Visualisations: Using Machine Learning to predict Financial Crises -

An Evaluation of different Learning Algorithms for Early Warning Models.

Author: Chris Reimann.

Date: 28.02.2023.

In [1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from prepareData import Data
```

Crisis Graph: MacroHistory

In [2]:
```
d1 = Data()
crisisYears = d1.df[d1.df.crisis == 1]
crisisYears = crisisYears[["year", "iso"]].sort_values("iso").reset_index(drop = True)
```

In [3]:
```
# Crisis Year Graph
sns.set_theme(style="whitegrid")
sns.set(rc={'savefig.dpi':300})
sns.stripplot(data = crisisYears, x = "year", y = "iso", size = 7, jitter = False)

plt.grid(axis = "y")
plt.xlabel("Year")
plt.ylabel("Country")

plt.xticks(fontsize = 12, rotation = 45)
plt.xticks(list(range(1870, 2021, 10)))

plt.savefig(r"C:\Users\c-rei\Pictures\crisisYears.png", bbox_inches='tight')
```

Crisis Graph: Laeven & Valencia

In [4]:
```
d2 = Data(crisisData = "LaevenValencia")
crisisYears = d2.df[d2.df.crisis == 1]
crisisYears = crisisYears[["year", "iso"]].sort_values("iso").reset_index(drop = True)
```

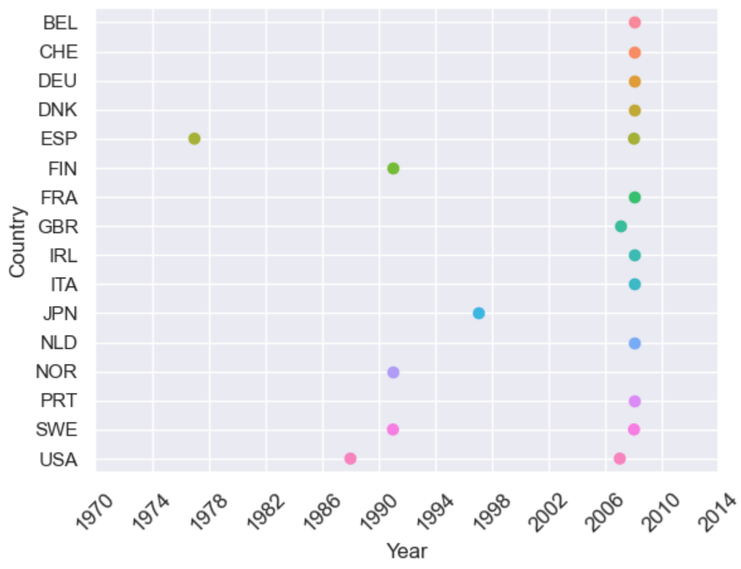
```
Yugoslavia, SFR not found in regex
```

In [5]:
```
# Crisis Year Graph
sns.set_theme(style="whitegrid")
sns.set(rc={'savefig.dpi':300})
sns.stripplot(data = crisisYears, x = "year", y = "iso", size = 7, jitter = False)

plt.grid(axis = "y")
plt.xlabel("Year")
plt.ylabel("Country")

plt.xticks(fontsize = 12, rotation = 45)
plt.xticks(list(range(1970, 2017, 4)))

plt.savefig(r"C:\Users\c-rei\Pictures\crisisYears_LV.png", bbox_inches='tight')
```



Crisis Graph: ESRB

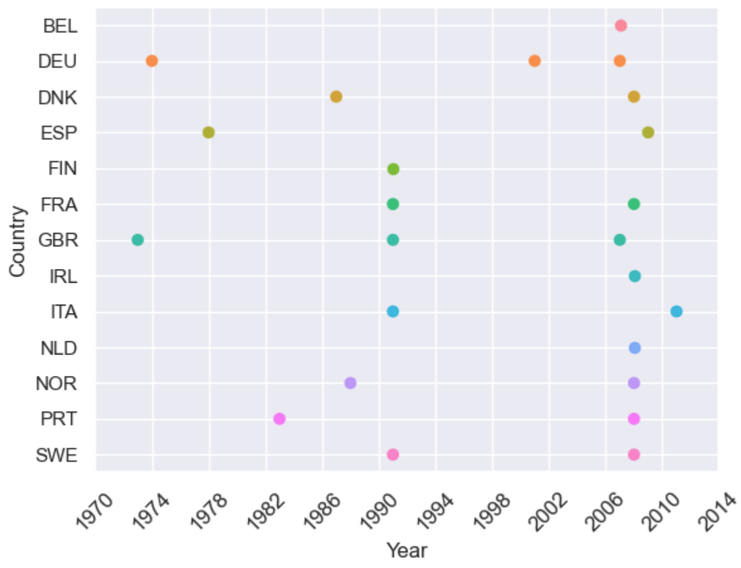
In [6]:
```
d3 = Data(crisisData = "ESRB")
crisisYears = d3.df[d3.df.crisis == 1]
crisisYears = crisisYears[["year", "iso"]].sort_values("iso").reset_index(drop = True)
```

In [7]:
```
# Crisis Year Graph
sns.set_theme(style="whitegrid")
sns.set(rc={'savefig.dpi':300})
sns.stripplot(data = crisisYears, x = "year", y = "iso", size = 7, jitter = False)

plt.grid(axis = "y")
plt.xlabel("Year")
plt.ylabel("Country")

plt.xticks(fontsize = 12, rotation = 45)
plt.xticks(list(range(1970, 2017, 4)))

plt.savefig(r"C:\Users\c-rei\Pictures\crisisYears_ESRB.png", bbox_inches='tight')
```



Model Overview

In [8]:
```
res = pd.read_excel("E:/University/M.A. Sozioökonomie/Masterarbeit/data/tidy/res.xlsx")
res_eKNN = res[res.Model != "KNN"]
```

In [9]:
```
sns.set(rc={'figure.figsize':(6,6)})
ax = sns.scatterplot(data = res, x = "in", y = "out", hue = "Model", style = "Indicators", s = 75)
plt.grid(axis = "x")
plt.xticks(fontsize = 12, rotation = 45)
plt.xlim(0.48,1.02)
plt.ylim(0.48,1.02)
sns.regplot(data = res_eKNN, x = "in", y = "out", scatter = False, ax=ax, ci = None, truncate = False, line_kws = {"dashes": (3,3)})
plt.xlabel("In-Sample AUROC")
plt.ylabel("Out-of-Sample AUROC")
sns.move_legend(ax, "upper left", bbox_to_anchor=(1, 1))
plt.savefig(r"C:\Users\c-rei\Pictures\modelOverview", bbox_inches='tight')
```


In [ ]:
```
```