		Performance					Per 90 Minutes					Expected		Per 90 Minutes						
					MP	Starts	Min	Ass	PK	PKatt	CrdY	CrdR	Gls	Ass	G+A	G-PK	G+A-PK	xG	npG	xA	xG	xA	xG+a	xG+a	npG
Arminia	22	26.5	43.9	7	77	630	4	4	0	0	11	0	0.57	0.57	1.14	0.57	1.14	4.5	4.5	3.4	0.64	0.49	1.12	0.64	1.12
Augsburg	21	27.4	37.3	7	77	630	9	7	0	0	14	0	1.29	1.00	2.29	1.29	2.29	6.9	6.9	5.7	0.98	0.82	1.80	0.98	1.80
Bayern Munich	24	27.9	63.0	7	77	630	27	21	3	3	13	1	3.86	3.00	6.86	3.43	6.43	18.7	16.4	14.1	2.67	2.02	4.69	2.34	4.36
Dortmund	22	26.2	64.3	7	77	630	15	13	1	1	10	0	2.14	1.86	4.00	2.00	3.86	15.0	14.3	11.2	2.15	1.61	3.75	2.04	3.64

**kaggle**

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Data Tasks Notebooks (15) Discussion (4) Activity Metadata

Download (107 KB) New Notebook

top250-00-19.csv

Detail Compact Column 10 of 10 columns

**About this file**

Dataset:

There are 4700 total rows and 10 columns in this dataset. The columns contain the following information: the name of a football player, selling team and league, the league and team where a player is sold, an estimated market value of a player, an actual value of a transfer, the position of a player and season when a transfer took place.

A Name	A Position	# Age	A Team_from	A League_from
Name of a football player	Playing position	Age by the time of a transfer	Team that sold a player	League of selling team
3104 unique values	Centre-Forward 26% Centre-Back 15% Other (2768) 59%		Inter 1% Spurs 1% Other (3490) 97%	Premier League 13% Serie A 13% Other (3490) 74%
Luis Figo	Right Winger	27	FC Barcelona	LaLiga
Hernán Crespo	Centre-Forward	25	Parma	Serie A
Marc Overmars	Left Winger	27	Arsenal	Premier League
Gabriel Batistuta	Centre-Forward	31	Fiorentina	Serie A
Nicolas Anelka	Centre-Forward	21	Real Madrid	LaLiga
Rio Ferdinand	Centre-Back	22	West Ham	Premier League
Flávio Conceicao	Central Midfield	26	Dep. La Coruña	LaLiga
Savo Milosevic	Centre-Forward	26	Real Zaragoza	LaLiga
David Trezeguet	Centre-Forward	22	Monaco	Ligue 1
Claudio López	Centre-Forward	25	Valencia CF	LaLiga

**Summary**

- 1 file
- 10 columns



# Data Exploration

- While exploring our data, we observed that data was entered inconsistently over the course of several year. For example, we noticed that certain soccer statistics only began appearing on stats sheets within the last few years, possibly due to the current use of advanced metrics.
- Publicly available, high-quality data is rare and one must usually contend with very incomplete data
- Pulling data from Alpaca required the use of the `alpacaenv` but plotting the data required using the `pyvizenv`



# Data Cleanup

- There are instances when dropping null values is not advantageous. For example, when plotting returns of two assets with disparate value, changing a null to a zero instead of dropping it starts both the assets from zero
- There are ways of slicing data that does not actually produce a subset of data but shows you a view of that data
- Data cleanup was time consuming but extremely important

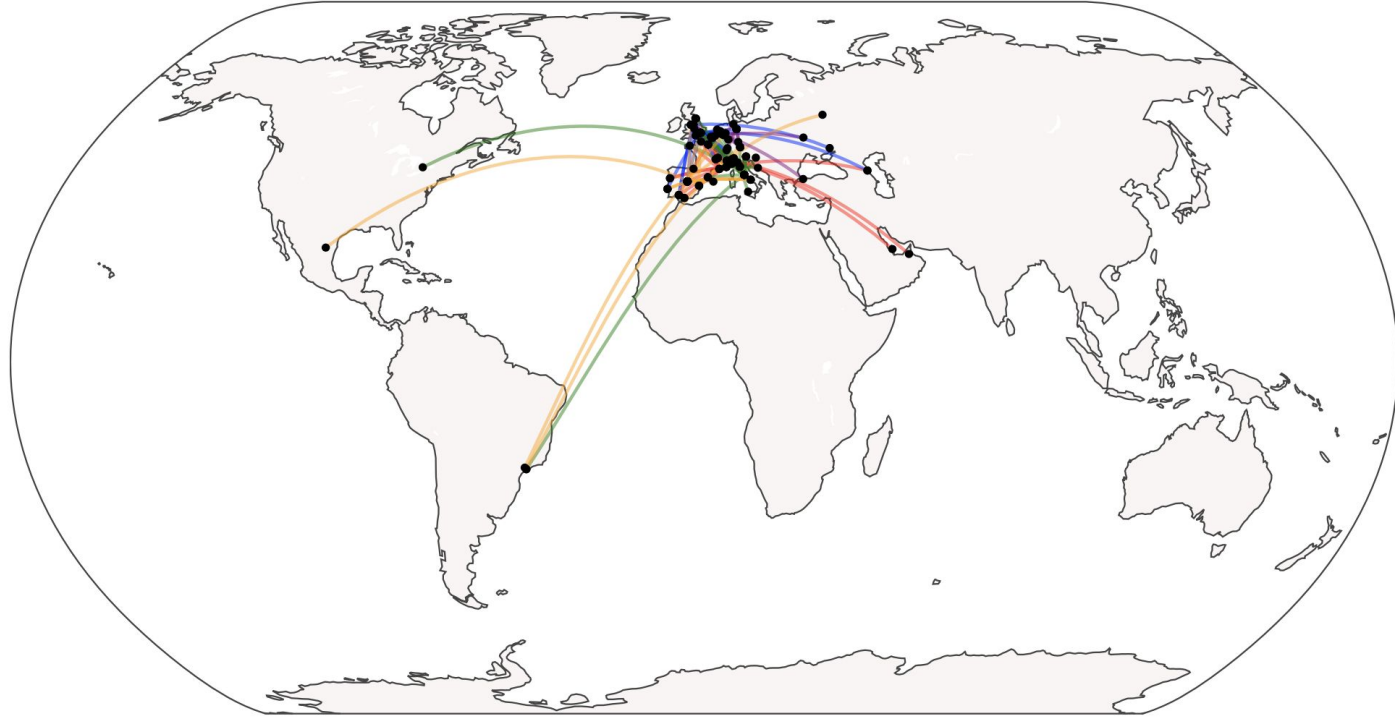


# Data Analysis

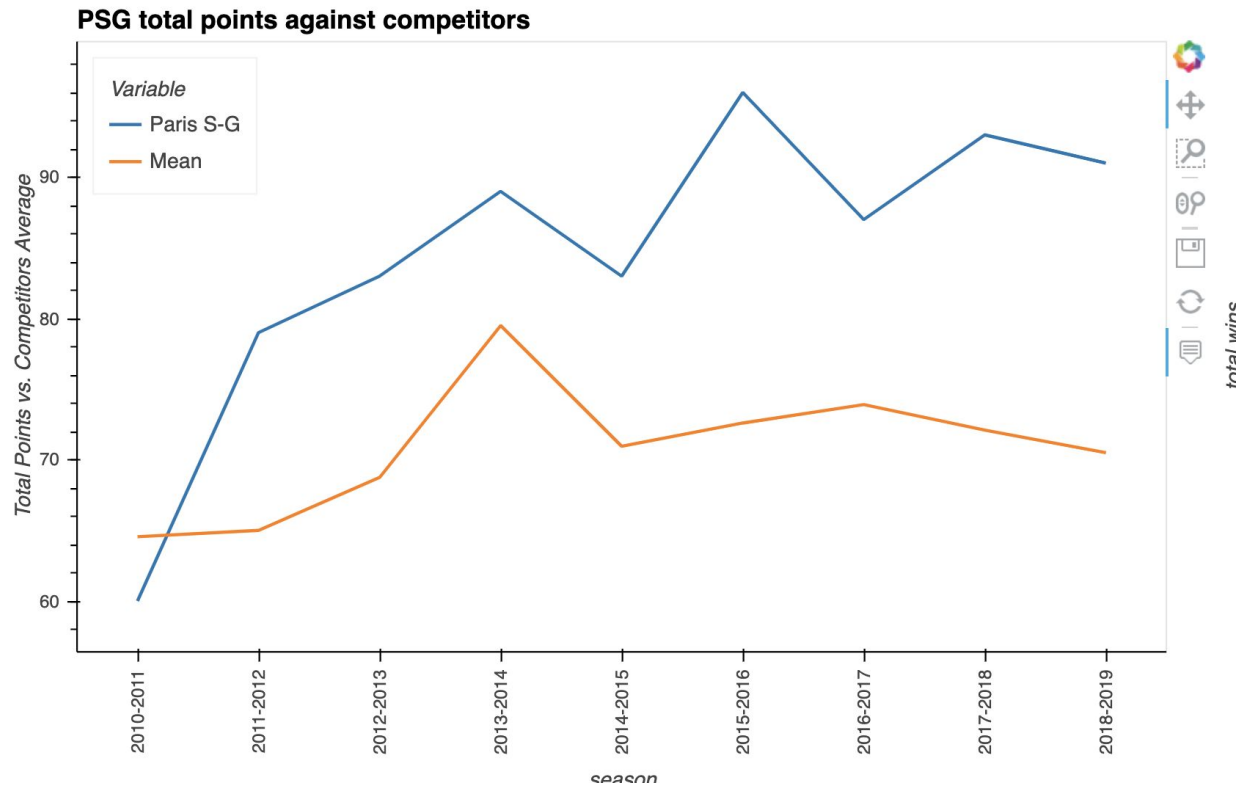




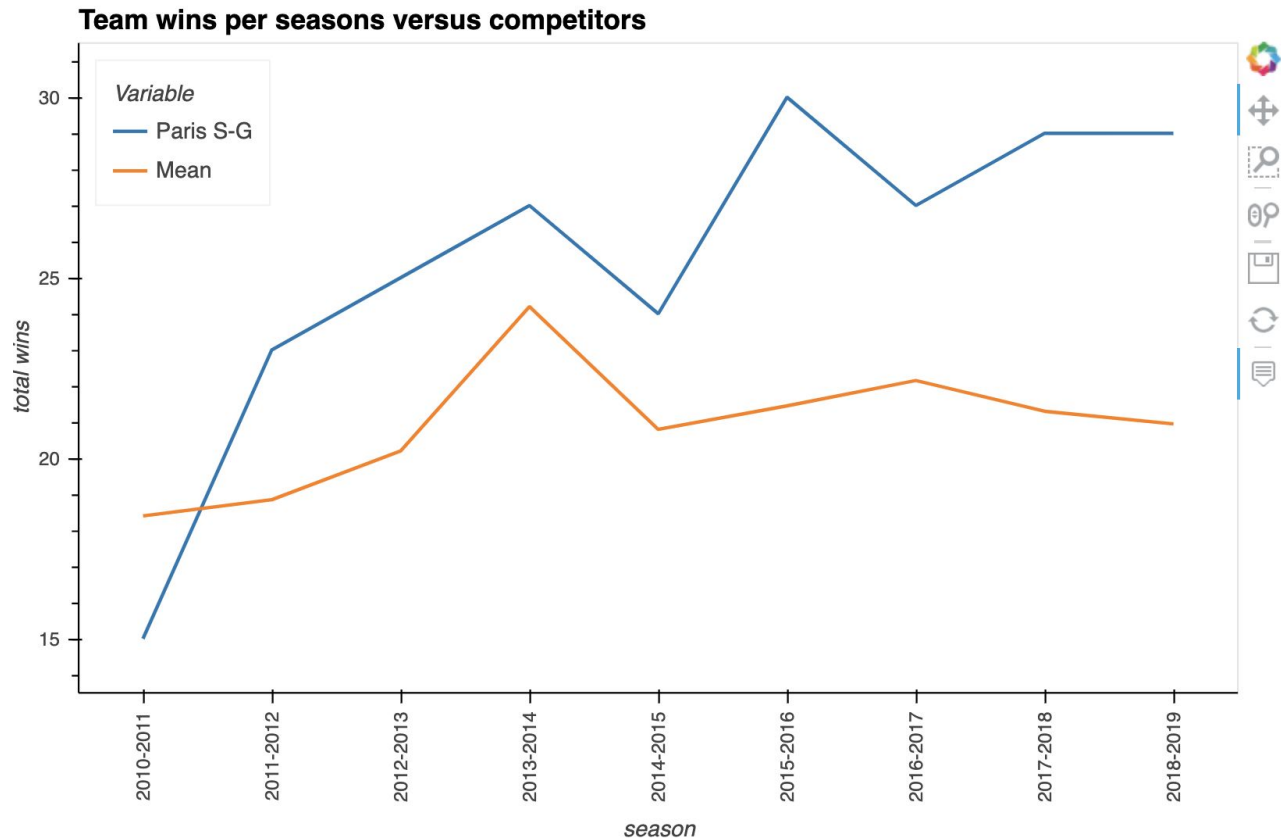
## Season 2013-2014 Player Transfers



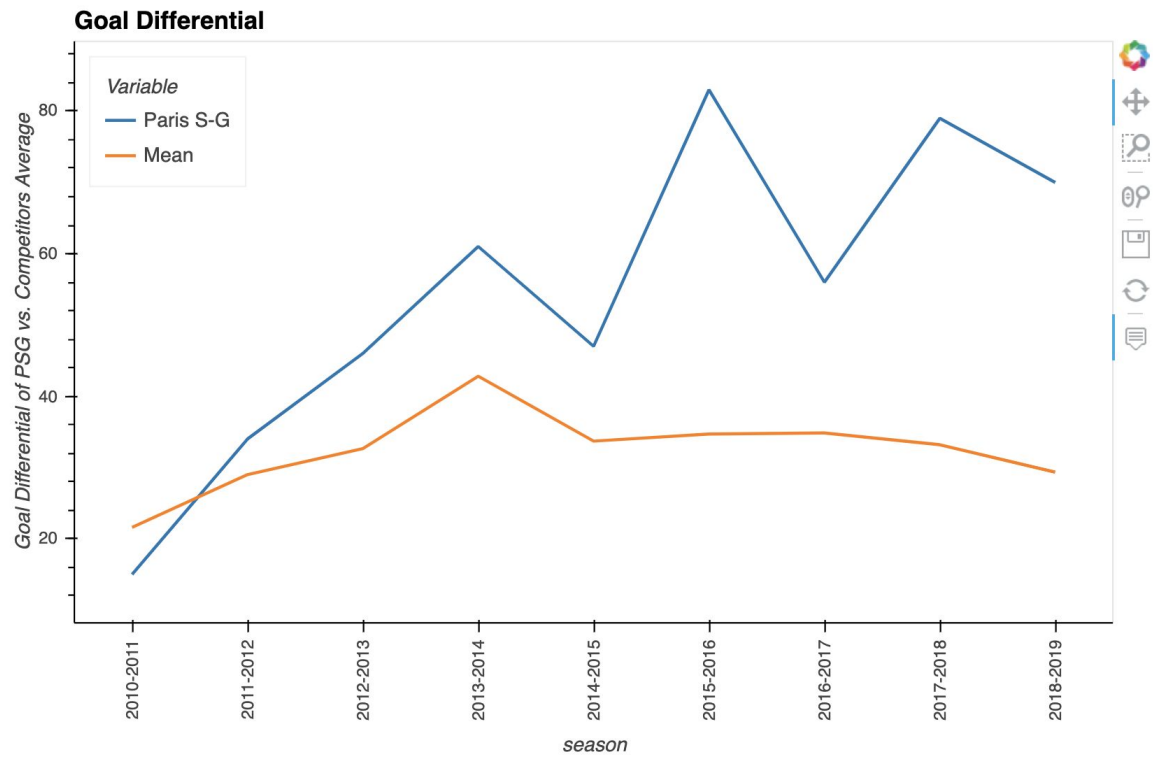
# Team Performance



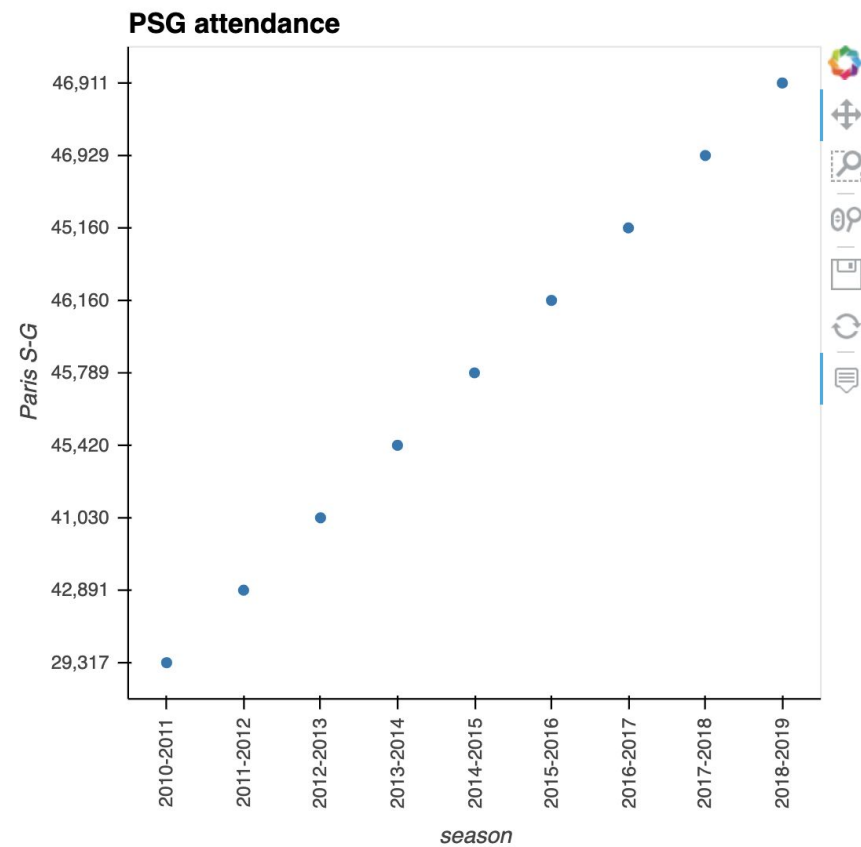
# Team Performance



# Goal Differential

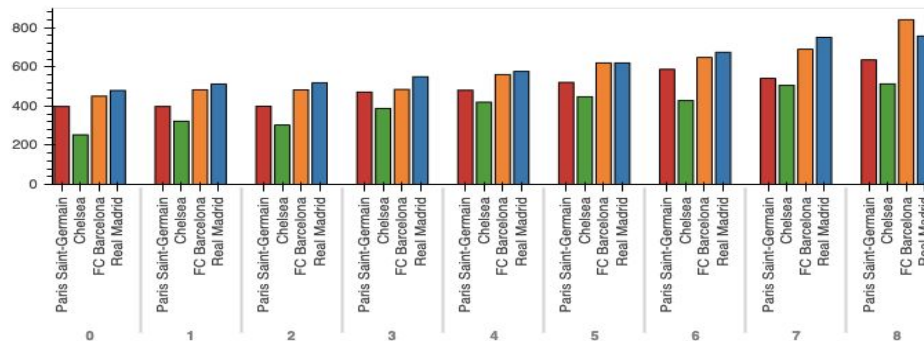
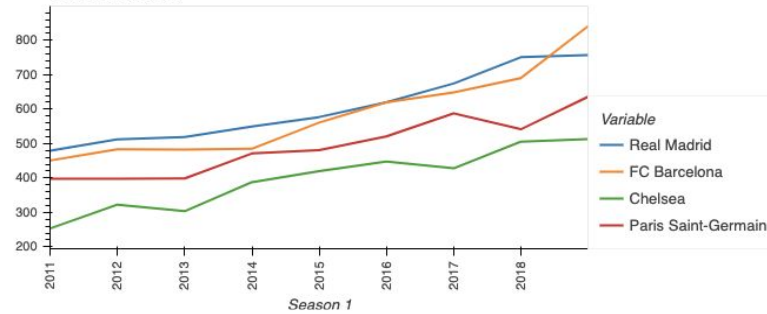


# Attendance



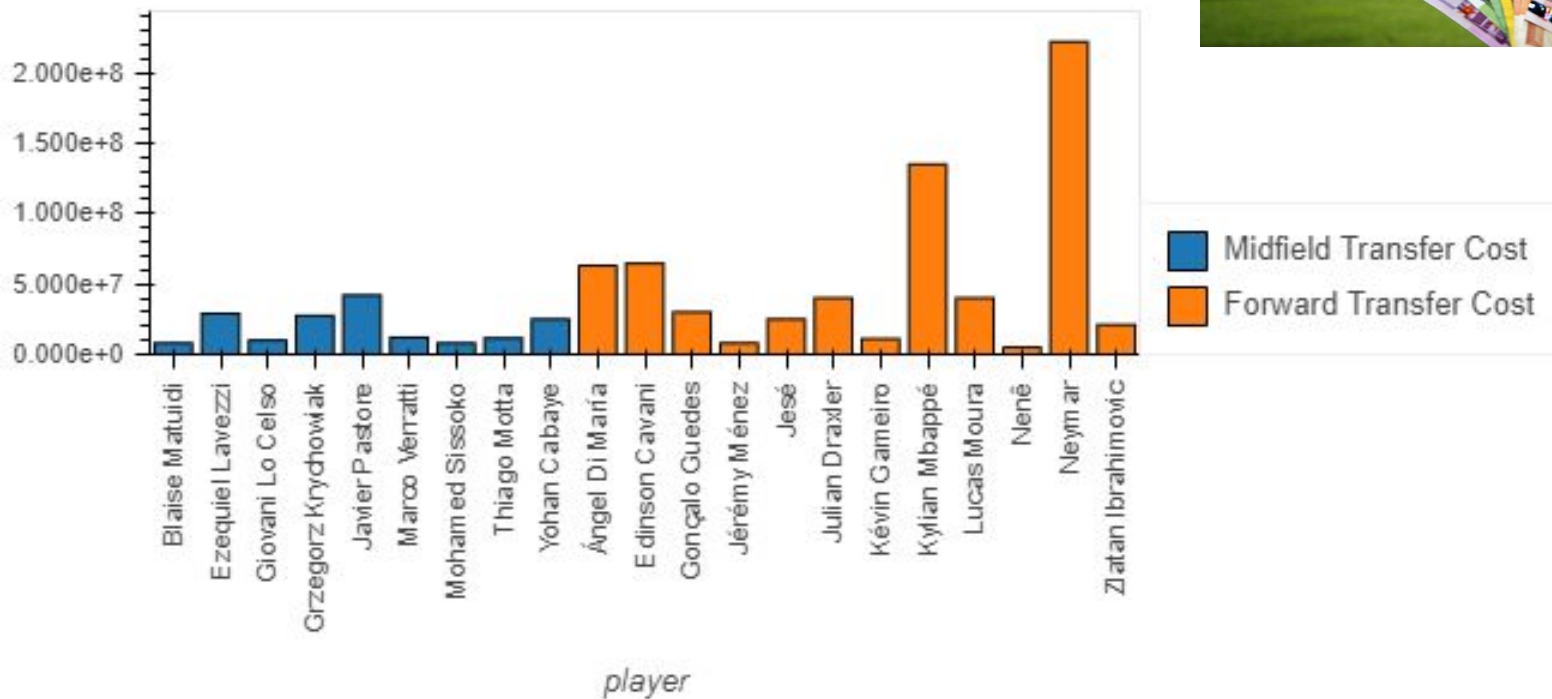
# Team Revenue by Year and Transfers per Year

Team Revenue

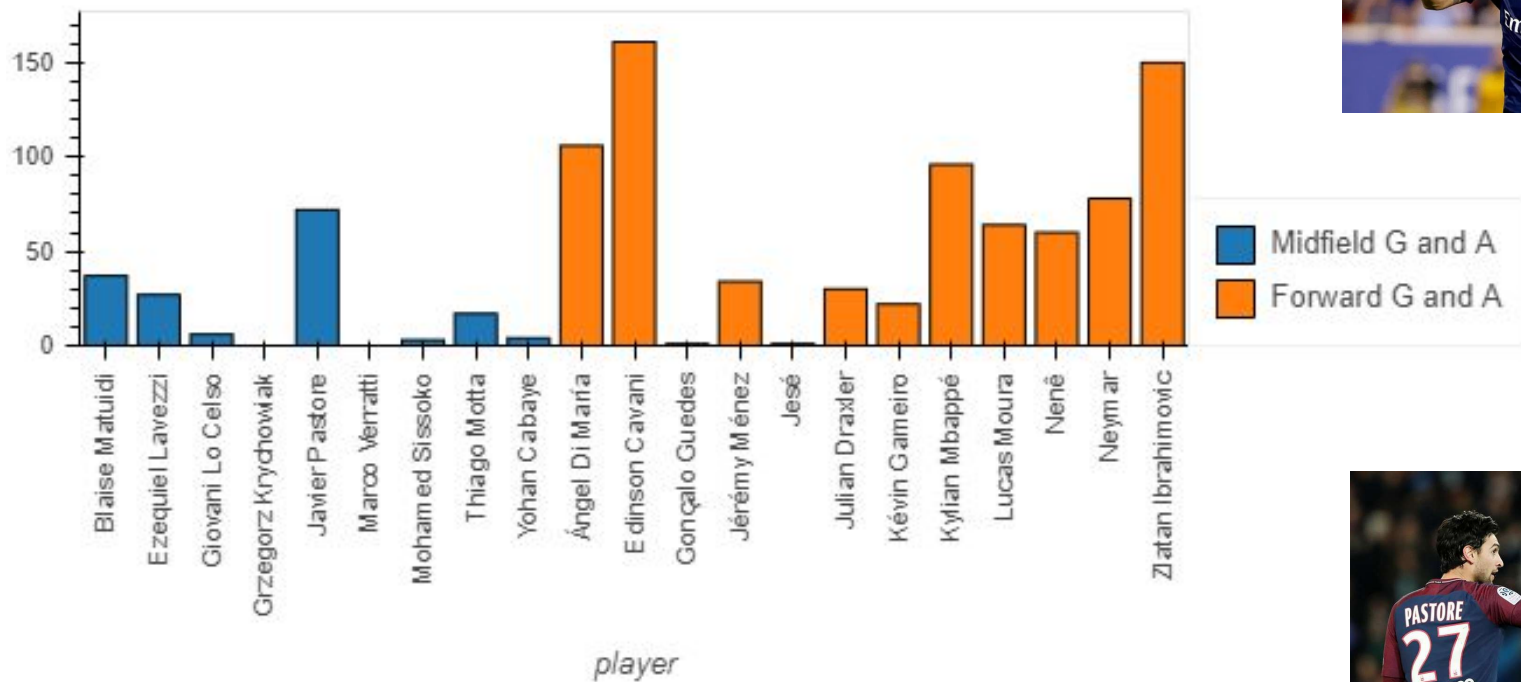




# Forwards vs Midfielders Cost



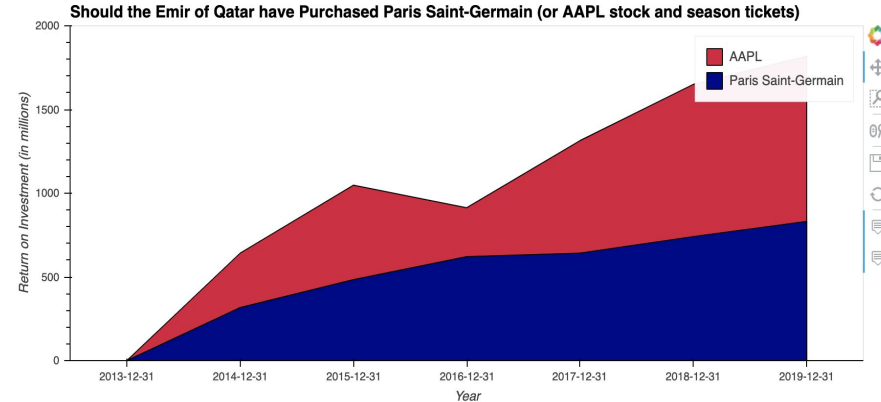
# Forwards vs Midfielders Productivity





# Analysis of the Emir of Qatar's Investment in Paris Saint-Germain

- Used Alpaca to pull AAPL stock prices 2013-2019
- Used a csv file with Paris Saint-Germain's estimated value from 2013(1st year available)-2019
- Calculated AAPL daily returns and converted to yearly returns by resampling
- Plotted the yearly returns





# Discussion



# Reason vs. Passion?

## Findings:

- Transfer of high quality players for PSG significantly improved teams performance relative to its competitors.
- Increased performance also contributed to higher attendance.
- Passion project?
  - The yearly returns on the investment in the Paris Saint-Germain soccer club are very good--it is now worth 8x as much as when it was purchased
  - It appears that certain traditional investment such as an investment in AAPL would have been better
  - Our project will ultimately add transfer fees into the analysis, which should skew the results even more in AAPL's favor



# Postmortem



### Additional Questions...

- Extend our in-depth analysis to include more teams and more seasons...
- Assess PSG's expenditure in transfer players versus other teams...
- *Was PSG just particularly effective?*
- Monte Carlo Simulation to predict the probability of buying players with certain qualifications.

### Difficulties...

- A lot of data to sift through...
  - Making decisions on which data to concentrate on very difficult.
- Inconsistent data sets over numerous years and across various sources
- Comparing a privately held soccer club, Paris Saint-Germain (PSG), to a traditional investment, Apple stock, proved difficult due to incompatible data timeframes
  - (i.e., daily price for stock vs. yearly valuation for a soccer club)
- Our data included words in languages other than English, which multiplied the potential spelling variations (e.g., accent marks, hyphens, etc.)

# Questions?

