singularForecast

December 14, 2023

1 Using Machine Learning to predict Financial Crises

Author: Chris Reimann **Date created:** 2023/12/12 **Last modified:** 2023/12/12 **Description:** This notebook runs a strict forecast robustness check.

[1]:
```
# Import Packages
from prepareData import Data
from doExperiment import Experiment
import pandas as pd
```

[2]:
```
# Define Indicator Sets
iv_macro = ["rconsbarro", "iy", "money", "xrusd", "cpi", "ca"]
iv_financial= ["tloans", "debtServ", "yieldCurve", "ltd", "debtgdp",␣
 ↪"globaltloans", "globalyieldCurve", "hpnom"]
iv_all = iv_macro + iv_financial

# Construct Datasets
df_macro = Data(indicators = iv_macro, crisisData = "MacroHistory").
 ↪getReady("Macro")
df_financial = Data(indicators = iv_financial, crisisData = "MacroHistory").
 ↪getReady("Financial")
df_all = Data(indicators = iv_all, crisisData = "MacroHistory").getReady("All")
```

```
Macro: The final dataset contains 1591 observations with 63 distinct crisis
events.
Financial: The final dataset contains 1159 observations with 46 distinct crisis
events.
All: The final dataset contains 1101 observations with 41 distinct crisis
events.
```

[3]:
```
# Specify Models to be tested
models = ["Logit", "KNeighbors", "RandomForest", "ExtraTrees", "SVM",␣
 ↪"NeuralNet"]

# Define Experiments for all Indicator Sets
ex_macro = Experiment(df_macro, models, "Forecast")
ex_financial = Experiment(df_financial, models, "Forecast")
ex_all = Experiment(df_all, models, "Forecast")
```

[5]:
```
ex_macro.run(disableTqdm = True)
ex_financial.run(disableTqdm = True)
ex_all.run(disableTqdm = True)

resCrossVal = pd.concat([ex_macro.auc, ex_financial.auc, ex_all.auc])
resCrossVal
```

[5]:

	Set	Model	AUC
0	Macro	SVM	0.646394
1	Macro	Logit	0.632278
2	Macro	NeuralNet	0.628676
3	Macro	KNeighbors	0.611879
4	Macro	ExtraTrees	0.544358
5	Macro	Random Assignment	0.500000
6	Macro	RandomForest	0.460333
0	Financial	SVM	0.854219
1	Financial	RandomForest	0.801076
2	Financial	ExtraTrees	0.797088
3	Financial	NeuralNet	0.775995
4	Financial	KNeighbors	0.764343
5	Financial	Logit	0.570488
6	Financial	Random Assignment	0.500000
0	All	ExtraTrees	0.751882
1	All	KNeighbors	0.745561
2	All	RandomForest	0.726115
3	All	SVM	0.706476
4	All	NeuralNet	0.630428
5	All	Logit	0.585312
6	All	Random Assignment	0.500000