

## Subject card

|                                             |                                                                                                                               |                                                          |                                         |                                     |                                                                                                                      |            |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Econometrics of Financial Markets I, PG_00157377                                                                              |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Field of study                              | Informatics and Econometrics                                                                                                  |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2024                                                                                                                  |                                                          | Academic year of realisation of subject |                                     | 2024/2025                                                                                                            |            |     |
| Education level                             | Master's studies                                                                                                              |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study<br>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                               | 1                                                                                                                             |                                                          | Language of instruction                 |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 2                                                                                                                             |                                                          | ECTS credits                            |                                     | 5.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                      |                                                          | Assessment form                         |                                     | exam                                                                                                                 |            |     |
| 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                                                                                                         | 15.0                                                     | 0.0                                     | 15.0                                | 0.0                                                                                                                  | 0.0        | 30  |
|                                             | 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                                                                                                         | 30                                                       |                                         | 25.0                                |                                                                                                                      | 70.0       | 125 |
| Subject objectives                          | Develop the ability to analyze and model time series of financial instrument prices and returns across different frequencies. |                                                          |                                         |                                     |                                                                                                                      |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Subject outcome                                                                                                                                                                                                                                                                                            | Method of verification                                                                                                            |
|                                 | [liEMU2_W04] The student has an in-depth knowledge of advanced mathematical, statistical, econometric and IT methods that enable the acquisition, processing and analysis of data reflecting the functioning and growth of the national economy and its components, as well as the phenomena and processes occurring in their environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The student has a deep understanding of various methods for modelling financial data based on their type. They are familiar with different types of econometric models used to describe patterns in the financial market, as well as the methods for estimating, verifying, and interpreting these models. | [SW4] test/exam - oral or written<br>[SW3] text preparation/written work<br>[SW5] implementation of a problem task                |
|                                 | [liEMU2_U05] The student is able to make a statistical description of basic and detailed economic categories at an advanced level, formulate and verify hypotheses about their formation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Students will be able to perform statistical analysis of different categories of variables describing the financial market and formulate and verify hypotheses on the behavior of prices and rates of return of various financial instruments.                                                             | [SU3] text preparation/written work<br>[SU4] test/exam - oral or written<br>[SU5] implementation of a problem task                |
|                                 | [liEMU2_W02] The student has an in-depth knowledge of economic structures and institutions, the processes taking place in them, the connections between them and their dynamics, and has an in-depth knowledge of the phenomena and processes taking place in their environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The student comprehensively understands the structures, institutions, and processes within the financial market.                                                                                                                                                                                           | [SW1] oral statement/conversation/discussion<br>[SW2] presentation/project/paper/report<br>[SW5] implementation of a problem task |
|                                 | [liEMU2_K03] The student is able to communicate freely with the public inside and outside the workplace, transfer his knowledge and share his skills through various media.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | The student can discuss topics related to financial market analysis and deliver a group presentation on this topic in an understandable and accessible manner.                                                                                                                                             | [SK1] oral statement/conversation/discussion<br>[SK2] presentation/project/paper/report                                           |
|                                 | [liEMU2_K01] The student understands the need for continuous completion and deepening of acquired knowledge. The student inspires and organizes others' learning processes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | The student understands the importance of supplementing knowledge of financial market modelling and is open to learning about modern methods of financial market analysis and sharing this knowledge with others.                                                                                          | [SK1] oral statement/conversation/discussion<br>[SK2] presentation/project/paper/report                                           |
| Subject contents                | [liEMU2_U07] The student is able to build advanced formal models of complex economic phenomena and processes, estimate them, carry out their verification and apply them to modeling, forecasting and optimization of resources of economic institutions of varying degrees of complexity, their structure and the course of processes in them.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Students can specify and estimate advanced econometric models to describe regularities occurring on the financial market, perform verification, and check their predictive properties.                                                                                                                     | [SU3] text preparation/written work<br>[SU4] test/exam - oral or written<br>[SU5] implementation of a problem task                |
|                                 | <ol style="list-style-type: none"> <li>Prices and rates of return on financial instruments and their properties. Price changes and their types, properties of logarithmic rates of return and their rescaled counterparts (stationarity, distribution, autocorrelation, volatility clustering, calendar effects). From theory to practice - empirical analyses of prices of various financial instruments and their rates of return.</li> <li>Is it possible to predict rates of return on financial instruments? The random walk hypothesis and its significance in finance. Efficient market hypothesis and its verification. From theory to practice - empirical analyses of rates of return on different types of financial instruments.</li> <li>Market efficiency. The concept of information efficiency and its types. How information efficiency relates to forecasting. Rules of trading such as moving average, channel, filter, and statistical methods. Predictability of rates of returns. From theory to practice - empirical analyses of the efficiency of trading rules for different financial instruments.</li> <li>Financial market institutions and structure. Types of markets (order-driven, quota-driven, hybrid). Structure of the market. Types of orders. Order book and its dynamics. Transaction costs. Bid-ask spread and its components (Huang-Stoll and McGroarty-Gwylim-Thomas models). From theory to practice - intraday trading patterns on the Warsaw Stock Exchange and bid-ask spread decomposition for the WIG 20 index companies.</li> </ol> |                                                                                                                                                                                                                                                                                                            |                                                                                                                                   |
|                                 | Prerequisites and co-requisites                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                            |                                                                                                                                   |
|                                 | Knowledge of elementary economics, finance, mathematics, statistics and econometrics basics. Ability to use Excel, Gretl, and EViews.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                            |                                                                                                                                   |
|                                 | Assessment methods and criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                            |                                                                                                                                   |
|                                 | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Passing threshold                                                                                                                                                                                                                                                                                          | Percentage of the final grade                                                                                                     |
| Assessment methods and criteria | written exam with open questions (tasks)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 51.0%                                                                                                                                                                                                                                                                                                      | 50.0%                                                                                                                             |
|                                 | completion of a credit work - project or presentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 51.0%                                                                                                                                                                                                                                                                                                      | 50.0%                                                                                                                             |

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| Recommended reading                                            | Basic literature         | Czekaj J. (red.) (2014), Efektywność giełdowego rynku akcji w Polsce z perspektywy dwudziestolecia, Polskie Wydawnictwo Ekonomiczne.<br>Doman M., Doman R. (2009), Modelowanie zmienności i ryzyka, Wolters Kluwer.<br>McGroarty F., Gwilym O., Thomas S. (2007), The Components of Electronic Inter-Dealer Spot FX Bid-Ask Spreads, Journal of Business Finance & Accounting, 34 (9-10), 16351650.<br>Witkowska D., Matuszewska-Janica A. , Kompa K. (2012), Wprowadzenie do ekonometrii dynamicznej i finansowej, Wydawnictwo SGGW. |
|                                                                | Supplementary literature | McGroarty F., Gwilym O., Thomas S. (2007), The Components of Electronic Inter-Dealer Spot FX Bid-Ask Spreads, Journal of Business Finance & Accounting, 34 (9-10), 16351650.                                                                                                                                                                                                                                                                                                                                                          |
|                                                                | eResources addresses     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Example issues/<br>example questions/<br>tasks being completed |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Work placement                                                 | Not applicable           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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