

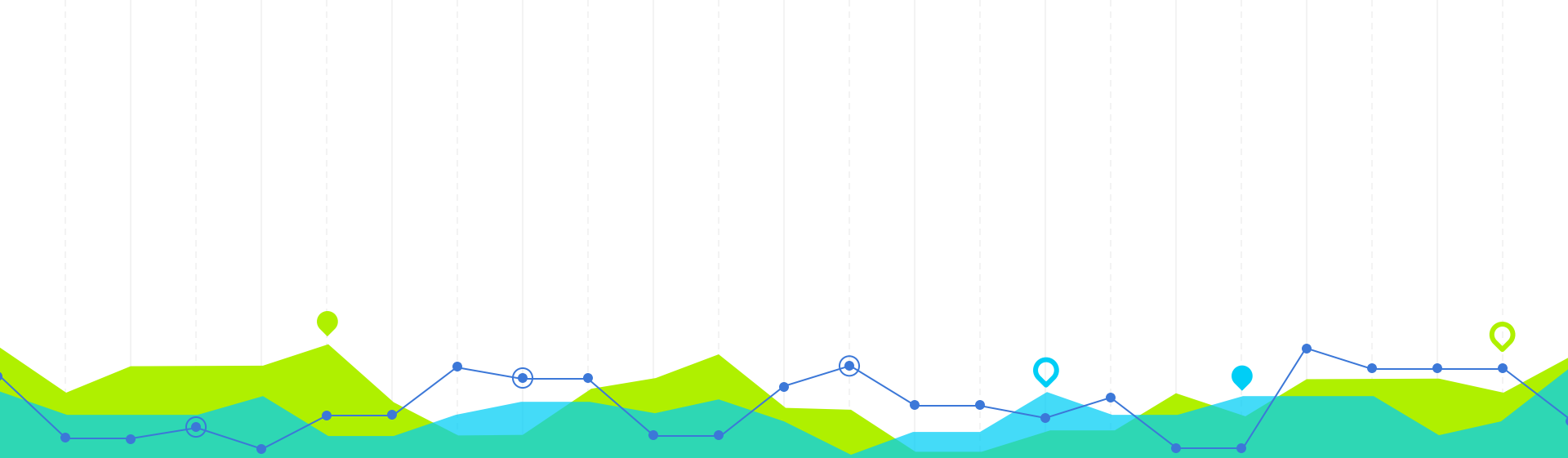
DATA Initiative Lab Analysis

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What is the relationship between company success and the compensation of its top executives?





Data Wrangling

Combining the Provided Dataset with Stock Information

1

SOURCING STOCK DATA

- CRSP allows academic researchers to access historical data on securities
- Used CRSP to find the ending stock price for each month from January 2010 to December 2020
- Exported the ticker and closing stock price of 489 companies



COMBINING THE DATASETS

PERMNO	date	TICKER	PRC	SHROUT
10104	20100129	ORCL	23.06	5011220
10104	20100226	ORCL	24.65	5015000
10104	20100331	ORCL	25.71	5019091
10104	20100430	ORCL	25.8675	5029523
10104	20100528	ORCL	22.57	5026000
10104	20100630	ORCL	21.46	5026000

- Dates were sliced to match the main dataframe style
- The two identifying values, year and ticker, were used to map stock price

COMBINING THE DATASETS (CONT.)

ADM	dict	11	{2010.0:[29.97, 29.36, 28.9, 27.94, 25.27, ...], 2011.0:[32.67, 37.18, ...
CDNS	dict	11	{2010.0:[5.81, 5.7, 6.67, 7.4525, 6.7, ...], 2011.0:[8.68, 9.95, 9.75, ...
CERN	dict	11	{2010.0:[75.66, 82.95, 84.93, 84.77, 83.71, ...], 2011.0:[98.85, 100.4 ...

- Each company was a key in a main dictionary
- Years are subkeys
- Stock prices were in a list associated with the year

COMBINING THE DATASETS (CONT.)

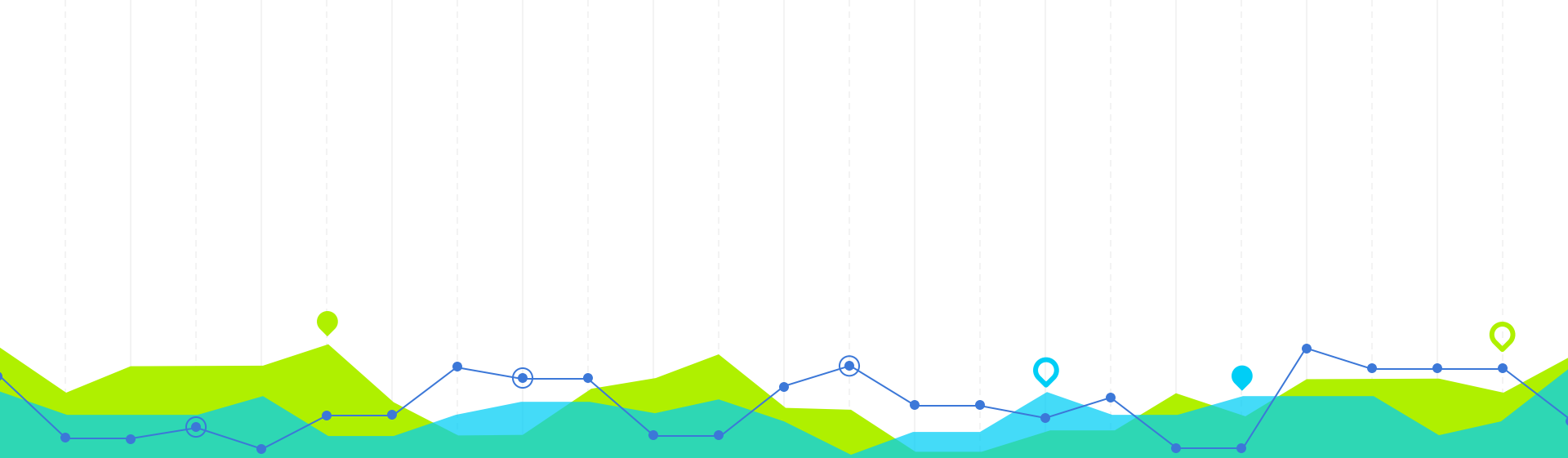
EXEC_FUL	CO_PER_R	CONAME	SALARY	AGE	EXECRANK	TDC1	TDC1_PCT	GVKEY	EXECID	YEAR	GENDER	TICKER
Gerard J. A	14221	AMERICAN	669.646	51	1	5231.393	10.77	1045	14591	2010	MALE	AAL
Daniel P. G	16477	AMERICAN	530.478	52	4	2372.14	9.762	1045	16654	2010	MALE	AAL
Gary F. Ker	29348	AMERICAN	502.543	55	5	1776.069	28.245	1045	28279	2010	MALE	AAL

- Set a new price column equal to 'nan'
- Replaced the value with the final stock price for each year if available

COMBINING THE DATASETS (CONT.)

- Updated dataframe is reflective of a company going public
- Executives with the same ticker and year get the same stock price

1045	41119	2012	FEMALE	AAL	nan
1045	44119	2012	MALE	AAL	nan
1045	16654	2013	MALE	AAL	25.25
1045	26059	2013	MALE	AAL	25.25
1045	41119	2013	FEMALE	AAL	25.25



Data Visualization

2

Graphing Average Executive Compensation Against Stock Price

AVERAGE EXECUTIVE COMPENSATION

- Average compensation calculated for all executives
- Matched with the appropriate year's stock price
- Ran Pearson's correlation test
- Ensured outliers didn't significantly impact best fit line

PEARSON'S CORRELATION

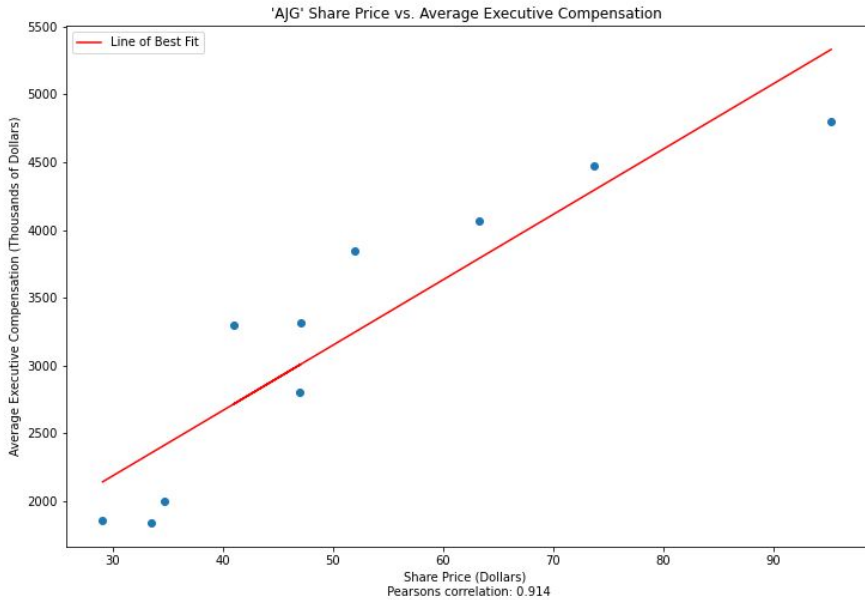
- Measures association between quantitative variables
- Value of 1 represents a strong positive association
- Value of 0 indicates no relationship
- Calculated using scipystats and displayed under graph

STRONG, POSITIVE CORRELATION - GALLAGHER

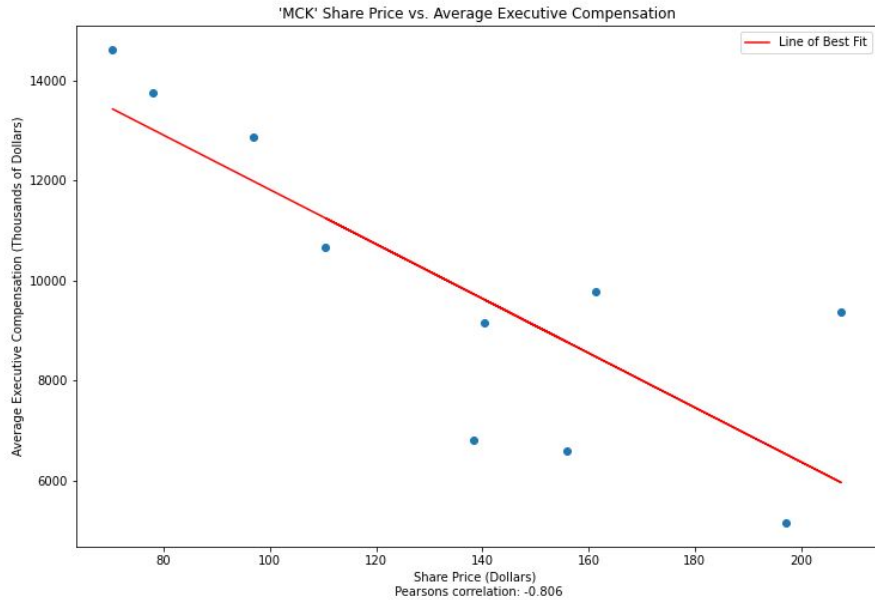
Additional Context

- CEO and executive compensation raises are reflective of company success and strong leadership
- Compensation is important when retaining C-suite leaders

Source: Gallagher



STRONG, NEGATIVE CORRELATION - MCKESSON

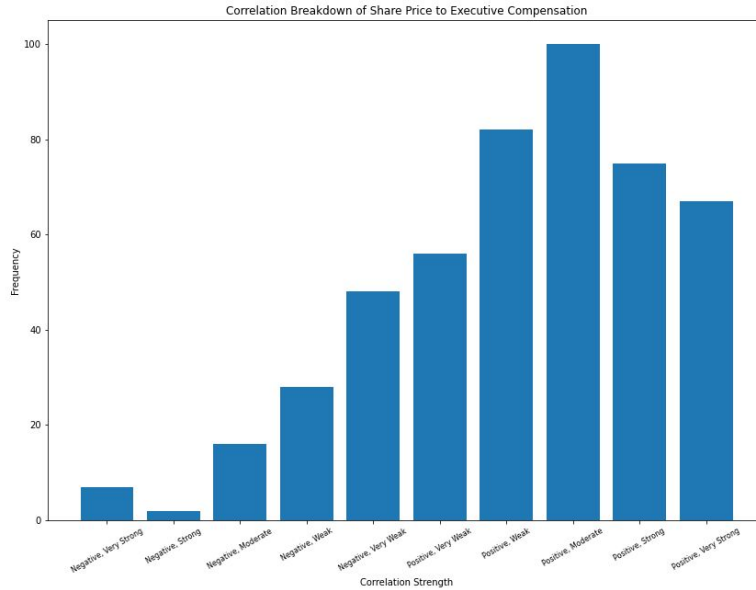


Additional Context

- Public scrutiny through the opioid crisis led to a decrease of executive pay
- Shareholders continue to complain about unfair compensation

Source: Fortune

PEARSON'S CORRELATION BREAKDOWN

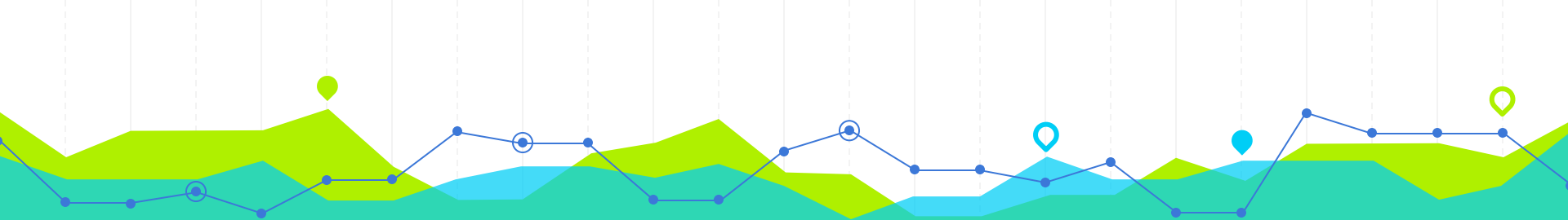


○ Left skewed

○ Unimodal

THEMES FROM ADDITIONAL RESEARCH

- Companies reward executives for performance with higher compensation
- Important for company retention
- Investors reject executive pay packages in instances of public scrutiny and scandals



Thank you!