

Using MAKROMAT and ACTAS for Undergraduate Teaching in Economics

**Western Economic Association International
79th Annual Conference**

Session 120A

**Economic Simulations: Pedagogy and Assessment
2 July 2004, Vancouver**

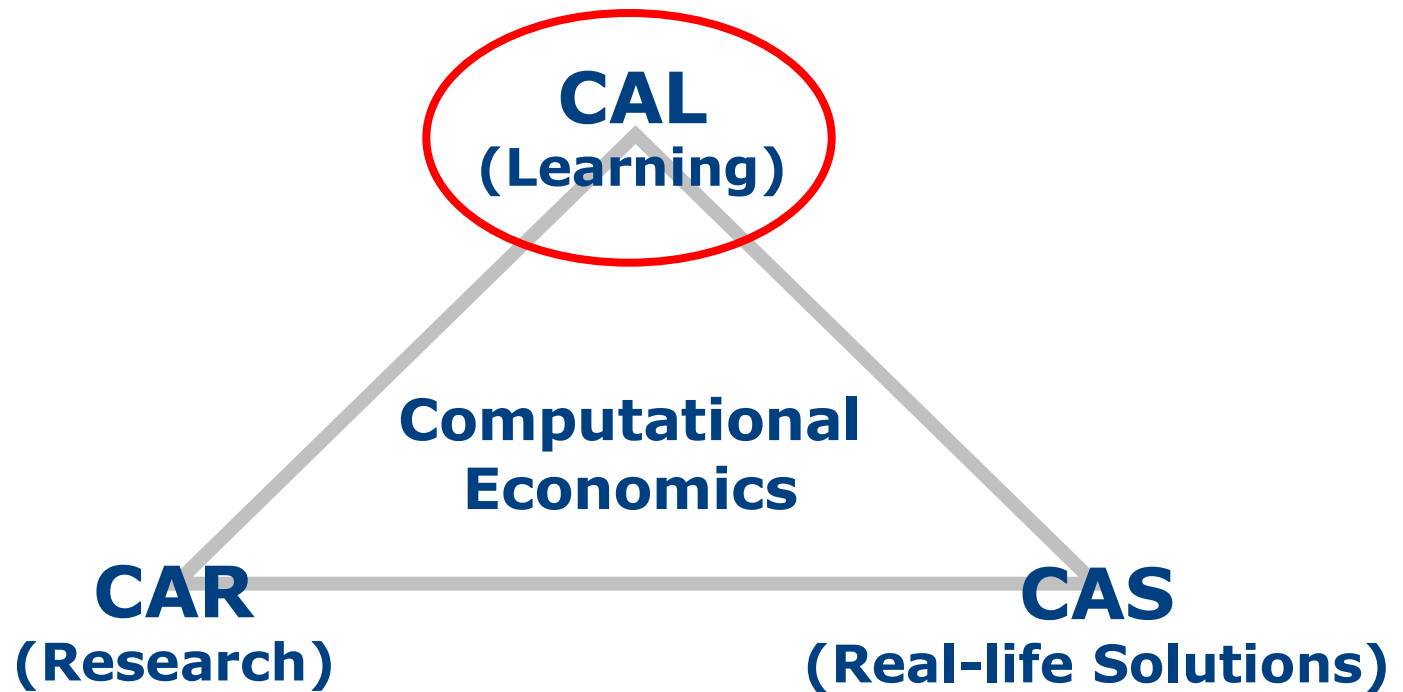
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Muenster Institute for Computational Economics
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- **Macroeconomic Simulations with MAKROMAT**
 - concept and content
 - look and feel
- **(Inter-) National Accounting with ACTAS**
 - concept and content
 - look and feel
- **Interconnection via COM-Interface**
- **Experience and Assessment**
 - University of Muenster
 - Business and Information Technology School (BiTS), Iserlohn
- **Outlook / Discussion**

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- MAKROMAT is a CAL-tool
 - supports user-driven computational experiments
 - different from training machines (CBT)
- user-friendliness
- integrated modeling framework
 - core model is expanded layer by layer
 - users makes use of more and more options of the underlying model shell
- WYGIWYK
What You Get Is What You Know

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Model Shell

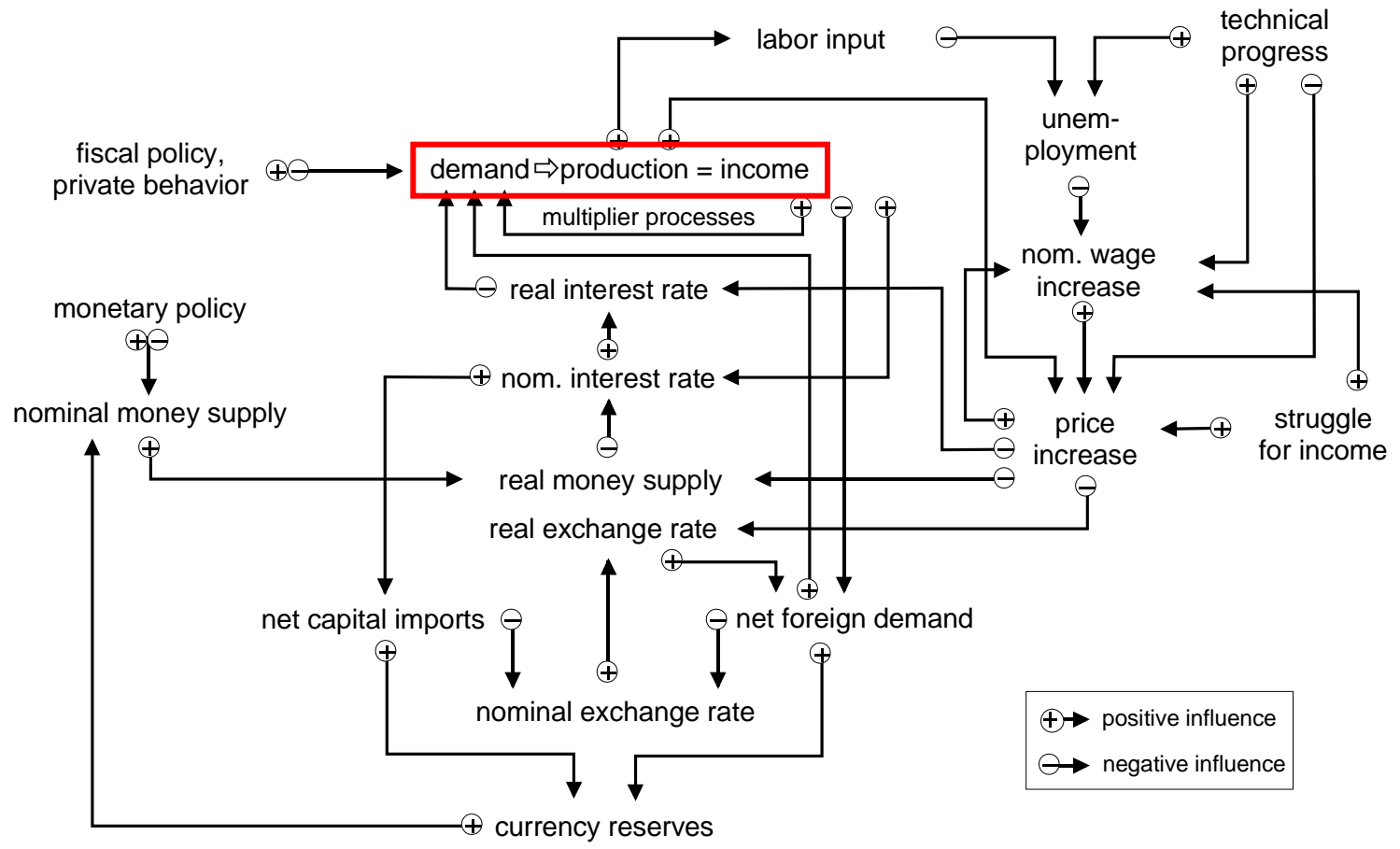
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- government intervention
- foreign trade
- inventory effects (Multiplier-Accelerator)
- financial sector / endogenous interest rate (IS-LM)
- multiple money creation process
- currency market with systems of fixed or flexible exchange rates (Mundell-Fleming)
- endogenous price level via profit maximizing firms or via mark-up pricing (AD-AS)
- labor market / endogenous wage rate
- inflation processes (DAD-DAS, Phillips-curve)

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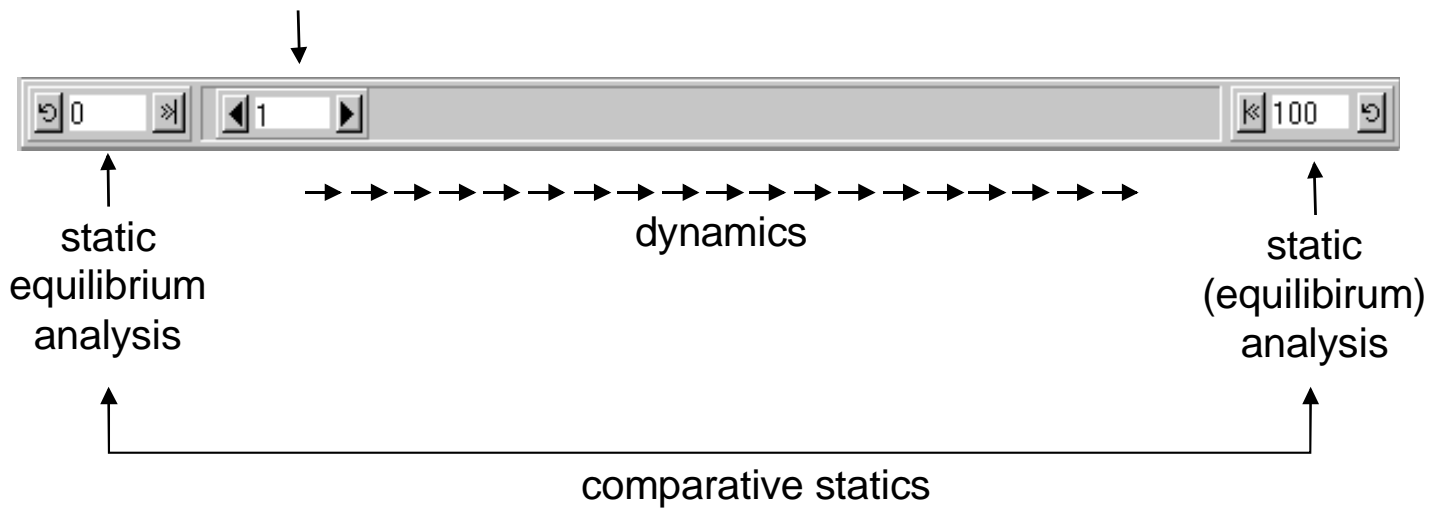
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Time Structure and Types of Analysis

- default: 100 + 1 periods
- maximum: 5000 + 1 periods

permanent or temporary disturbances
(deviation from equilibrium)



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<http://www.makromat.de>

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- backbone: real-world accounting systems
- national accounting
 - ESA 1995 (Eurostat), binding framework for all EU member countries
 - based on SNA 1993 (United Nations), therefore many compatible systems can easily adopted (like US NIPA)
- international accounting
 - BPM 5 (IMF, 1993)
- cooperation with official data sources (destatis, IMF)
- learning by using
free, structured and assisted access for beginners,
advanced students and experts

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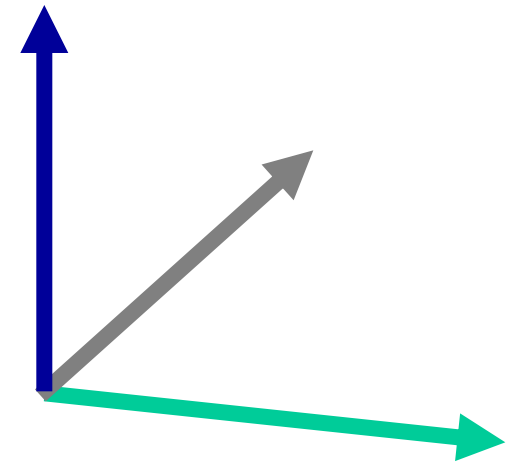
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- ESA: **20 accounts**, **37 sectors**, **80.000 transactions**
- user-tailored complexity
 - **account compression (vertical complexity)**
 - **sector consolidation (horizontal complexity)**
 - **hiding transaction details (depth complexity)**
- ACTAS keeps the system consistent and allows for free navigation and experimental accounting („do and see“)



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<http://actas.uni-muenster.de>

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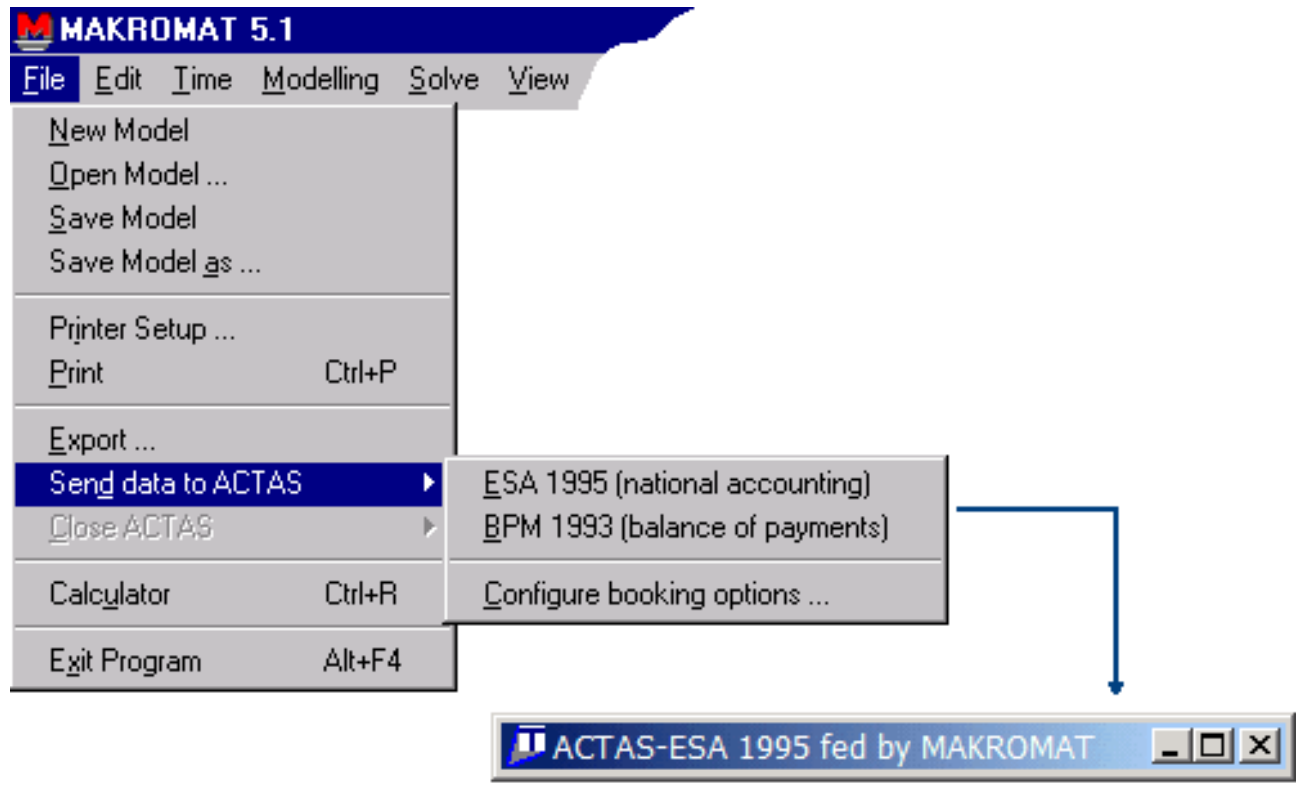
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- ACTAS ⇨ COM-Server
- MAKROMAT ⇨ COM-Client

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- **MAKROMAT**

- software backbone of macroeconomic tutorials at the University of Muenster since 1991
- 1992-1997 special courses in the faculty computer labs (funded by State Ministry of Science and Education), 300 students per year
- now integrated in standard tutorials, 800 students per year
- 1992 German-Austrian Academic Software Award

- **ACTAS**

- 1998-2000 development of ACTAS (funded by State Ministry of Science and Education)
- since 2000 regularly used in National Accounting lectures at the University of Muenster, 100 students
- 2002 European Academic Software Award finalist

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- Business and Information Technology School, Iserlohn
(private university of applied sciences)
- 4 lectures
(Winter term 2002/03 to Winter term 2003/04)
 - Introduction to Macroeconomics
 - Business Cycle and Growth Theory
 - Financial Markets
 - Globalization
- assessment by 18 students

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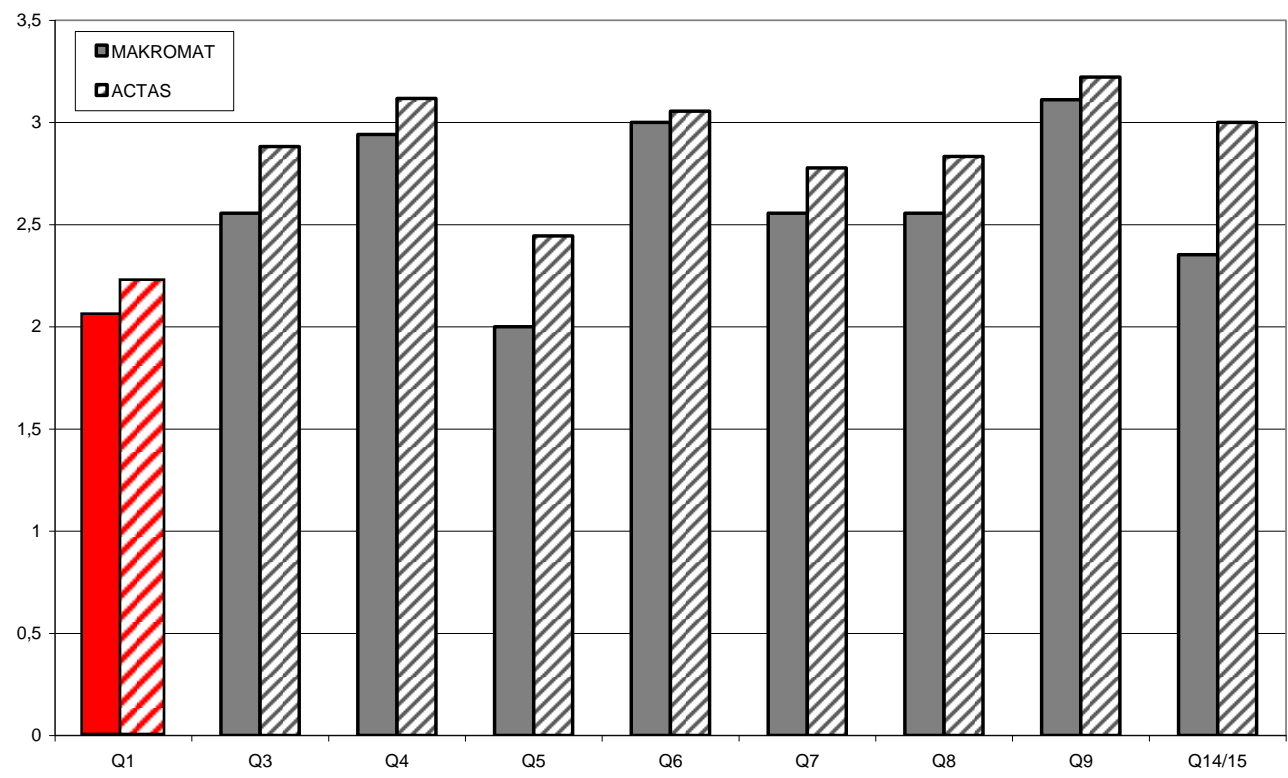
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Evaluation Results

⇒ Students clearly like the idea of having computer programs that help them cope with technical aspects of macroeconomics

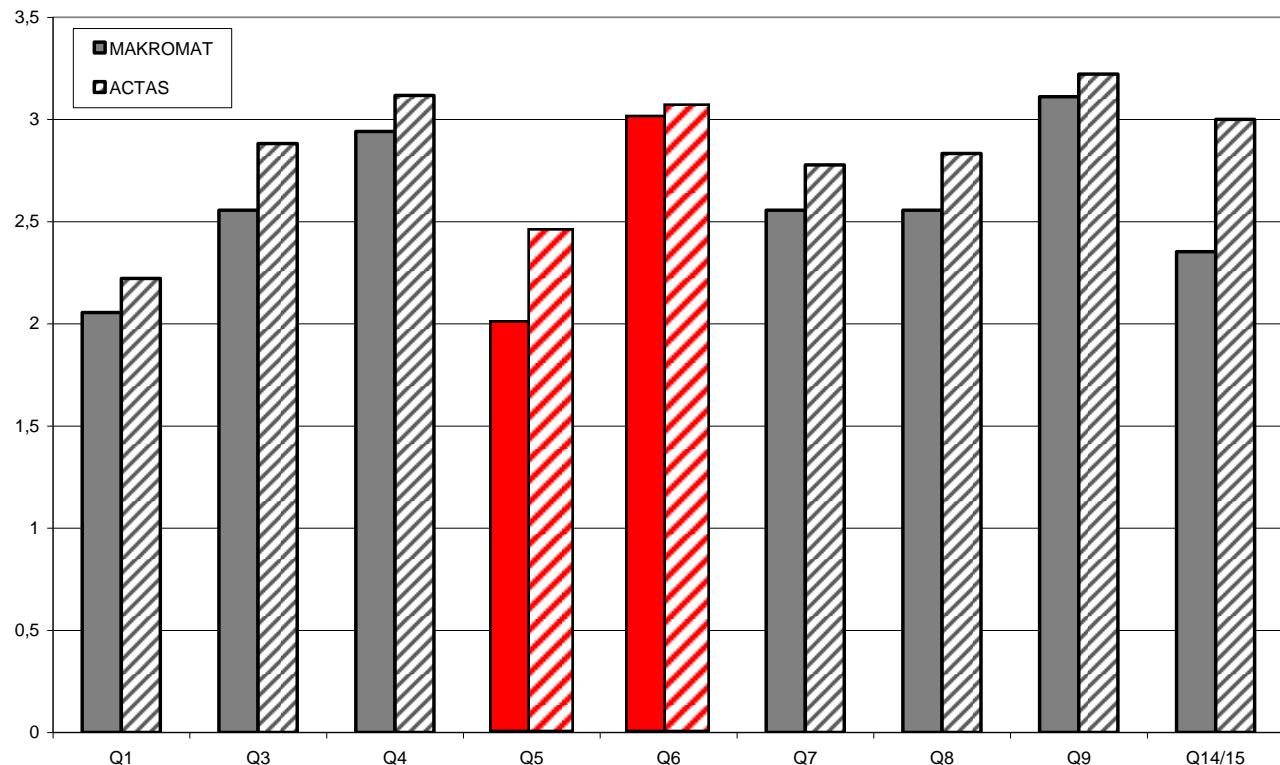
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Q1: Do you regard the use of Computer-Assisted Learning (CAL) software as useful? [very useful (1) ... not useful at all (5)]

Evaluation Results

⇒ They understand the educational strategy of MAKROMAT and ACTAS (Q5), but there is a risk that it expects too much (Q6)



Q5: How well do MAKROMAT and ACTAS reflect the toolbox approach of CAL? [very well (1) ... very badly (5)]

Q6: Did MAKROMAT and ACTAS demand more self-discipline than you could cope with? [no, never (1) ... yes, very often (5)]

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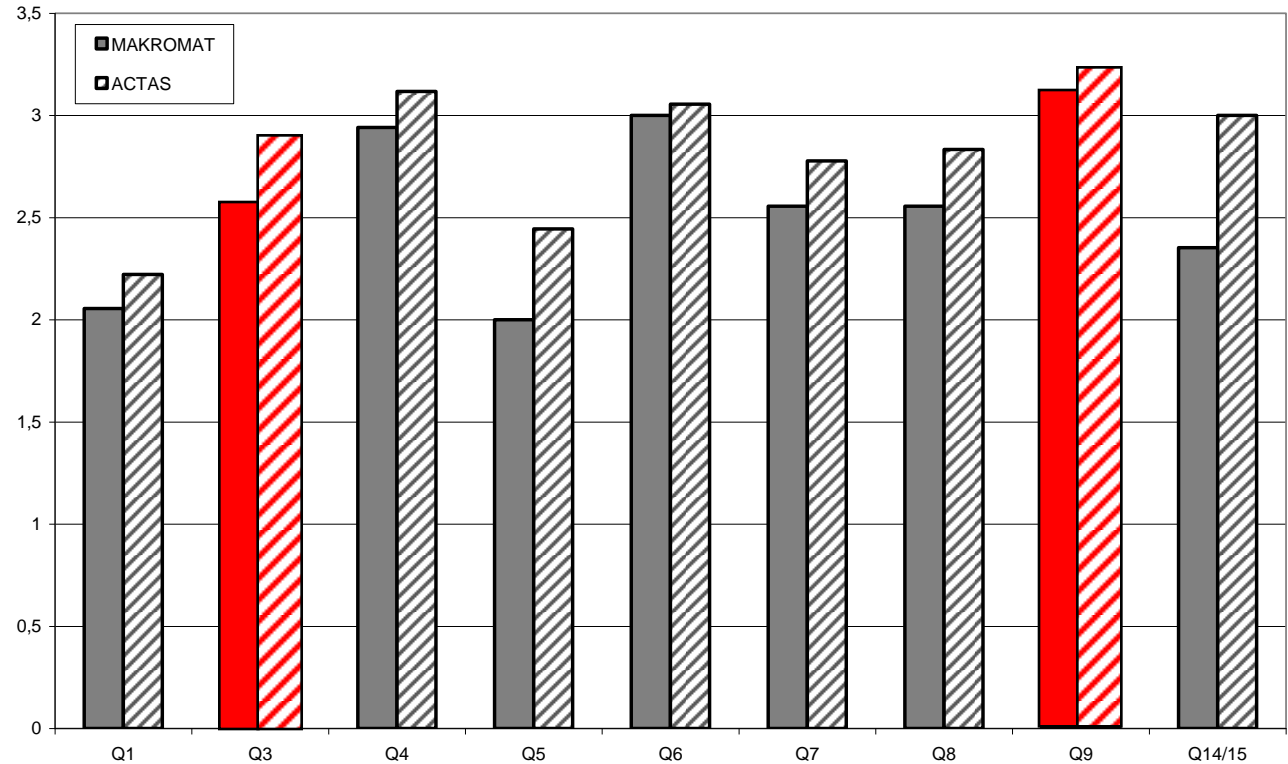
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Evaluation Results

⇒ The better the students' performance, the more useful MAKROMAT and ACTAS are for them.

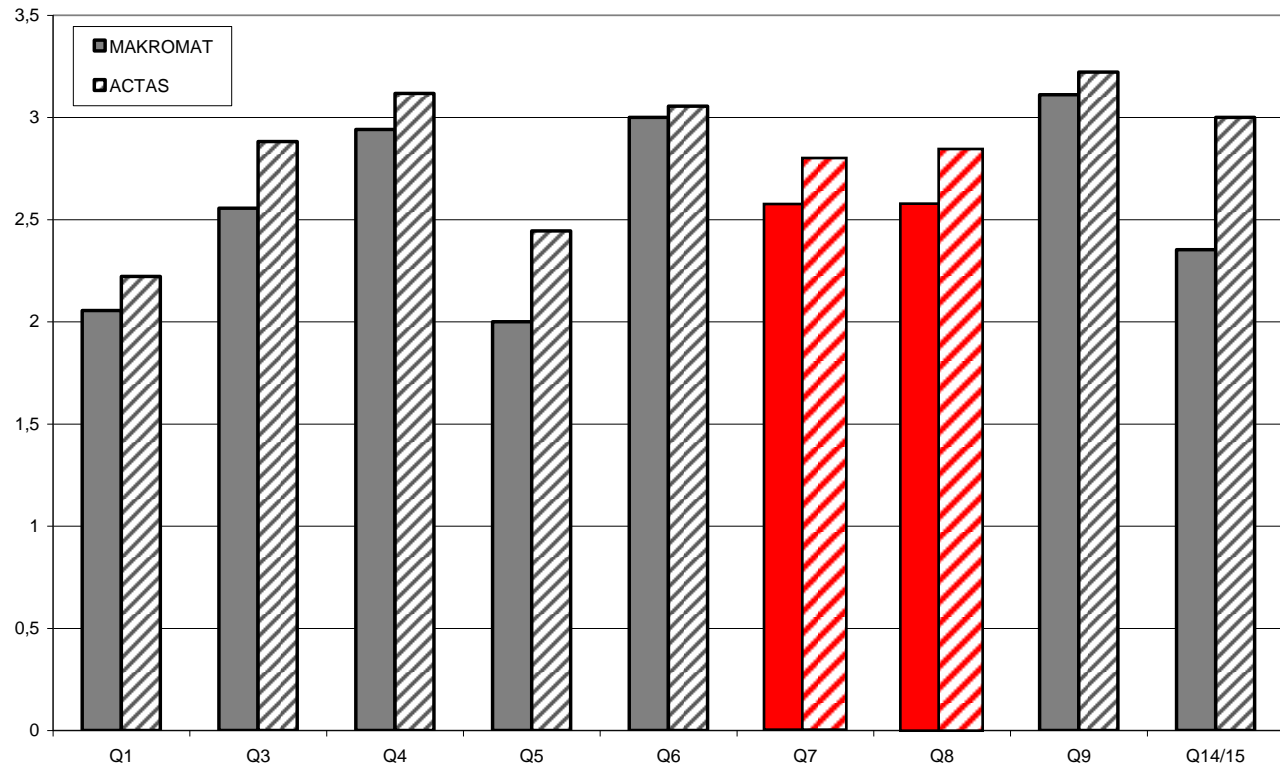
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Q3: Generally speaking, do MAKROMAT and ACTAS meet your needs? [absolutely (1) ... not at all (5)]

Q9: Do you feel that MAKROMAT and ACTAS helped you to become more familiar with macroeconomics? [absolutely (1) ... not at all (5)]

⇒ Good students are much more demanding when it comes to CAL.



Q7: How important do you regard the ability to run computational experiments with CAL software? [very important (1) ... not imp. at all (5)]

Q8: Do you agree that MAKROMAT and ACTAS help to individualize the material presented in the lectures? [absolutely (1) ... not at all (5)]

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- MAKROMAT
 - extension of the model shell (growth theory)
 - 2nd edition of the MAKROMAT text book
- ACTAS
 - further accounting systems
 - integration into text book
- CAL in general
 - linking it to the existing literature
 - more systematic assessments
(Winter term 2004: evaluation by 800 students)

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<http://mice.uni-muenster.de/presentations>

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