

## Optimizing the Sharpe Ratio for a Rank-Based Trading System

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## **How About Predicting Ranks?**

Task : For each stock m, find a model  $g_m$  that predicts h days ahead:

$$\hat{A}_h^m(t+h) = g_m(I_t)$$

where  $I_t$  is the information available at time *t*.

Let's try the previous values of the ranks themselves as inputs:

 $\hat{A}_{h}^{m}(t+h) = g_{m}(A_{1}^{m}(t), A_{2}^{m}(t), A_{5}^{m}(t), A_{20}^{m}(t))$ 







Results from	Table 1: 1-day predictions of 1-day ranks $ \hat{A}_1(t+1) >0.00$						
Time Series	Year:	93	94	95	96	97	93-97
	$Hitrate_+$	51.1	53.4	53.3	53.0	52.5	(52.7)
Predictions of	$Hitrate_{-}$	51.8	53.6	53.4	53.2	52.6	52.9
	Return <sub>+</sub>	0.389	0.101	0.155	0.238	0.172	0.212
Ranks	Return_	0.253	-0.176	-0.094	0.057	0.008	0.010
	#Pred+	7719	8321	8313	8923	8160	41510
	#Pred_	15505	8343	8342	17866	8172	83174
	1.100	10000	1	10000	1.500	20302	00311
predictable !	Selected predictions We select the extreme rank predictions: Table 2: 1-day predictions of 1-day ranks $ \hat{A}_1(t+1)  > 0.49$						
Olevelfic and hit rates	Hitrate .	59.7	65.1	67.9	66.7	61.2	642
Significant filt rate:—	Hitrate_	52.7	53.2	56.4	59.4	56.7	55.7
Good senaration	Return <sub>+</sub>	1.468	0.583	0.888	0.770	0.745	0.895
	Return_	1.138	-0.236	-0.402	-0.040	-0.055	0.085
for the positive and	$#Pred_+$	211	215	218	228	214	1088
ier alle pesitivo alla	#Pred_	222	220	220	234	217	1115
negative predictions	#Pred	15505	10664	16655	17866	16332	83174







## Conclusions \*\* Both profits and Sharpe ratios for the rank-based trading are higher than for the benchmark stock index \*\* The technique scales linearly with the number of assets (important) \*\* Non linear techniques (multi layer perceptrons) could improve the results even further (?) Mean annual profit % Year: 93 94 95 96 97 Med Total Profit 120.8 116.1 142.9 165.8 100.8 129.4 6102 Index profit 52.1 4.6 18.3 38.2 23.8 27.4 222 Diff. 63.7 112.2 124.6 112.7.7 76.9 102.0 5880 # trades 640 700 770 671 697 3487 Sharpe 1.7 2.4 3.2 4.5 3.1 3.0 Index sharpe 2.8 0.1 1.4 2.4 1.4 1.6



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