Investigating the Potential of ML in Detecting Attractive Investments from Result and Balance Sheet Data

A case study on Swedish companies

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Background and rational

> Previous interesting research has been done on how machine learning can be applied to detect attractive investments

> However, these models are often built on data with restricted access

> Hence, it would be beneficial to explore the potential of an ML model only based on easily accessible data

> > E.g. financial figures from result and balance sheet data

> Sweden is a good case study for this purpose as companies are obliged to report financial figures from result and balance sheet to 'Skatteverket'[1]

Goals, hypothesis, research question and expected outcomes

> The goal is to explore the potential of machine learning models based on this data

> Hypothesis: Even tough other information and soft variables usually also goes into a investment decision, it can still help an investment decision

> Research question: Can an ML model only trained on result and balance sheet data, be valuable to determine attractive investments?

> Expected outcomes will be a comparison of different ML models on an investment decision task

Inspired by earlier papers and industry use cases, the research will leverage some well know ML methods

Theory and literature review

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ML in investment decisions

> Currently, most investors are not making use of ML technology yet
> Previous papers on area are limited but there are some researchers and companies looking into the possibilities
  > E.g. Arroyo et al. (2020) who found that investors currently do not have access to tools that allow them to reduce risk and uncertainty enough
  > E.g. Van Witteloostuijn and Kolkman (2019) who created a prediction model to estimate company growth
  > Example of industry use cases are Hone Capital[2] and EQT Motherbrain[3]

ML methods

> Multiple ML methods will be applied: decision tree, random forest, gradient boosting tree, K-nearest neighbor, support vector machine, and artificial neural network

Source: 2.McKinsey, 'A machine learning apprach to venture capital', 3. EQT Motherbraing web site

It will be an experimental study with an inductive and reductionist approach – equity column is used as proxy

Research methodology

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Tasks and research methods

> According to the reductionist approach, the research will be broken down into tasks
> > First, data exploration is necessary
> > Interesting variables for the models should be determined
> > Feature engineering will most likely be necessary
> > Machine learning models will be tested on the data
> > Insights will be evaluated and discussed
> The research is an experimental study with and an inductive approach - ML models will be applied to the observed dataset to draw potential conclusions

Method discussion

> Increase equity column as a proxy for investment received
> A hard assumption in this research is that investors would have a high success rate in finding attractive investments
> Thus, if a company saw an increase in their equity column, ergo received an investment, it will be seen as an attractive investment
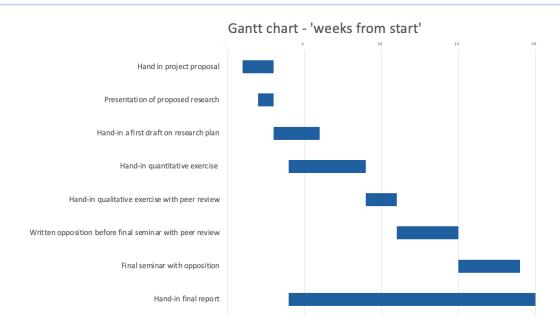> Of course this is not always the case, as investors also make unsuccessful investments

Various milestones will be taken into account

Milestones

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Gantt chart

Gantt chart - 'weeks from start'

	-	5	10	15	20
Hand in project proposal					
Presentation of proposed research					
Hand-in a first draft on research plan					
Hand-in quantitative exercise					
Hand-in qualitative exercise with peer review					
Written opposition before final seminar with peer review					
Final seminar with opposition					
Hand-in final report					