

Subject card

Subject name and code	Modelling on Financial Market, PG_00156762						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		7.0		
Learning profile	academic		Assessment form				
Conducting unit	Department of Econometrics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Sabina Nowak				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	15.0	0.0	0.0	75
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	75		30.0		70.0	175
Subject objectives	1. Learn the fundamental properties of financial time series, including how to model and forecast them. 2. Understand the various types of factor models used to describe time series of rates of return in the capital market and gain the ability to use these models in financial analysis. 3. Comprehend the concept of an efficient market in the Fama sense and develop the ability to present logical arguments for and against capital market efficiency. 4. Learn the basic principles of financial markets within the context of their microstructure.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[liEL3_U05] The student can make a statistical description of advanced economic categories, formulate and verify simple hypotheses on their formation.	The student can perform statistical analysis on different variables describing the financial market and verify hypotheses about its informational efficiency.	[SU3] text preparation/written work [SU4] test/exam - oral or written
	[liEL3_W05] The student has advanced knowledge of the sources of socio-economic data, their databases and ways of creating them.	The student understands how to access financial market data from various sources, including databases.	[SW2] presentation/project/paper/report [SW3] text preparation/written work
	[liEL3_U07] The student can build formal models of complex economic phenomena and processes, estimate them, carry out their verification, and apply them to modelling, forecasting and optimization of the resources of low-complexity economic institutions, their structure and the course of processes in them.	The student can specify and estimate different econometric models related to the financial market, verify them, and assess their forecasting capabilities.	[SU3] text preparation/written work [SU4] test/exam - oral or written
	[liEL3_K01] The student understands the need to constantly supplement and deepen acquired knowledge; is open to new ideas and teaching methods.	The student understands the necessity of augmenting the understanding of financial market modelling and is willing to acquire modern methods on the subject.	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
	[liEL3_W01] The student has advanced knowledge of the place of social sciences in the system of sciences, their nature, methodology and connections with other sciences.	The student knows the patterns in the financial market and the models that describe them and understands how to interpret these models regarding certain relationships in economics and other social sciences.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[liEL3_W04] The student has advanced knowledge of mathematical, statistical, econometric and computer methods of obtaining, processing and analysing data depicting the functioning and development of the national economy and its elements, as well as the phenomena and processes occurring in their environment.	The student can identify various methods for modelling financial data based on their type; knows different types of econometric models related to the financial market, the methods for estimating them, the tools for verifying them, and the ways to interpret them.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report [SW3] text preparation/written work
	[liEL3_K02] The student can communicate with the public on computer science and econometrics topics in and outside the workplace, communicate his knowledge and share his skills through various media.	The student can prepare a presentation on financial market modelling and deliver it to the group in a clear and understandable manner.	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
Subject contents	1. Financial time series properties and specificity. 2. Basic concepts of financial time series. Stationarity. White noise. Correlogram. Autocorrelation function. Unit root tests. 3. Modelling of financial time series. ARMA, ARIMA, SARIMA models. 4. Forecasting stock returns based on financial time series models. Measures for assessing the quality of forecasts. 5. Estimation and verification of asset pricing models: Sharpe's model, CAPM, APT; Fama and French's multifactor asset pricing models; and the stochastic discount factor model as a generalization of factor models. 6. Efficient market hypothesis and its forms. Testing of weak efficiency: runs tests, calendar effects. Testing of semi-strong efficiency: momentum and contrarian strategies, event study analysis. Testing of strong efficiency: analysis of the investment funds' outcomes. 7. Microstructure of the financial market: definition, different forms of market organization, and their specificity. High-frequency data. Examples from world markets. 8. Intraday patterns of stock returns, bid-ask spreads and trading volumes. 9. Trade classification algorithms and the assessment of their accuracy. 10. Bid-ask spread models based on transaction indicators. Components of the bid-ask spread.		
Prerequisites and co-requisites	The student should have a basic knowledge of mathematical statistics, including formulating and testing statistical hypotheses. They should also have a basic understanding of econometrics, including standard single-equation models, multi-equation models, and basic knowledge of the capital market as it relates to investing under risk.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	two written tests	51.0%	50.0%
	final project	51.0%	50.0%

Recommended reading	Basic literature	1. Doman M., Doman R. (2009), Modelowanie zmienności i ryzyka. Metody ekonometrii finansowej. Oficyna Wolters Kluwer, Kraków. 2. Gurgul H. (2012), Analiza zdarzeń na rynkach akcji: wpływ informacji na ceny papierów wartościowych. Wolters Kluwer, Warszawa. 3. Osińska M. (2006), Ekonometria finansowa, PWE, Warszawa.
	Supplementary literature	1. Cuthbertson K., Nitzsche D. (2004), Quantitative Financial Economics. Stocks, Bonds & Foreign Exchange. 2nd ed. Wiley, Chichester. 2. Doman M. (2011), Mikrostruktura giełd papierów wartościowych, Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu, Poznań. 3. Mills T.C., Markellos R.N. (2010), The Econometric Modelling of Financial Time Series, 3rd ed. Cambridge University Press, NY (access to the electronic version of the book: UG library, eBook Collection (EBSCOhost)).
	eResources addresses	Supplementary https://search-1ebSCOhost-1com-1256wqmfq0354.hansolo.bg.ug.edu.pl/login.aspx?direct=true&db=nlebk&bquery=The+Econometric+Modelling+of+Financial+Time+Series - Mills T.C., Markellos R.N. (2010), The Econometric Modelling of Financial Time Series, 3rd ed. Cambridge University Press, NY
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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