

Bibliography

- [1] ATSALAKIS, G. S.; VALAVANIS, K. P. **Surveying Stock Market Forecasting Techniques - Part II: Soft Computing Methods.** *Expert Systems with Applications*, 36, 3, 5932–5941, 2009.
- [2] MARTINEZ, L. C.; DA HORA, D. N.; PALOTTI, J. R. M.; PAPPA, G. L.; MEIRA JR., W. **From an Artificial Neural Network to a Stock Market Day-trading System: a Case Study on the BM&F bovespa.** *International Joint Conference on Neural Networks*, 3251–3258, 2009.
- [3] ABU-MOSTAFA, Y. S.; ATIYA, A. F. **Introduction to Financial Forecasting.** *Applied Intelligence*, 6, 3, 205–213, 1996.
- [4] LAWRENCE, R.. **Using Neural Networks to Forecast Stock Market Prices.** *Department of Computer Science, University of Manitoba*, 1997.
- [5] VANSTONE, B.; FINNIE, G.. **An Empirical Methodology for Developing Stockmarket Trading Systems Using Artificial Neural Networks.** *Expert Systems with Applications*, 36, 3, 6668–6680, 2009.
- [6] ZOMAYA, A. Y.; ANDERSON, J. A.; FOGEL, D. B.; MILBURN, G. J.; ROZENBERG, G.. Grzegorz Rozenberg. **Nonconventional Computing Paradigms in the New Millenium: a Roundtable.** *Computing in Science and Engineering*, 3, 6, 82–99, 2001.
- [7] ALVIM, L. G. M.; MILIDIÚ, R. L.; DOS SANTOS, C. N.. **Daily Volume Forecasting Using High-frequency Predictors.** *IASTED - International Conference on Artificial Intelligence and Applications*, 2010.
- [8] CHOUDHRY, R.; GARG, K.. **A Hybrid Machine Learning System for Stock Market Forecasting.** *WASET - World Academy of Science, Engineering and Technology*, 39, 315–318, 2005.
- [9] HUANG, W.; NAKAMORI, Y.; WANG, S.. **Forecasting Stock Market Movement Direction with Support Vector Machine.** *Computers and Operations Research*, 32, 10, 2513–2522, 2005.

- [10] TANG, L.; TANG, L.; SHENG, H.. **Forecasting Volatility Based on Wavelet Support Vector Machine.** *Expert Systems with Applications*, 36(2):2901–2909, 2009.
- [11] GOMIDE, P.; MILIDIÚ, R. L.. **Assessing Stock Market Time Series Predictors Quality Through a Pairs Trading System.** *Brazilian Symposium on Neural Networks*, 133–139, 2010.
- [12] ABRAHAM, A.; NATH, B.; MAHANTI, P. K.. **Hybrid Intelligent Systems for Stock Market Analysis.** *International Conference on Computational Science*, 337–345, 2001.
- [13] CHANG, P.; LIU, C.; LIN, J.; FAN, C.; NG, C. S. P.. **A Neural Network with a Case Based Dynamic Window for Stock Trading Prediction.** *Expert Systems with Applications*, 36, 3, 6889–6898, 2009.
- [14] CHUNG, F.; FU, T.; NG, V. T. Y.; LUK, R. W. P.. **An Evolutionary Approach to Pattern-based Time Series Segmentation.** *IEEE Transactions on Evolutionary Computation*, 8, 5, 471–489, 2004.
- [15] KIM, H.; SHIN, K.. **A Hybrid Approach Based on Neural Networks and Genetic Algorithms for Detecting Temporal Patterns in Stock Markets.** *Applied Soft Computing*, 7, 2, 569–576, 2007.
- [16] KOULOURIOTIS, D. E.; DIAKOULAKIS, I. E.; EMIRIS, D. M.; ZOPOUNIDIS, C.. **Development of Dynamic Cognitive Networks as Complex Systems Approximators: Validation in Financial Time Series.** *Applied Soft Computing*, 5, 2, 157–179, 2005.
- [17] NEOCLEOUS, C. C.; ANDREOU, A. S.; SCHIZAS, C. N.; TOUMPOURIS, C.. **Testing the Predictability of the Cyprus Stock Exchange: the Case of an Emerging Market.** *International Joint Conference on Neural Networks*, 360–365, 2000.
- [18] RAPOSO, R. DE C. T.; CRUZ, A. J. DE O.; MENDES, S.; DA SILVA, F. C.; DE COSTA, F. M. G.; FARIAS, J. M.; SILVA, P. S. A.; LUIZ, A.; DO NASCIMENTO, W. O.. **Using Multi-agents to Predict the Stock Market Evolution Based on Fundamental Analysis and Fuzzy-neural Networks.** *WSEAS International Conference on Applied Informatics and Communications, World Scientific and Engineering Academy and Society*, 391–396, 2005.
- [19] SCHÖNEBURG, E.. **Stock Price Prediction Using Neural Networks: a Project Report.** *Neurocomputing*, 2, 1, 17–27, 1990.

- [20] THAWORNWONG, S.; ENKE, D.. **The Adaptive Selection of Financial and Economic Variables for Use with Artificial Neural Networks.** *Neurocomputing*, 56, 205–232, 2004.
- [21] ZHANG, D.; JIANG, Q.; LI, X.. **Application of Neural Networks in Financial Data Mining.** *IASTED - International Conference on Computational Intelligence*, 392–395, 2004.
- [22] VIDYAMURTHY, G.. **Pairs Trading: Quantitative Methods and Analysis.** *Wiley Finance*, 2004.
- [23] Finder Pairtrade Professional Stock Trading Software. **Layman’s Guide to Pair trading.** *Pairtrade Finder Homepage*. 2008. www.pairtrade-finder.com/pairTrading.pdf
- [24] YUDONG, Z.; LENAN, W.. **Stock Market Prediction of S&P 500 Via Combination of Improved BCO Approach and BP Neural Network.** *Expert Systems with Applications*, 36, 5, 8849–8854, 2009.
- [25] TAN, C. N. W.. **Artificial Neural Networks: Applications in Financial Distress Prediction and Foreign Exchange Trading.** *Wilberto Press: Gold Coast, QLD*, 2001.
- [26] CANASSA, H.; ORTEGA, E.. **Bovespa-BM&F Merger to Create Third-biggest Exchange.** *Bloomberg Homepage*. 2008. <http://www.bloomberg.com/apps/news?pid=20601086&sid=abthmx9gugwa&refer=news>
- [27] O’CONNOR, N.; MADDEN, M. G.. **A Neural Network Approach to Predicting Stock Exchange Movements Using External Factors.** *Knowledge Based Systems*, 19, 5, 371–378, 2006.
- [28] HUANG, C.; TSAI, C.. **A Hybrid SOFM-SVR with a Filter-based Feature Selection for Stock Market Forecasting.** *Expert Systems with Applications*, 36, 2, 1529–1539, 2009.
- [29] YANG, H.; CHAN, L.; KING, I.. **Support Vector Machine Regression for Volatile Stock Market Prediction.** *IDEAL - International Conference on Intelligent Data Engineering and Automated Learning*, 391–396, 2002.
- [30] ARMANO, G.; MARCHESI, M.; MURRU, A.. **A Hybrid Genetic-neural Architecture for Stock Indexes Forecasting.** *Information Sciences*, 170, 1, 3–33, 2005.

- [31] DONG, I.; DUAN, C.; JANG, M.. **Predicting Extreme Stock Performance More Accurately.** *Government 2001*, 2001.
- [32] DARBY, S. C.; REISSLAND, J. A.. **Low Levels of Ionizing Radiation and Cancer - Are We Underestimating the Risk?** *Journal of the Royal Statistical Society, Series A*, 144, 298–331, 1981.
- [33] LEE, C. C.. **The Min-max Algorithm and Isotonic Regression.** *The Annals of Statistics*, 11, 2, 467–477, 1983.
- [34] **Algorithmic Trading, Ahead of the Tape.** *The Economist Homepage*, The Economist 383, 2007.
<http://www.economist.com/node/9370718>
- [35] RENTERÍA, R. P.; MILIDIÚ, R. L.. **Algoritmos para Regressão por Mínimos Quadrados Parciais.** *PhD Thesis, Pontifícia Universidade Católica do Rio de Janeiro*, 2003.
- [36] BISHOP, C. M.. **Pattern Recognition and Machine Learning.** *Information Science and Statistics*, 2006.
- [37] WOLD, S.; ALBANO, C.; DUNN III, W. J.; ESBENSEN, K.; HELLBERG, S.; JOHANSSON, E.; SJÖSTRÖM H.. **Pattern Recognition: Finding and Using Regularities in Multivariate Data** *IUFOST Conference on Food Research and Data Analysis*, Applied Science Publishers, 147–188, 1983.
- [38] WOLD, S.; MARTENS, L.; WOLD, H.. **The Multivariate Calibration Problem in Chemistry Solved by the PLS Method.** *Conference Matrix Pencils*, 286–293, 1983.
- [39] TENENHAUS, M.; MORINEAU, A.. **PLS and Multivariate Additive Spline Modeling.** *Les méthodes PLS, PLS International Symposium*, 1–20, 1999.
- [40] TENENHAUS, M.. **PIS Generalized Linear Regression. Application to the Analysis of Life Time Data.** *PLS and Related Methods, PLS International Symposium*, 131–140, 2001.
- [41] HAALAND, D. M.; THOMAS, E. V.. **Partial Least-Squares Methods for Spectral Analyses. 1. Relation to Other Quantitative Calibration Methods and the Extraction of Qualitative Information.** *Analytical Chemistry*, 60, i11, 1193–1202, 1988.

- [42] HAALAND, D. M.; THOMAS, E. V.. **Partial Least-Squares Methods for Spectral Analyses. 2. Application of Simulated and Glass Spectral Data.** *Analytical Chemistry*, 60, i11, 1202–1208, 1988.
- [43] TENENHAUS, M.. **La Régression PLS: Théorie et Pratique.** *Éditions Technip*, 1998.
- [44] VAPNIK, V.; LERNER, A.. **Pattern Recognition Using Generalized Portrait Method.** *Automation and Remote Control*, 24, 774–780, 1963.
- [45] VAPNIK, V.; CHERVONENKIS, A.. **A Note on One Class of Perceptrons.** *Automation and Remote Control*, 25, 1964.
- [46] BOSER, B. E.; GUYON, I. M.; VAPNIK, V. N.. **A Training Algorithm for Optimal Margin Classifiers.** *COLT - Annual Workshop on Computational Learning Theory*, 144–152, 1992.
- [47] GUYON, I.; BOSER, B.; VAPNIK, V.. **Automatic Capacity Tuning of Very Large VC-Dimension Classifiers.** *Advances in Neural Information Processing Systems*, 147–155, 1993.
- [48] CORTES, C.; VAPNIK, V.. **Support-vector Networks.** *Machine Learning*, 20, 273–297, 1995.
- [49] SCHÖLKOPF, B.; BURGESS, C.; VAPNIK, V.. **Extracting Support Data for a Given Task.** *International Conference on Knowledge Discovery & Data Mining*, 252–257, 1995.
- [50] SCHÖLKOPF, B.; BURGESS, C.; VAPNIK, V.. **Incorporating Invariances in Support Vector Learning Machines.** *ICANN - International Conference on Artificial Neural Networks*, Lecture Notes in Computer Science, 1112, 47–52, 1996.
- [51] VAPNIK, V.; GOLOWICH, S. E.; SMOLA, A.. **Support Vector Method for Function Approximation, Regression Estimation, and Signal Processing.** *Advances in Neural Information Processing Systems*, 9, 281–287, 1996.
- [52] SMOLA, A. J.; SCHÖLKOPF, B.. **A Tutorial on Support Vector Regression.** *Technical report, STATISTICS AND COMPUTING*, 2003.
- [53] SCHÖLKOPF, B.; SIMARD, P. Y.; SMOLA, A. J.; VAPNIK, V. N.. **Prior Knowledge in Support Vector Kernels.** *Advances in Neural Information Processings Systems*, 10, 640–646, 1998.

- [54] BLANZ, V.; SCHÖLKOPF, B.; BÜLTHOFF, H. H.; BURGES, C.; VAPNIK, V.; VETTER, T.. **Comparison of View-Based Object Recognition Algorithms Using Realistic 3D Models.** *ICANN - International Conference on Artificial Neural Networks*, 251–256, 1996.
- [55] SCHÖLKOPF, B.. **Support Vector Learning Tutorial.** *DAGM - Deutsche Arbeitsgemeinschaft für Mustererkennung, Symposium for Pattern Recognition*, 1999.
- [56] MÜLLER, K. R.; SMOLA, A.; RÄTSCH, G.; SCHÖLKOPF, B.; KOHLMORGEN, J.; VAPNIK, V.. **Predicting Time Series with Support Vector Machines.** *ICANN - International Conference on Artificial Neural Networks, Lecture Notes in Computer Science*, 999–1004, 1997. *Advances in Kernel Methods — Support Vector Learning*, 243–254, 1999.
- [57] DRUCKER, H.; BURGES, C. J. C.; KAUFMAN, L.; SMOLA, A.; VAPNIK, V.. **Support Vector Regression Machines.** *Advances in Neural Information Processing Systems*, 9, 155–161, 1997.
- [58] STITSON, M.; GAMMERMAN, A.; VAPNIK, V.; VOVK, V.; WATKINS, C.; WESTON, J.. **Support Vector Regression with Anova Decomposition Kernels.** *Advances in Kernel Methods — Support Vector Learning*, 285–292, 1999.
- [59] MATTERA, D.; HAYKIN, S.. **Support Vector Machines for Dynamic Reconstruction of a Chaotic System.** *Advances in Kernel Methods — Support Vector Learning*, 211–242, 1999.
- [60] CHANG, C.; LIN, C.. **LIBSVM: a Library for Support Vector Machines.** Software Available at *LIBSVM Homepage*, 2001. <http://www.csie.ntu.edu.tw/~cjlin/libsvm>
- [61] VAPNIK, V.. **The Nature of Statistical Learning Theory.** *Springer-Verlag, New York*, 1995.
- [62] BENNETT, K. P.; MANGASARIAN, O. L.. **Robust Linear Programming Discrimination of Two Linearly Inseparable Sets.** *Optimization Methods and Software*, 1, 23–34, 1992.
- [63] LEE, Y. J.; MANGASARIAN, O. L.. **SSVM: A Smooth Support Vector Machine for Classification.** *Technical Report, University of Wisconsin, Data Mining Institute*, 1999.

- [64] LEE, Y.; MANGASARIAN, O. L.. **SSVM: A Smooth Support Vector Machine for Classification**. *Computational Optimization and Applications*, 20:5–22, October 2001.
- [65] FLETCHER, R.. **Practical Methods of Optimization**. John Wiley and Sons, New York, 1987.
- [66] AIZERMAN, M. A.; BRAVERMAN, E. A.; ROZONOER, L.. **Theoretical Foundations of the Potential Function Method in Pattern Recognition Learning**. *Automation and Remote Control*, 25:821–837, June 1964.
- [67] NILSSON, N. J.. **Learning Machines: Foundations of Trainable Pattern Classifying Systems**. McGraw-Hill, 1965.
- [68] BOSER, B. E.; GUYON, I. M.; VAPNIK, V. N.. **A Training Algorithm for Optimal Margin Classifiers**. *Proceedings of the Fifth Annual Workshop on Computational Learning Theory, COLT '92*, 144–152, New York, NY, USA, 1992. ACM.
- [69] MANGASARIAN, O. L.. **Nonlinear Programming**. McGraw-Hill, New York, 1969.
- [70] MCCORMICK, G. P.. **Nonlinear Programming: Theory, Algorithms, and Applications**. John Wiley & Sons, Inc., New York, NY, USA, 1983.
- [71] VANDERBEI, R. J.. **LOQO: An Interior Point Code for Quadratic Programming**. *Optimization Methods and Software*, 12, 451–484, 1999.
- [72] MCCULLOCH, W. S.; PITTS, W.. **A Logical Calculus of the Ideas Immanent in Nervous Activity**. *Bulletin of Mathematical Biophysics*, 5(4):115–133, 1943.
- [73] BOURG, D. M.; SEEMANN, G.. **AI for Game Developers**. *O'Reilly Media*, 2004.
- [74] CHANDE, T. S.. **Beyond Technical Analysis: How to Develop and Implement a Winning Trading System**. *Wiley Trading*, 1999.
- [75] *XP Investimentos Homepage*. 2011. http://www.xpi.com.br/clientes_institucionais_eng.aspx
- [76] AYOB, M.; NASRUDIN, M. F.; OMAR, K.; SURIP, M.. **The Effects of Returns Function on Individual Stock Price (klse) Prediction Model Using Neural Networks**. *ICAI - International Conference on Artificial Intelligence*, 409–415, 2001.

- [77] CHANDRA, N.; REEB, D. M.. **Neural Networks in a Market Efficiency Context.** *American Business Review*, 17, 39–44, 1999.
- [78] KIRKPATRICK, C.; DAHLQUIST, J.. **Technical Analysis: the Complete Resource for Financial Market Technicians.** *FT Press*, 2006.
- [79] BREALEY, R.; MYERS, S.. **Principles of Corporate Finance.** *Mcgraw-Hill Book Company*, 1988.
- [80] MITCHEM, A. L.. **Risking America's Return On Investment.** *Forbes Homepage*. 2010. <http://www.forbes.com/2010/01/26/education-government-roi-leadership-thought-leaders-mitchem.html>
- [81] *Petrobras Homepage*. 2011. http://www.petrobras.com/ptcm/appmanager/ptcm/dptcm?_nfpb=true&_pageLabel=petr_com_conheca_empresa
- [82] **Petrobras Largest Company in Latin America.** *Latin Business Chronicle Homepage*. 2009. <http://www.latinbusinesschronicle.com/app/article.aspx?id=3440>
- [83] **A Marcha Gigante para a Auto-suficiência em 2005.** *Hora do Povo Homepage*. 2006. <http://www.horadopovo.com.br/2006/dezembro/05-12-06/pag3-petro-a.htm>
- [84] *Usiminas Homepage*. 2011. <http://eng.usiminas.com/irj/porta1?>
- [85] *Gerdau Group Homepage*. 2011. <http://www.gerdau.com/home/Default.aspx>
- [86] *Bradesco Homepage*. 2011. <http://www.bradesco.com.br/site/conteudo/home/default.aspx?idiomaId=2>
- [87] *Bradespar Homepage*. 2011. <http://www.bradespar.com.br/>

A Sample of “Trades Report”

This report refers to an interday forecasting to the Pair Trading USIM5 x GGBR4, provided by PLSR predictor. To avoid the generation of very large reports, the experiment presents a test period of only 10 trading days, which falls between May 3th 2010 and May 14th 2010. Its corresponding Summary Report is shown in appendix B.

Trades Report											

Predictor		=	PLSR								
Forecasting Scheme		=	Interday								
Trading Concerned		=	Pairs Trading								
Considered Stock(s)		=	USIM5 x GGBR4								
Training Period Begin Date		=	29/12/2008								
Training Period End Date		=	29/04/2010								
Validation Period Begin Date		=	30/04/2010								
Validation Period End Date		=	30/04/2010								
Test Period Begin Date		=	03/05/2010								
Test Period End Date		=	14/05/2010								

Date	Time	Stock	TrTp	Amount	Price	BrkRat	StMRat	TotRat	Cash_Befr	Cash_Blc	Cash_Aft
03/05/10	11:46	gibr4	C(0)	7100(100.00%)	27.87	-15.77	-68.26	-84.03	200000.00	-197961.03	2038.97
03/05/10	11:46	usim5	V(0)	-3500(100.00%)	55.77	-15.77	-67.34	-83.11	200000.00	195111.89	395111.89
03/05/10	16:54	gibr4	V(3)	-7100(100.00%)	27.92	-15.77	-68.38	-84.15	197150.86	198147.85	395298.71
03/05/10	16:54	usim5	C(3)	3500(100.00%)	55.19	-15.77	-66.63	-82.40	395298.71	-193247.40	202051.31
Current Date Raw Cash Balance		=	R\$2030.80								
Current Date Withholding Income Tax Cost		=	-R\$20.51								
Current Date Net Cash Balance		=	R\$1641.05								
Current Date Income Tax Cost		=	-R\$389.75								
Raw Cash After This Date		=	R\$202030.80								
Net Cash After This Date		=	R\$201641.05								
Current Date Raw Rentability Balance		=	1.02%								
Current Date Net Rentability Balance		=	0.82%								
Raw Rentability After This Date		=	1.02%								
Net Rentability After This Date		=	0.82%								

04/05/10	10:37	gibr4	C(0)	7300(100.00%)	27.38	-15.77	-68.95	-84.72	202030.80	-199958.72	2072.07
04/05/10	10:37	usim5	V(0)	-3700(100.00%)	54.54	-15.77	-69.61	-85.38	202030.80	201712.62	403743.41
04/05/10	16:54	gibr4	V(3)	-7300(100.00%)	26.82	-15.77	-67.53	-83.30	203784.70	195702.70	399487.39
04/05/10	16:54	usim5	C(3)	3700(100.00%)	53.65	-15.77	-68.48	-84.25	399487.40	-198589.25	200898.14
Current Date Raw Cash Balance		=	-R\$1163.88								
Current Date Withholding Income Tax Cost		=	-R\$31.23								
Current Date Net Cash Balance		=	-R\$906.12								
Current Date Income Tax Cost		=	R\$0.00								
Raw Cash After This Date		=	R\$200866.91								
Net Cash After This Date		=	R\$200734.93								
Current Date Raw Rentability Balance		=	-0.58%								
Current Date Net Rentability Balance		=	-0.45%								
Raw Rentability After This Date		=	0.43%								
Net Rentability After This Date		=	0.37%								

05/05/10 10:30 ggbr4 C(0) 7600(100.00%)	26.27	-15.77	-68.87	-84.64	200866.91	-199736.64	1130.27	
05/05/10 10:30 usim5 V(0) -3700(100.00%)	52.89	-15.77	-67.51	-83.28	200866.91	195609.72	396476.63	
05/05/10 16:54 ggbr4 V(3) -7600(100.00%)	27.08	-15.77	-70.99	-86.76	196739.99	205721.24	402461.23	
05/05/10 16:54 usim5 C(3) 3700(100.00%)	53.07	-15.77	-67.74	-83.51	402461.23	-196442.51	206018.72	
Current Date Raw Cash Balance	=	R\$5091.96						
Current Date Withholding Income Tax Cost	=	-R\$59.85						
Current Date Net Cash Balance	=	R\$4121.45						
Current Date Income Tax Cost	=	-R\$970.52						
Raw Cash After This Date	=	R\$205958.88						
Net Cash After This Date	=	R\$204856.38						
Current Date Raw Rentability Balance	=	2.53%						
Current Date Net Rentability Balance	=	2.05%						
Raw Rentability After This Date	=	2.98%						
Net Rentability After This Date	=	2.43%						

06/05/10 15:46 ggbr4 C(0) 8200(100.00%)	24.91	-15.77	-70.46	-86.23	205958.88	-204348.23	1610.64	
06/05/10 15:46 usim5 V(0) -4100(100.00%)	49.80	-15.77	-70.44	-86.21	205958.88	204093.79	410052.66	
06/05/10 16:54 ggbr4 V(3) -8200(100.00%)	26.82	-15.77	-75.86	-91.63	205704.44	219832.37	425536.80	
06/05/10 16:54 usim5 C(3) 4100(100.00%)	51.50	-15.77	-72.83	-88.60	425536.81	-211238.60	214298.20	
Current Date Raw Cash Balance	=	R\$8184.49						
Current Date Withholding Income Tax Cost	=	-R\$154.84						
Current Date Net Cash Balance	=	R\$6671.46						
Current Date Income Tax Cost	=	-R\$1513.02						
Raw Cash After This Date	=	R\$214143.37						
Net Cash After This Date	=	R\$211527.84						
Current Date Raw Rentability Balance	=	3.97%						
Current Date Net Rentability Balance	=	3.26%						
Raw Rentability After This Date	=	7.07%						
Net Rentability After This Date	=	5.76%						

10/05/10 10:22 ggbr4 C(0) 7800(100.00%)	27.44	-15.77	-73.83	-89.60	214143.37	-214121.60	21.76	
10/05/10 10:22 usim5 V(0) -4000(100.00%)	53.14	-15.77	-73.32	-89.09	214143.37	212470.91	426614.27	
10/05/10 16:54 ggbr4 V(3) -7800(100.00%)	26.91	-15.77	-72.41	-88.18	212492.68	209809.82	422302.49	
10/05/10 16:54 usim5 C(3) 4000(100.00%)	53.25	-15.77	-73.48	-89.25	422302.50	-213089.25	209213.24	
Current Date Raw Cash Balance	=	-R\$4930.12						
Current Date Withholding Income Tax Cost	=	R\$0.00						
Current Date Net Cash Balance	=	-R\$3944.10						
Current Date Income Tax Cost	=	R\$0.00						
Raw Cash After This Date	=	R\$209213.25						
Net Cash After This Date	=	R\$207583.74						
Current Date Raw Rentability Balance	=	-2.30%						
Current Date Net Rentability Balance	=	-1.86%						
Raw Rentability After This Date	=	4.61%						
Net Rentability After This Date	=	3.79%						

11/05/10 10:05 ggbr4 C(0) 7900(100.00%)	26.44	-15.77	-72.05	-87.82	209213.25	-208963.82	249.42	
11/05/10 10:05 usim5 V(0) -3900(100.00%)	52.44	-15.77	-70.55	-86.32	209213.25	204429.68	413642.92	
11/05/10 16:54 ggbr4 V(3) -7900(100.00%)	26.30	-15.77	-71.67	-87.44	204679.11	207682.56	412361.66	
11/05/10 16:54 usim5 C(3) 3900(100.00%)	52.75	-15.77	-70.97	-86.74	412361.67	-205811.74	206549.92	
Current Date Raw Cash Balance	=	-R\$2663.32						
Current Date Withholding Income Tax Cost	=	R\$0.00						
Current Date Net Cash Balance	=	-R\$2130.66						
Current Date Income Tax Cost	=	R\$0.00						
Raw Cash After This Date	=	R\$206549.93						
Net Cash After This Date	=	R\$205453.09						
Current Date Raw Rentability Balance	=	-1.27%						
Current Date Net Rentability Balance	=	-1.03%						
Raw Rentability After This Date	=	3.27%						
Net Rentability After This Date	=	2.73%						

12/05/10 10:16 ggbr4 C(0) 7700(100.00%)	26.53	-15.77	-70.47	-86.24	206549.93	-204367.24	2182.68	
12/05/10 10:16 usim5 V(0) -3800(100.00%)	53.03	-15.77	-69.52	-85.29	206549.93	201428.71	407978.63	
12/05/10 16:54 ggbr4 V(3) -7700(100.00%)	26.75	-15.77	-71.05	-86.82	203611.40	205888.18	409499.57	
12/05/10 16:54 usim5 C(3) 3800(100.00%)	53.07	-15.77	-69.56	-85.33	409499.58	-201751.33	207748.24	
Current Date Raw Cash Balance	=	R\$1183.11						
Current Date Withholding Income Tax Cost	=	-R\$15.21						
Current Date Net Cash Balance	=	R\$958.66						
Current Date Income Tax Cost	=	-R\$224.45						
Raw Cash After This Date	=	R\$207733.04						
Net Cash After This Date	=	R\$206411.74						
Current Date Raw Rentability Balance	=	0.57%						
Current Date Net Rentability Balance	=	0.47%						
Raw Rentability After This Date	=	3.87%						
Net Rentability After This Date	=	3.21%						

13/05/10 12:34 ggbr4 V(0) -7700(100.00%)	26.93	-15.77	-71.53	-87.30	207733.04	207273.70	415006.73	
13/05/10 12:34 usim5 C(0) 4000(100.00%)	51.80	-15.77	-71.48	-87.25	207733.04	-207287.25	445.78	
13/05/10 16:54 ggbr4 C(3) 7700(100.00%)	26.52	-15.77	-70.44	-86.21	207719.49	-204290.21	3429.27	
13/05/10 16:54 usim5 V(3) -4000(100.00%)	51.24	-15.77	-70.70	-86.47	3429.28	204873.53	208302.80	
Current Date Raw Cash Balance	=	R\$539.94						

Current Date Withholding Income Tax Cost	=	-R\$29.83						
Current Date Net Cash Balance	=	R\$455.82						
Current Date Income Tax Cost	=	-R\$84.12						
Raw Cash After This Date	=	R\$208272.97						
Net Cash After This Date	=	R\$206867.56						
Current Date Raw Rentability Balance	=	0.26%						
Current Date Net Rentability Balance	=	0.22%						
Raw Rentability After This Date	=	4.14%						
Net Rentability After This Date	=	3.43%						

14/05/10 10:50 ggbr4 C(0) 8100(100.00%)	25.65	-15.77	-71.67	-87.44	208272.97	-207852.44	420.53	
14/05/10 10:50 usim5 V(0) -4100(100.00%)	50.39	-15.77	-71.27	-87.04	208272.97	206511.96	414784.93	
14/05/10 16:54 ggbr4 V(3) -8100(100.00%)	25.77	-15.77	-72.01	-87.78	206932.49	208649.22	415581.71	
14/05/10 16:54 usim5 C(3) 4100(100.00%)	50.20	-15.77	-70.99	-86.76	415581.71	-205906.76	209674.95	
Current Date Raw Cash Balance	=	-R\$290.73						
Current Date Withholding Income Tax Cost	=	-R\$14.02						
Current Date Net Cash Balance	=	R\$1114.68						
Current Date Income Tax Cost	=	-R\$266.38						
Raw Cash After This Date	=	R\$207982.24						
Net Cash After This Date	=	R\$207982.24						
Current Date Raw Rentability Balance	=	-0.14%						
Current Date Net Rentability Balance	=	0.54%						
Raw Rentability After This Date	=	3.99%						
Net Rentability After This Date	=	3.99%						

B Sample of “Summary Report”

This report refers to an interday forecasting to the Pair Trading USIM5 x GGBR4, provided by PLSR predictor. To avoid the generation of very large reports, the experiment presents a test period of only 10 trading days, which falls between May 3th 2010 and May 14th 2010. Its corresponding Summary Report is shown in appendix A.

Summary Report	
Predictor	= PLSR
Forecasting Scheme	= Interday
Trading Concerned	= Pairs Trading
Considered Stock(s)	= USIM5 x GGBR4
Training Period Begin Date	= 29/12/2008
Training Period End Date	= 29/04/2010
Validation Period Begin Date	= 30/04/2010
Validation Period End Date	= 30/04/2010
Test Period Begin Date	= 03/05/2010
Test Period End Date	= 14/05/2010
Number of Days	= 10
Maximum Number of Consecutive Gain Days	= 3
Maximum Number of Consecutive Loss Days	= 2
Maximum Number of Consecutive Tie Days	= 1
Number of Trades	= 36
Trading Volume	= R\$7359919.00
Number of Combined Trades	= 18
Number of Gain Combined Trades	= 9
Number of Loss Combined Trades	= 9
Number of Tie Combined Trades	= 0
Maximum Number of Consecutive Gain Combined Trades	= 2
Maximum Number of Consecutive Loss Combined Trades	= 5
Maximum Number of Consecutive Tie Combined Trades	= 0
Combined Trades Cash Balance Average	= R\$554.80
Gain Combined Trades Cash Balance Average	= R\$3616.65
Loss Combined Trades Cash Balance Average	= -R\$2507.04
Maximum Gain Combined Trades	= R\$15484.14
Maximum Loss Combined Trades	= -R\$7144.81
Number of Pairs Trading	= 9
Number of Gain Pairs Trading	= 6
Number of Loss Pairs Trading	= 3
Number of Tie Pairs Trading	= 0
Maximum Number of Consecutive Gain Pairs Trading	= 2
Maximum Number of Consecutive Loss Pairs Trading	= 2
Maximum Number of Consecutive Tie Pairs Trading	= 0
Pairs Trading Cash Balance Average	= R\$1109.60
Gain Pairs Trading Cash Balance Average	= R\$3118.75
Loss Pairs Trading Cash Balance Average	= -R\$2908.70
Maximum Gain Pairs Trading	= R\$8339.33

Maximum Loss Pairs Trading	=	-R\$4930.12	
Absolute Brokerage Tax Cost	=	-R\$567.72	
Custody Rate	=	R\$6.90	
Total Brokerage Tax Costs	=	-R\$574.62	
Trading Tax Cost	=	-R\$2097.42	
Liquidation Tax Cost	=	-R\$441.43	
Total Stock Market Tax Costs	=	-R\$2538.85	
Withholding Income Tax Cost	=	-R\$325.50	
Daytrade Income Tax Cost	=	-R\$1997.29	
Total Income Tax Costs	=	-R\$1997.29	
Total Tax Costs	=	-R\$5110.76	
Final Cash Disregarding Income Tax	=	R\$209979.53	
Raw Final Cash	=	R\$207982.24	
Net Final Cash	=	R\$207982.24	
Rentability Disregarding Income Tax	=	4.99%	
Raw Rentability	=	3.99%	
Net Rentability	=	3.99%	
Annual Rentability Disregarding Income Tax	=	233.89%	
Raw Annual Rentability	=	163.53%	
Net Annual Rentability	=	163.53%	
Maximum Drawdown	=	2.87%	

Raw Cash Balance	=	R\$2030.80	-R\$1163.88	R\$5091.96	R\$8184.49	R\$0.00	
		-R\$4930.12	-R\$2663.32	R\$1183.11	R\$539.94	-R\$283.83	
Withholding Income Tax Cost	=	-R\$20.51	-R\$31.23	-R\$59.85	-R\$154.84	R\$0.00	
		R\$0.00	R\$0.00	-R\$15.21	-R\$29.83	-R\$14.02	
Net Cash Balance	=	R\$1641.05	-R\$906.12	R\$4121.45	R\$6671.46	R\$0.00	
		-R\$3944.10	-R\$2130.66	R\$958.66	R\$455.82	R\$1121.58	
Income Tax Cost	=	-R\$389.75	R\$257.76	-R\$970.52	-R\$1513.02	R\$0.00	
		R\$986.02	R\$532.66	-R\$224.45	-R\$84.12	-R\$266.38	
Raw Cash Evolution	=	R\$202030.80	R\$200866.91	R\$205958.88	R\$214143.37	R\$214143.37	
		R\$209213.25	R\$206549.93	R\$207733.04	R\$208272.97	R\$207989.14	
Raw Rentability Balance	=	1.02%	-0.58%	2.53%	3.97%	0.00%	
		-2.30%	-1.27%	0.57%	0.26%	-0.14%	
Raw Rentability Evolution	=	1.02%	0.43%	2.98%	7.07%	7.07%	
		4.61%	3.27%	3.87%	4.14%	3.99%	
Net Cash Evolution	=	R\$201641.05	R\$200734.93	R\$204856.38	R\$211527.84	R\$211527.84	
		R\$207583.74	R\$205453.09	R\$206411.74	R\$206867.56	R\$207989.14	
Net Rentability Balance	=	0.82%	-0.45%	2.05%	3.26%	0.00%	
		-1.86%	-1.03%	0.47%	0.22%	0.54%	
Net Rentability Evolution	=	0.82%	0.37%	2.43%	5.76%	5.76%	
		3.79%	2.73%	3.21%	3.43%	3.99%	