

NOVA SCHOOL OF BUSINESS AND ECONOMICS

**FINANCIAL STATEMENT INFORMATION FOR VOLATILITY  
ESTIMATION**

# **Appendix**

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## I. List of Firms Included in Sample

Stock Exchange	Name	Sector
Austria	Andritz	Materials
Austria	CA Immobilien Anlagen	Financials
Austria	Conwert Immobilien Invest	Financials
Austria	Erste Group Bank	Financials
Austria	Flughafen Wien	Industrials
Austria	Immofinanz	Financials
Austria	Lenzing	Materials
Austria	OMV	Energy
Austria	Oesterreichische Post	Industrials
Austria	Raiffeisen Bank International	Financials
Austria	RHI	Materials
Austria	Schoeller-Bleckmann Oilfield Equipment	Energy
Austria	Telekom Austria	Telecommunication Services
Austria	UNIQA Insurance Group	Financials
Austria	Verbund	Utilities
Austria	Versicherung Gruppe	Financials
Austria	Voestalpine	Materials
Austria	Wienerberger	Materials
Austria	Zumtobel Group	Consumer Discretionary
Bulgaria	Sopharma Ad Sofia	Health Care
Bulgaria	MVision Private Equity Advisers Limited	Financials
Bulgaria	Coop Bank Ad	Financials
Bulgaria	Eurohold Bulgaria	Financials
Bulgaria	Industrial Capital Holding	Financials
Bulgaria	Industrial Holding Bulgaria	Industrials
Bulgaria	Cb First Investment Bank	Financials
Bulgaria	Monbat	Consumer Discretionary
Bulgaria	M+S Hidravlik	Consumer Discretionary
Bulgaria	Stara Planina	Industrials
Bulgaria	Holding Varna	Financials
Bulgaria	Advance Terrafund REIT	Financials
Bulgaria	Albena	Consumer Discretionary
Bulgaria	Chimimport	Financials
Czech Republic	Central European Media Enterprises	Consumer Discretionary
Czech Republic	CEZ AS	Utilities
Czech Republic	Komerčni Banka	Financials
Czech Republic	New World Resources	Materials
Czech Republic	Pegas Nonwovens	Consumer Discretionary
Czech Republic	Erste Group Bank	Financials
Czech Republic	O2 Czech Republic	Telecommunication Services
Czech Republic	Unipetrol AS	Energy
Czech Republic	Versicherung Gruppe	Financials
Estonia	Tallink Grupp AS	Industrials
Estonia	Olympic Entertainment Group AS	Consumer Discretionary
Estonia	Tallinna Vesi AS	Utilities
Estonia	Tallinna Kaubamaja AS	Consumer Staples
Estonia	Merko Ehitus AS	Industrials
Estonia	Silvano Fashion-A	Consumer Discretionary
Estonia	Harju Electrics Ltd	Industrials
Estonia	Nordecon AS	Industrials
Estonia	Baltika AS	Consumer Discretionary
Estonia	Arco Vara AS	Consumer Discretionary
Estonia	Skano Group AS	Consumer Discretionary

Stock Exchange	Name	Sector
Greece	Aegion Corporation	Industrials
Greece	Jumbo SA	Consumer Staples
Greece	Ellaktor SA	Industrials
Greece	Hellenic Petroleum SA	Energy
Greece	Eurobank Ergasias SA	Financials
Greece	Hellenic Exchanges - Athens Stock Exchange SA	Financials
Greece	Athens Water Supply & Sewage Co SA	Utilities
Greece	FF Group	Consumer Staples
Greece	GEK Terna Holding Real Estate Construction SA	Industrials
Greece	Grivalia Properties REIC AE	Financials
Greece	LAMDA Development SA	Financials
Greece	Metka SA	Information Technology
Greece	Motor Oil Hellas Corinth Refineries SA	Energy
Greece	Mytilineos Holdings SA	Industrials
Greece	Piraeus Port Authority SA	Industrials
Greece	Terna SA	Industrials
Greece	Titan Cement Co SA	Materials
Hungary	Foldhiteles Jelzálogbank Nyrt	Financials
Hungary	PannErgy Nyrt	Utilities
Hungary	Energyefficiency Plc	Energy
Hungary	Synergon Information Systems Ltd	Information Technology
Iceland	Ossur HF	Health Care
Iceland	Eimskipafelag Islands HF	Industrials
Iceland	Icelandair Group HF	Industrials
Iceland	Marel HF	Industrials
Ireland	Ryanair Holdings PLC	Industrials
Ireland	Smurfit Kappa Group PLC	Materials
Lithuania	Apranga APB	Consumer Staples
Lithuania	Agrowill Group AB	Consumer Staples
Lithuania	City Service AS	Utilities
Lithuania	Grigiskes AB	Consumer Staples
Lithuania	Gubernija AB	Consumer Staples
Lithuania	Invalda Invl AB	Financials
Lithuania	Klaipėdos Nafta AB	Energy
Lithuania	Lietuvos Juru Laivininkyste AB	Industrials
Lithuania	Linās AB	Consumer Discretionary
Lithuania	Panevezio Statybos Trestas AB	Industrials
Lithuania	Pieno Žvaigždės AB	Consumer Staples
Lithuania	Rokiškio Suris AB	Consumer Staples
Lithuania	Siaulių Bankas AB	Financials
Lithuania	TEO LT	Telecommunication Services
Lithuania	Utenos Trikotazas AB	Consumer Discretionary
Lithuania	Vilniaus Baldai AB	Consumer Discretionary
Lithuania	Vilniaus Degtinė AB	Consumer Staples
Lithuania	Vilkyskių Pieninė AB	Consumer Staples
Lithuania	Zemaitijos Pienas AB	Consumer Staples
Latvia	Latvijas Balzams AS	Consumer Staples
Latvia	Brīvais Vilnis AS	Consumer Staples
Latvia	Ditton Pievadkezu Rupnīca AS	Consumer Discretionary
Latvia	Grindeks AS	Health Care
Latvia	Grobina AS	Consumer Staples
Latvia	Latvijas Gāze AS	Utilities
Latvia	Kurzemes Atsleģa AS	Industrials
Latvia	Kurzemes CMAS AS	Consumer Staples
Latvia	Latvijas Juras Medicīnas Centrs AS	Health Care
Latvia	Daugavpils Lokomotīvu Remonta Rupnīca AS	Industrials
Latvia	Latvijas Kugniecība AS	Industrials
Latvia	Latvijas Tilti AS	Industrials

Stock Exchange	Name	Sector
Latvia	Olainfarm AS	Health Care
Latvia	Rigas Autoelektroaparatu Rupnica AS	Industrials
Latvia	Rigas Elektromasinbuves Rupnica AS	Industrials
Latvia	Rigas Juvelierizstradajumu Rupnica AS	Consumer Discretionary
Latvia	Rigas Kugu Buvetava AS	Industrials
Latvia	Vef Radiotehnika RRR AS	Information Technology
Latvia	SAF Tehnika AS	Information Technology
Latvia	Siguldas Ciltslietu Un Maksligas Apeklosanas Stacija AS	Consumer Staples
Latvia	Saldus Mezrupnieciba AS	Materials
Latvia	Tosmares Kugubuvetava AS	Industrials
Latvia	Talsu Mezrupnieciba AS	Materials
Latvia	VEF AS	Financials
Latvia	Ventspils Nafta AS	Utilities
Latvia	Valmieras Stikla Skiedra AS	Materials
Luxembourg	Arcelor Mittal	Materials
Poland	Asseco Poland SA	Information Technology
Poland	Azoty Tarnow	Materials
Poland	Bank Handlowy SA	Financials
Poland	Boryszew SA	Materials
Poland	Bank Zachodni WBK	Financials
Poland	NG2 SA	Consumer Staples
Poland	Cyfrowy Polsat SA	Consumer Discretionary
Poland	Enea SA	Utilities
Poland	Eurocash SA	Consumer Staples
Poland	ING Bank Śląski	Financials
Poland	Kernel Holding SA	Consumer Staples
Poland	KGHM Polska Miedz SA	Financials
Poland	LPP SA	Consumer Discretionary
Poland	Grupa Lotos SA	Energy
Poland	Lubelski Wegiel Bogdanka SA	Materials
Poland	mBank SA	Financials
Poland	Orange Polska SA	Telecommunication Services
Poland	Bank Pekao SA	Financials
Poland	PGE Polska Grupa Energetyczna SA	Utilities
Poland	Polskie Gornictwo Naftowe i Gazownictwo	Energy
Poland	Polski Koncern Naftowy Orlen SA	Energy
Poland	Powszechna Kasa Oszczednosci Bank Polski	Financials
Poland	Powszechny Zaklad Ubezpieczen SA	Financials
Poland	Synthos SA	Materials
Poland	Tauron Polska Energia SA	Utilities
Portugal	Altri SGPS SA	Materials
Portugal	Banco Comercial Portugues SA	Financials
Portugal	Banco BPI SA	Financials
Portugal	EDP Energias de Portugal SA	Utilities
Portugal	EDP Renovaveis SA	Utilities
Portugal	Mota-Engil SGPS SA	Industrials
Portugal	Galp Energia SGPS SA	Energy
Portugal	Impresa SGPS SA	Consumer Discretionary
Portugal	Jeronimo Martins SGPS SA	Consumer Staples
Portugal	Nos SGPS SA	Telecommunication Services
Portugal	Pharol SGPS SA	Telecommunication Services
Portugal	Portucel SA	Materials
Portugal	REN Redes Energeticas Nacionais SGPS SA	Utilities
Portugal	Semapa Sociedade de Investimento e Gestão SGPS SA	Materials
Portugal	Sonae SGPS SA	Consumer Staples
Portugal	Teixeira Duarte SA	Industrials
Slovakia	Slovnaft AS	Consumer Discretionary
Slovenia	Gorenje DD	Consumer Discretionary
Slovenia	Krka DD Novo Mesto	Health Care
Slovenia	Luka Koper DD	Industrials
Slovenia	Petrol DD Ljubljana	Energy
Slovenia	Telekom Slovenije DD	Telecommunication Services

## II. Description of Sectors and Subsectors Included in the Global Industry Classification Standard

Global Industry Classification Standard			
Sector	Subsectors		
<i>Energy</i>	Oil & Gas Producers	Oil Equipment, Services & Distribution	Alternative Energy
<i>Materials</i>	Chemicals	Basic Resources	
<i>Industrials</i>	Capital Goods	Commercial & Professional Services	Transportation & Media
<i>Consumer Discretionary</i>	Automobiles & Components	Consumer Durables & Apparel	Consumer Services
<i>Consumer Staples</i>	Food & Staples Retailing	Food, Beverage & Tobacco	Household & Personal Products
<i>Health Care</i>	Health Care Equipment & Services	Pharmaceuticals, Biotechnology & Life Sciences	
<i>Financials</i>	Banks	Diversified Financials	Insurance & Real Estate
<i>Information Technology</i>	Software & Services	Technology Hardware & Equipment	Semiconductors & Semiconductor Equipment
<i>Telecommunication Services</i>	Fixed Line Telecommunications	Mobile Telecommunications	
<i>Utilities</i>	Electricity	Gas, Water & Multiutilities	

### III. Sridharan (2015) Original Results

	I	II	III	IV	V	VI	VII	VIII
<b>V_TA</b>	-0.256*** (-10.295)							
<b>V_PEA</b>		0.231*** (-5.826)						
<b>V_SGI</b>			0.041*** (4.264)					
<b>V_σCF</b>				0.235*** (14.037)				
<b>V_Opacity</b>					0.111*** (7.124)			
<b>V_LVG</b>						0.076*** (-4.098)		
<b>V_ROA</b>							-0.155*** (-6.340)	
<b>V_BTM</b>								0.053*** (-2.892)
<b>Obs</b>	78034	78034	78034	78034	78034	78034	78034	78034
<b>Adj. R-square</b>	0.309	0.256	0.300	0.259	0.275	0.259	0.257	0.260

Regression of Log Realized Volatility on accounting-based fundamental variables – Summary of results. t-statistics in parenthesis below coefficients. \*\*\*, \*\* and \* indicate statistical significance at 1, 5 and 10 percent, respectively.

**IV. Results Obtained by Testing Hypothesis 1 but Using Two-Way Industry and Quarter Clustered Standard Errors**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>
<b>V_TA</b>	-0.153 (-0.05)							
<b>V_PEA</b>		0.031 (-0.48)						
<b>V_SGI</b>			0.014 (0.74)					
<b>V_σCF</b>				-0.037 (-1.26)				
<b>V_Opacity</b>					-0.012 (-0.44)			
<b>V_LVG</b>						0.045* (1.58)		
<b>V_ROA</b>							-0.178*** (-3.70)	
<b>V_BTM</b>								0.179*** (3.28)
<b>Obs</b>	5260	2555	3075	5076	3799	5260	5528	4604
<b>Adj. R-square</b>	0.1352	0.1213	0.2047	0.0684	0.1412	0.1197	0.1138	0.1479

Regression of Log Realized Volatility on accounting-based fundamental variables – Summary of results. t-statistics in parenthesis below coefficients. \*\*\*, \*\* and \* indicate statistical significance at 1, 5 and 10 percent, respectively.

**V. Results Obtained by Testing Hypothesis 1 but Using Two-Way Country and Quarter Clustered Standard Errors**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>
<b>V_TA</b>	-0.153 (-0.07)							
<b>V_PEA</b>		0.031 (-0.59)						
<b>V_SGI</b>			0.014 (0.68)					
<b>V_σCF</b>				-0.037 (-0.99)				
<b>V_Opacity</b>					-0.012 (-0.52)			
<b>V_LVG</b>						-0.045* (1.58)		
<b>V_ROA</b>							-0.306*** (-3.70)	
<b>V_BTM</b>								0.179*** (3.59)
<b>Obs</b>	5260	2555	3075	5076	3799	5260	5528	4604
<b>Adj. R-square</b>	0.1352	0.1213	0.2047	0.0684	0.1412	0.1197	0.1138	0.1479

Regression of Log Realized Volatility on accounting-based fundamental variables – Summary of results. t-statistics in parenthesis below coefficients. \*\*\*, \*\* and \* indicate statistical significance at 1, 5 and 10 percent, respectively.

**VI. Results Obtained by Testing Hypothesis 1 but Using Two-Way Industry and Country Clustered Standard Errors**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>VII</b>	<b>VIII</b>
<b>V_TA</b>	-0.153 (-0.08)							
<b>V_PEA</b>		0.031 (-0.47)						
<b>V_SGI</b>			0.014 (0.74)					
<b>V_σCF</b>				-0.037 (-0.94)				
<b>V_Opacity</b>					-0.011 (-0.82)			
<b>V_LVG</b>						.0455* (1.80)		
<b>V_ROA</b>							-0.178*** (-2.57)	
<b>V_BTM</b>								0.179*** (2.59)
<b>Obs</b>	5260	2555	3075	5076	3799	5260	5528	4604
<b>Adj. R-square</b>	0.1352	0.1213	0.2047	0.0684	0.1412	0.1197	0.1138	0.1479

Regression of Log Realized Volatility on accounting-based fundamental variables – Summary of results. t-statistics in parenthesis below coefficients. \*\*\*, \*\* and \* indicate statistical significance at 1, 5 and 10 percent, respectively.

**VII. Estimations of the Different Specifications for the Mean Equation (Using a Constant)**

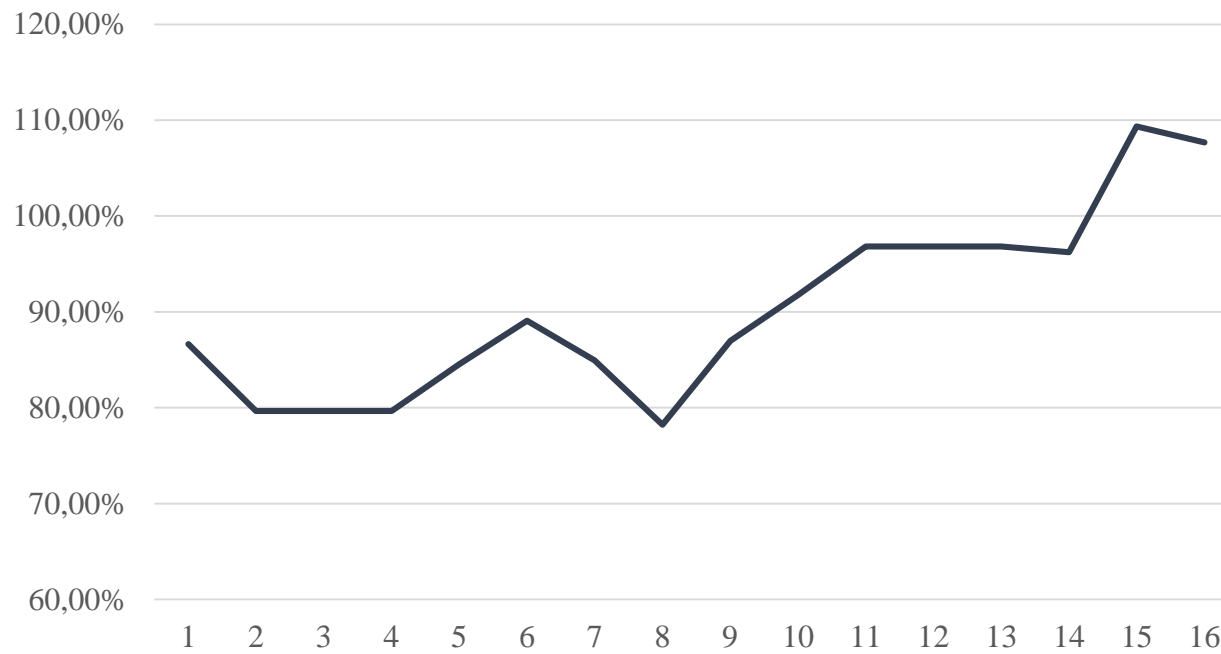
		<b>ARMA</b>								
		<b>(0,0)</b>	<b>(0,1)</b>	<b>(0,2)</b>	<b>(1,0)</b>	<b>(1,1)</b>	<b>(1,2)</b>	<b>(2,0)</b>	<b>(2,1)</b>	<b>(2,2)</b>
constant		.0257522 0.640	.0250186 0.276	.0199669 0.000	.0260448 0.522	.0204854 0.000	.0206746 0.003	.0260989 0.438	.0206621 0.002	.0623344 0.048
AR										
L1		- -	- -	- -	-.3088065 0.398	.4223644 0.190	.5023839 0.205	-.3742717 0.310	.4099069 0.262	.5073061 0.611
L2		- -	- -	- -	- -	- -	- -	-.1986109 0.412	.0409884 0.873	.8024336 0.772
MA										
L1		- -	-.5552468 0.324	-.6495559 0.003	- -	-1,0000 0.000	-1.091399 0.071	- -	-.9999999 0.000	-.4655248 0.002
L2		- -	- -	-.3504437 0.112	- -	- -	.0913987 0.880	- -	- -	.0194462 0.044
AIC		14,7127	11,7031	<b>10,8205</b>	13,69,67	11,0924	11,0475	14,4487	13,0456	14,4451
BIC		17,4473	15,8050	<b>14,0601</b>	17,7996	16,5616	16,5167	19,9178	19,8821	18,6232

**VIII. Estimations of the Different Specifications for the Mean Equation (Not Using a Constant)**

	<b>ARMA</b>								
	<b>(0,0)</b>	<b>(0,1)</b>	<b>(0,2)</b>	<b>(1,0)</b>	<b>(1,1)</b>	<b>(1,2)</b>	<b>(2,0)</b>	<b>(2,1)</b>	<b>(2,2)</b>
constant	-	-	-	-	-	-	-	-	-
AR									
L1	-	-	-	-.2988097	.3419953	.4109533	-.3569679	.3513373	.4021071
	-	-	-	0.419	0.583	0.497	0.341	0.544	0.325
L2	-	-	-	-	-	-	-.1824488	.0230332	.6354228
	-	-	-	-	-	-	0.463	0.911	0.448
MA									
L1	-	-.4670094	-.4335999	-	-1.307487	-1.343174	-	-.7794389	-.6433240
	-	0.018	0.161	-	0.020	0.073	-	0.006	0.248
L2	-	-	-.1645904	-	-	.0763604	-	-	.4013556
	-	-	0.549	-	-	0.910	-	-	0.020
AIC	-	<b>10,6941</b>	11,9650	12,1267	11,7808	13,7710	13,0777	13,7701	14,2870
BIC	-	<b>13,4287</b>	16,0669	14,8613	15,8828	19,2402	17,1796	19,2393	18,4651

## IX. Investment Strategy – Summary of Results

### Cumulative Returns



Average	<b>2,81%</b>
Stdev	<b>14,24%</b>
Skewness	<b>-0,10</b>
Kurtosis	<b>-0,08</b>
InfoSharp	<b>0,20</b>
Sharpe Ratio	<b>0,06</b>