Module Description, available in: EN

Market Analysis and Forecasting

General Information

Number of ECTS Credits

3

Module code

TSM_MarkFor

Valid for academic year

2026-27

Last modification

2025-11-04

Coordinator of the module

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Explanations regarding the language definitions for each location:

- Instruction is given in the language specified for each location and module execution.
- Documentation is available in the language(s) listed for each location and module execution. If the documentation is in multiple languages, the percentage distributed is indicated (100% = all documentation provided).
- The examination, including both questions and answers, is provided entirely (100%) in the language(s) specified for each location and module execution. The exams are on-site.

	Lausanne			Lugano	Zurich		
Instruction					**X** E 100%		
Documentation					**X** E 100%		
Examination					**X** E 100%		

Module Category

TSM Technical scientific module

Profile Recommendations

This module is recommended for the following profiles:

	Zurich
Profile	BE

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

Good knowledge of English.
Bachelor degree in Business Administration or Engineering.

Brief course description of module objectives and content

A proper understanding of the current state and probable future development of a market is key to any successful business development. The module Market Analysis and Forecasting provides the foundations of analysis of complex socio-economic systems. It puts students in place to autonomously plan, design and execute their own qualitative and quantitative analysis. Development of well-founded forecasts and scenarios completes the understanding of customer data, markets and the socio-economic environment. Tools for the definition and the analysis of company reactions to potential future market scenarios will complete the module, allowing for transformation of market inputs into strategic choices.

Aims, content, methods

Learning objectives and competencies to be acquired

Students possess the knowledge and ability to understand and analyze markets as complex socio-economic systems. They can identify the most relevant factors determining the market behavior, to establish causal relations among these factors, and to describe techno-socio-economic systems by means of qualitative and quantitative modelling.

Students understand and apply key concepts of the theory of complex systems such as observability, controllability, time variance or invariance, randomness or determinacy of factors, linear or nonlinear, static or dynamic behavior, and they assess how these properties influence the overall system behavior.

Students apply qualitative and quantitative methods for model development and validation, including statistical analysis. Through practical examples, they learn to analyze, forecast, and control such systems. Finally, students are able to present the analytical results using different visualization techniques.

Module content with weighting of different components

The module includes the following topics:

1. Market Modelling

- Understanding the market as a complex, socio-economic system
- Outlook: system modelling in a broader context
- Understanding the role of critical success factors in the theory of complex systems
- Identification of key factors determining the dynamic, time variant and stochastic behavior of a market
- Systemic market analysis
- Experiencing complex market behavior, steering complex systems
- From qualitative to quantitative models
- Model validation
- Developing scenarios describing the market future
- Prospects and limits of modelling

2. Applications of Quantitative Methods for Market Analysis

Applications that cover topics in market analysis, for instance:

- Customer segmentation for, e.g., marketing campaign planning
- Customer feedback analysis, e.g., for service improvement planning
- Demand prediction for, e.g., electricity production planning and agricultural planning
- Credit card default prediction
- Customer life-time value consideration

Using basic quantitative methods such as:

- Data structuring, cleaning, and management
- k-Means clustering, RFM segmentation
- Decision trees
- Multiple linear- and non-linear regression, Lasso and Ridge regression
- Time series forecasting using ARIMA and LSTM models

The relevance and practical benefits of each topic will be illustrated through examples and applications. Analytical methods for problem solving will be introduced in a conceptually accessible yet methodologically rigorous manner. Particular emphasis will be placed on assessing the validity, robustness, and generalizability of analytical results, as well as on interpreting their implications for evidence-based decision making.

Teaching and learning methods

The module is taught by theory inputs, case studies and a software tool.

Literature

[1] Sterman, J. D. (2000). Business Dynamics. Systems Thinking and Modeling for a Complex World. Boston: McGraw-Hill. ISBN 978-0071241076. (Recommended.)

[2] Rob J. Hyndman, George Athanasopoulos, Forecasting: principles and practice, OTexts, 2013. The book is freely available as an online book at www.otexts.org/fpp. Alternatively, a print version is available: ISBN # 0987507109. (Required.)

Assessment

Additional performance assessment during the semester

The module does not contain an additional performance assessment during the semester

Basic principle for exams

As a rule, all standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

No electronic aids permitted

Other permissible aids

Self-written summary of 4 pages A4 for a part of the exam.

Exception: In case of an electronic Moodle exam, adjustments to the permissible aids may occur. Lecturers will announce the final permissible aids prior to the exam session.

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

No aids permitted