2019.5.7

Overview

Basic Conception

Stochastic Discount Factor in Asset Pricing

- What is the Stochastic Discount Factor(SDF)?
- Implementation in finance area: By No-Arbitrage Pricing Theory, Stochastic Discount Factor(SDF) explains why the different expected returns come from different assets

Challenges:

- SDF includes all avaliable economic information
- The function form of SDF is unknown and complicated
- SDF needs to capture time-variation in economic conditions
- Risk premium in stock return has a low signal-to-noise ratio

Basic Conception

Goals of this project

- Using deep neural networks to estimate SDF function, generate non-linear pricing model, and construct a optimal portfolio

Contribution

- Empirically outperforms all benchmark models
- Optimal portfolio has out-of-sample Sharp ratio of XXXX
- Take into account non-linearities and interaction between firm information
- Most relevant firm characteristics are price trends, profitability, and capital structure variables.

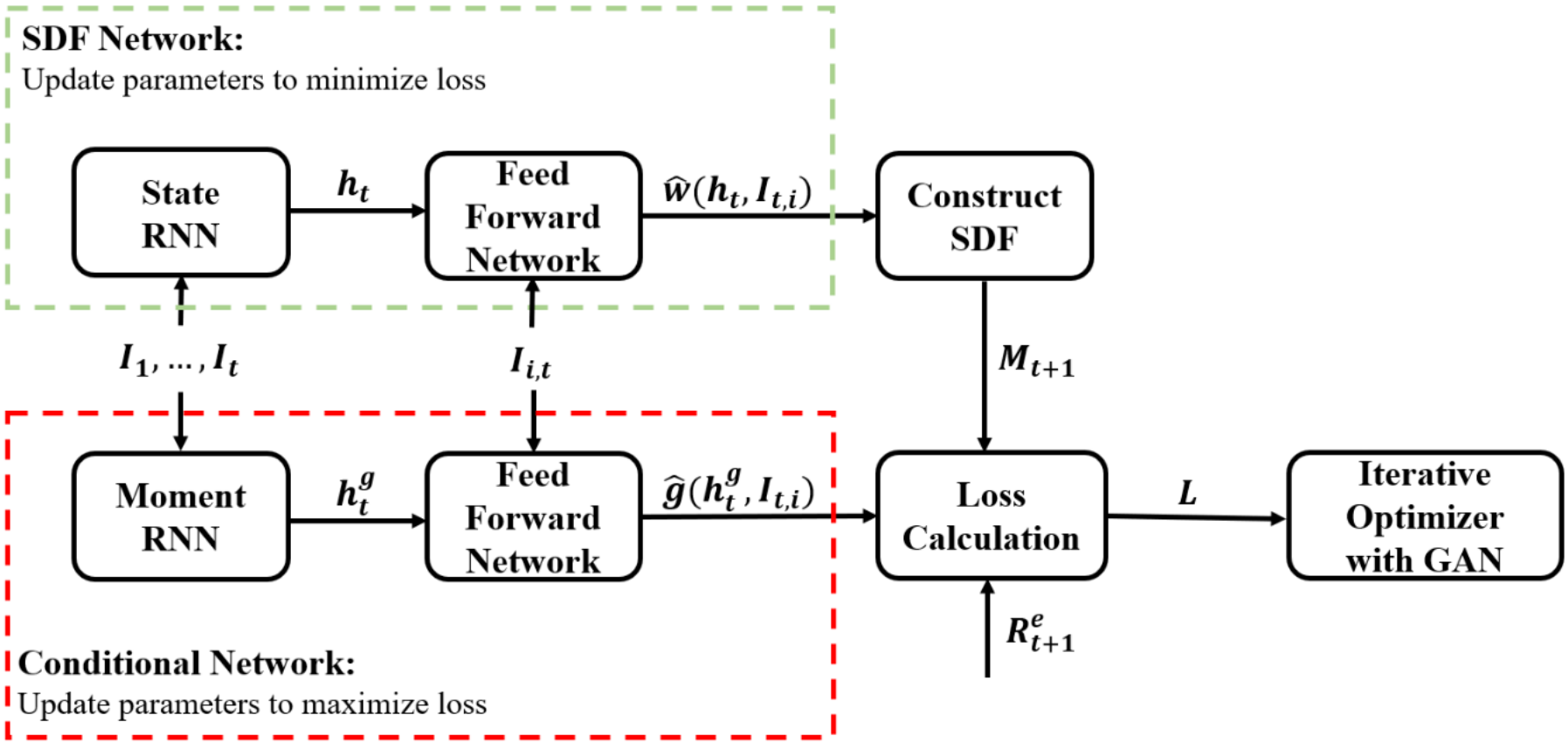
Models


training set backtest
sdf
benchmark
8
7
6
5
4
3
2
1
0
250
500
750
1000
1250
1500
1750

Models

Model Architecture:

architecture.png architecture.png

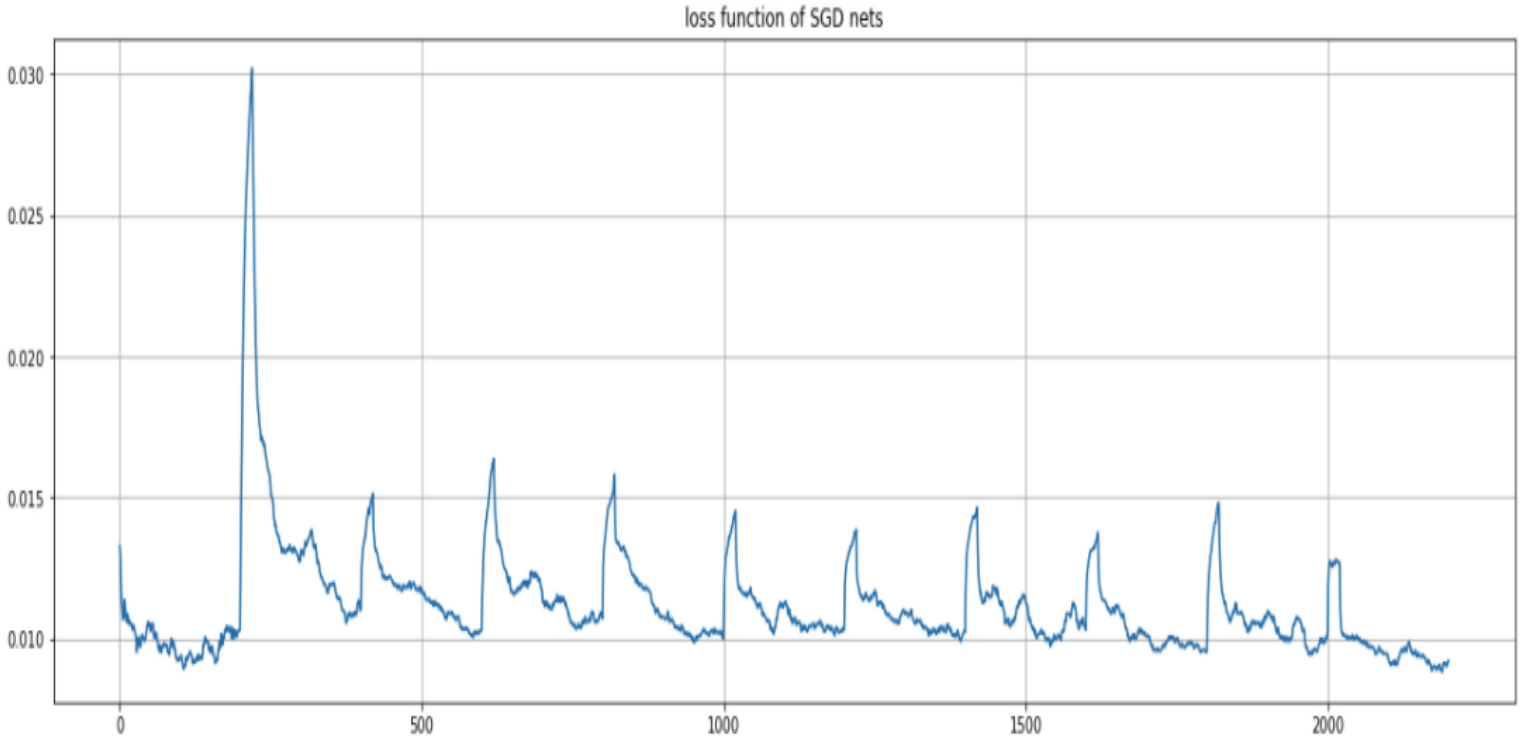


Data

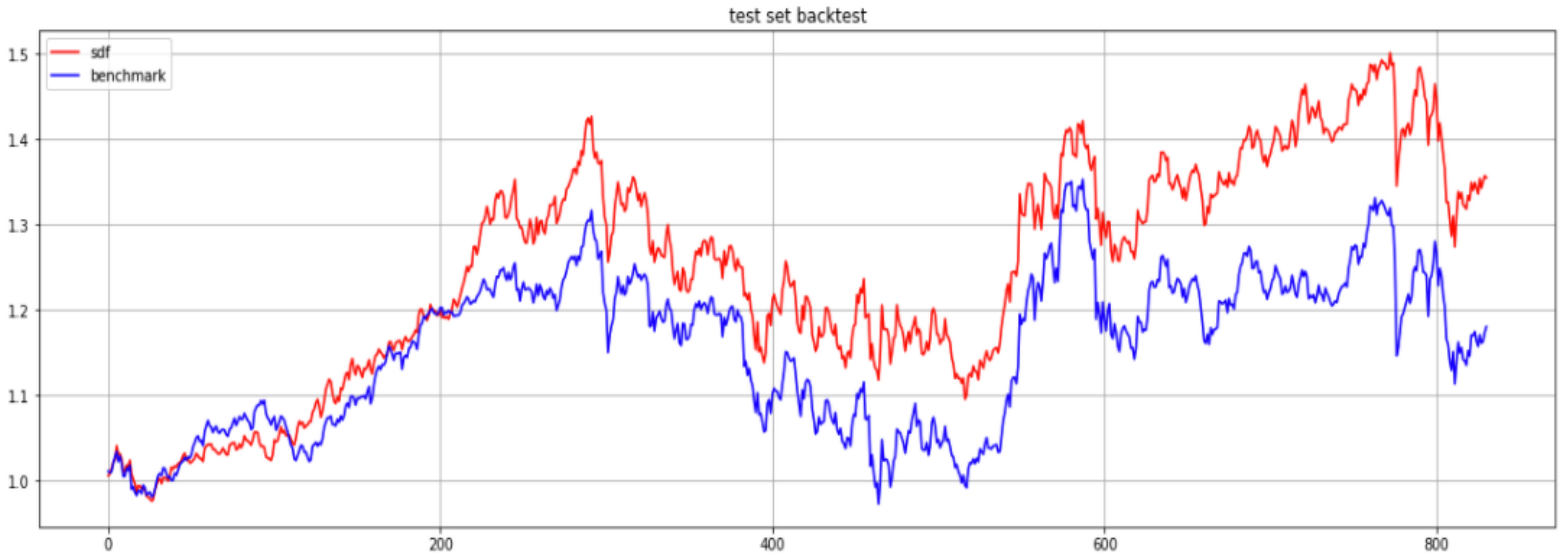
Macro_data		Micro_data	
GDP		**Valuation**	P/S、P/E
Industry	CPI、RPI、PPI	**Risk**	Beta
Import and Export		**Profitability**	ROA、ROE
Consumption		**Revenue quality**	Operating income
Investment		**Capital Structure**	Debt Asset ratio
Rate & Monetary	M0、Exchange Rate、Loan Rate	**Solvency**	Operating profit/Liability
Fiscal	Fiscal Revenue & Fiscal Expenditure	**Operating Capacity**	Total Assets Turnover
Employment & Salary	Employment rate、Average Salary Level	**Cash Flow**	FCFF

From Wind database, acquire macroeconomic data and firm-specific data since 20070101 up to now. Re-sample and normalize to construct input for our model.

Empirical Results



Empirical Results



Conclusion

Models	**SR 1**	**SR 2**
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table Table caption

References

Luyang Chen, Markus Pelger, Jason Zhu (2019)

Deep Learning in Asset Pricing(December 4, 2019), Stanford University

Available at SSRN: https://ssrn.com/abstract=3350138 or http://dx.doi.org/10.2139/ssrn.3350138

Conclusion

Thanks for listening