





## Setting

Background Objectives Approach Analysis Proposal End Appendix We are in 2020, Nuveen's Marketing has a critical task to achive : To correctly assign covering channels. But which advisors to chose? Even more important, which ones not to? Why is this critical? Can Ai helps? Is this even possible? How?

Questions will be answered, explanations given and solutions found.

Nuveen's *brightest days* are yet to come ...



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# E



Nuveen is a *mutual fund company* headquatered in Chicago. Under the leadership of *TIAA since 2014*, it invests in the growth of businesses, real estate, infrastructure, farmland and forests while building long-term relationships with

clients from all over the globe.

### Nuveen has *three goals* :

- To acquire new clients cost-effectively.
- To sell more to existing clients.
- To reduce redemption.

While data science could help for all three, we will focus on the *second* and might discover some hints about the *first*.



### **2,900+** Employees worldwide

**22** Countries with local expertise

**120+** Years of investment experience



Nuveen charges investors a percent of assets under management (AUM). Therefore, the more they *sell* and the *longer* clients stay in their mutual funds, the more *revenue* they receive.

Setting Background *Objectives* 

Approach Analysis Proposal End Appendix On the past 3 years (2017-2019) **97%** of Nuveen's sales were made by **20%** of their advisors. Nuveen cannot afford to spend the same amount of time for each advisor. They need to know which advisors will make those **20%**.



To help Nuveen's *makerting team* to accurately target *high-value advisors*, we will leverage the power of *Ai*. Based on *2018* and *2019* data set, we will predict *2020 sales* and from them, identify the advisors.





Pipeline Train 2018-2019 Setting Background **Objectives** Approach Analysis **Proposal** End Appendix



Train and run pipeline , more details in appendix 1 & 2.

#### Heroes vs Zeros.

On the 2018 and 2019 data set, **63%** of advisors did not sale anything. These advisors are noise we need to remove. To that end, we first **train** a classifier which will filter them out.

#### **Predict sales.**

Using our heroes, we will then *train* a regression model to predict annual *sales* for each advisor.

#### 2020.

Using the *pretrained* models we will follow the same pipeline to *predict* 2020 *sales*.







*Model,* but what drives it ?



Feature importances by related features.



Decomposition of 44% Aum related features.

### **Redemption.**

44%

In our model, features related to redemption represent **21%** of features weight. Because we know redemption has a negative impact on sales, it confirms Nuveen **third goal** : To reduce redemption.

#### Features that matter.

Aum of *asset classes* and *products* account for **44%** of the weights in the model decision. We would need more information from Nuveen about those features to draw any further business conclusions.

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### *Lift chart* based on 2020 predictions

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Decile	No. advisors	Actual sales per advisor	Lift over average	Cumulative No. advisors	sales per advisor	Cumulative lift
1	479	\$ 2,843,355	567%	479	\$ 2,843,355	567%
2	478	\$ 713,091	67%	957	\$ 1,779,336	318%
3	478	\$ 315,134	-26%	1,435	\$ 1,291,609	203%
4	478	\$ 189,240	-26%	1,913	\$ 1,047,617	146%
5	478	\$ 99,112	-77%	2,391	\$ 876,014	106%
6	478	\$ 56,282	-87%	2,869	\$ 746,575	75%
7	478	\$ 27,320	-98%	3,347	\$ 647,991	52%
8	478	\$ 10,370	-99%	3,825	\$ 568,309	33%
9	478	\$ 4,472	-99%	4,303	\$ 505,675	19%
10	479	\$ 2,457	-99%	4,782	\$ 455,269	7%
	4,782	426,083	0%			Lift chart on Nov 2020.







### Lift chart analysis

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The previous lift chart was based on the 2020 predictions. *But how reliable are they?* 

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cile	Prediction	Actual	Error %
1	\$ 3,566,531	\$ 2,843,355	25%
2	\$ 695,931	\$ 713,091	-2%
3	\$ 344,233	\$ 315,134	9%
4	\$ 193 <i>,</i> 403	\$ 189,240	2%
5	\$ 110,716	\$ 99,112	11%
6	\$ 62,923	\$ 56,282	11%
7	\$ 32,276	\$ 27,320	18%
8	\$ 13,972	\$ 10,370	35%
9	\$ 5,350	\$ 4,472	19%
10	\$ 1,530	\$ 2,457	-38%

The two first deciles contain the **most valuable advisors**. For those two, the prediction is on average **86%** reliable.

Prediction vs Actual error per decile.







**Prediction,** is the future bright?

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#### Time travelling.

Having access to 2020 data set, we can visualize the *prediction* vs *actual* for the year *2020*. We can see our model has predicted 20% above actual.

### *What if ... ?*

Could we have used our *model lift over* to forcast 2020 sales?

Our lift chart compares against the *average of actual sales*. Knowing how marketing is currently managing their customers would help us to adjust our lift over *reference* and better understand our model benefit.





### What about channels?

Decile	National Broker-Dealer	Dual	Independant Dealer	Fee-Based adviser	Bank/Trust	Discount	Networker	Private client group
1	216 - 32%	3 - <1%	237 - 44%	9 - 2%	7 - 1%	1 - <1%	4 - 2%	1 - <1%
2	<b>191 - 40%</b>	11 - 2%	256 - 57%	10 - 2%	7 - 1%	1 - <b>&lt;1%</b>	1 - <1%	1 - <1%
							Decile 1 and 2 c	hannels composition.

*National Broker-dealer* represents **40%** of the *sales* for *decile 2*, which accounts for **191** *advisors*.

The *lift chart* revealed that the advisors to target are from decile 1 and 2, *but* it is important to notice Nuveen is higly dependent of only two channels : *National Broker-Dealer* and *Independent Dealer*. They respectively represent **36%** and **51%** of the first two deciles, **87%** in total.

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hanks to the power of Ai, Nuveen's Marketing can now allocate time to its advisors **630% more** efficiently (decile 1 and 2).

However the models we used can be improved. As seen in the Approach chapter, the 2020 regression model was only **70%** accurate. More data but also more features would benefit future predictions.

Based on our liftChart analysis, we recommend Nuveen to diversify by acquiring more advisors from the following channels : *Fee-base adviser* and *Bank/Trust*.







### **References :**

- Scikitlearn/.../machine\_learning\_map/
- Kaggel/learn
- Storytelling with data. <u>Cole Nussbaumer Knaffic</u>
- Nuveen website
- Emeritus' office hours

### Acknowledgements :

Thanks to Emeritus and Columbia teams for this program and their support, especially Carleton Smith for his great office hours. I could not emphasize enough the value they brought me throughout the modules (Ai, Ml and Capstone).

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Appendix



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Thank you !



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### Appendix 1 : Data and Model processing



Train pipeline details







	Appendix 2 : Data preparation Data cleanina:	rocessing details <b>Feature Engineering</b> :	
Setting Background Objectives Approach Analysis Proposal End <i>Appendix</i>	From negative to 0 : • no_of_sales_12M_1 • no_of_Redemption_12M_1 • no_of_sales_12M_10K • no_of_Redemption_12M_10K • no_of_funds_sold_12M_1 • no_of_funds_redeemed_12M_1 • no_of_funds_Redemption_12M_10K • no_of_assetclass_sold_12M_1 • no_of_assetclass_redeemed_12M_1 • no_of_assetclass_redeemed_12M_1 • no_of_assetclass_sales_12M_10K • no_of_assetclass_sales_12M_10K • no_of_assetclass_Redemption_12M_10K • No_of_fund_curr • No_of_asset_curr • sales_curr • sales_12M • new_Fund_added_12M From positive to 0 : • redemption_curr • redemption_12M	From no_of_sales_12M_1 + no_of_sales_12M_10K no_of_Redemption_12M_1 + no_of_Redemption_12M_10K no_of_funds_sold_12M_1 + no_of_fund_sales_12M_10K no_of_assetclass_sold_12M_1 + no_of_assetclass_sales_12M_10K no_of_assetclass_redeemed_12M_1 + no_of_assetclass_Redemption_12M_10K No_of_assetclass_redeemed_12M_1 + no_of_assetclass_Redemption_12M_10K No_of_asset_curr sales_curr + sales_12M redemption_curr + redemption_12M new_Fund_added_12M redemption_rate AUM (NetFlows) aum_AC_EQUITY,, aum_P_UIT CONTACT_IB refresh_date	To no_of_Redemption_12M no_of_funds_redeemed_12M no_of_assetclass_Redemption_12M no_of_sales_12M no_of_funds_sold_12M no_of_assetclass_sold_12M total_sales (annual sales) total_redemption new_Fund_added_12M AUM (NetFlows) aum_AC_EQUITY,, aum_P_UIT