



# **FINANCIAL ECONOMETRICS**

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**A1-305**

# Course information (Syllabus)

## Assessment details:

Quizzes, homework, attendance:	15%
Project :	15%
Mid-term exam:	30%
Final exam:	40%

## Textbook:

**Introductory Econometrics  
for Finance, 4th edition,  
Chris Brooks, Cambridge  
University Press.**

# Project: 15%

- Team work: **analyze data using an econometric technique** using software
- Instructions:
  - Arrange a team of 2-3 students and nominate the team leader.
  - Choose a topic in Finance, specify the working data set, data source. Analyze data, using techniques and methods learned in the Econometrics course.
  - Submit a report of 4-5 pages at the end of the semester.

# Econometrics

- Econometrics: “Measurement in Economics”
- **Financial Econometrics**: application of statistical and mathematical techniques to problems in finance
- Examples:
  - Testing hypotheses concerning relationships between variables
  - Examining the effect on financial markets of changes in economic conditions
  - Forecasting future values of financial variables
- Software package: **EIEWS/STATA/R**

# Example: Hedonic House Pricing Models

- **Hedonic models** are used to value real assets, especially housing, and view the asset as representing a bundle of characteristics.
- The **rental value** per month (the dependent variable) is a function of 9 to 14 variables:

**LnAGE** - log of the apparent **age** of the property

**NBROOMS** - **number of bedrooms**

**AREABYRM** - **area** per room (in square metres)

**ELEVATOR** - a dummy variable = 1 if the building has an elevator; 0 otherwise

**BASEMENT** - a dummy variable = 1 if the unit is located in a basement; 0 otherwise

OUTPARK	- number of outdoor <b>parking spaces</b>
INDPARK	- number of indoor <b>parking spaces</b>
<b>NOLEASE</b> otherwise	- a dummy variable = 1 if the unit has no lease attached to it; 0 otherwise
LnDISTCBD	- log of the <b>distance</b> in kilometres to the central business district
SINGLPAR	- percentage of single parent families in the area where the building stands
DSHOPCNTR-	<b>distance</b> in kilometres to the nearest shopping centre
VACDIFF1	- vacancy difference between the building and the census figure

- Examine the signs and sizes of the coefficients.



# Hedonic House Price Results

## Dependent Variable: Rental Value per Month

Variable	Coefficient	<i>t</i> -ratio	<i>A priori</i> sign expected
Intercept	282.21	56.09	+
LnAGE	-53.10	-59.71	-
NBROOMS	48.47	104.81	+
AREABYRM	3.97	29.99	+
ELEVATOR	88.51	45.04	+
BASEMENT	-15.90	-11.32	-
OUTPARK	7.17	7.07	+
INDPARK	73.76	31.25	+
NOLEASE	-16.99	-7.62	-
LnDISTCBD	5.84	4.60	-
SINGLPAR	-4.27	-38.88	-
DSHOPCNTR	-10.04	-5.97	-
VACDIFF1	0.29	5.98	-

Notes: Adjusted  $R^2 = 0.651$ ; regression  $F$ -statistic = 2082.27. Source: Des Rosiers and Thériault

(1996). Reprinted with permission of the American Real Estate Society.

# Other examples

- **CAPM**
- **Credit Rating Modelling using z-score determined from financial ratios**
- **Credit Rating: Default Probability (using Logit/Probit Models)**
- **Determinants of Sovereign Ratings (using regression)**
- **Time Series Analysis (using ARIMA/ARCH/VAR...)**
- **Longterm Relationship between financial variables (using cointegration)**



Moody's		S&P		Fitch			
Long-term	Short-term	Long-term	Short-term	Long-term	Short-term		
Aaa	P-1	AAA	A-1+	AAA	F1+	Prime	
Aa1		AA+		AA+		High grade	
Aa2		AA		AA			
Aa3		AA-		AA-			
A1		A+	A-1	A+	F1	Upper medium grade	
A2		A		A			
A3	P-2	A-	A-2	A-	F2		Lower medium grade
Baa1		BBB+		BBB+			
Baa2	P-3	BBB	A-3	BBB	F3		
Baa3		BBB-		BBB-			
Ba1	Not prime	BB+	B	BB+	B	Non-investment grade speculative	
Ba2		BB		BB			
Ba3		BB-		BB-		Highly speculative	
B1		B+		B+			
B2		B		B			
B3		B-		B-			
Caa1		Not prime	CCC+	C	CCC	C	Substantial risks
Caa2			CCC				Extremely speculative
Caa3			CCC-				In default with little prospect for recovery
Ca			CC				
			C				
C		D	/	DDD	/	In default	
/				DD			
/				D			

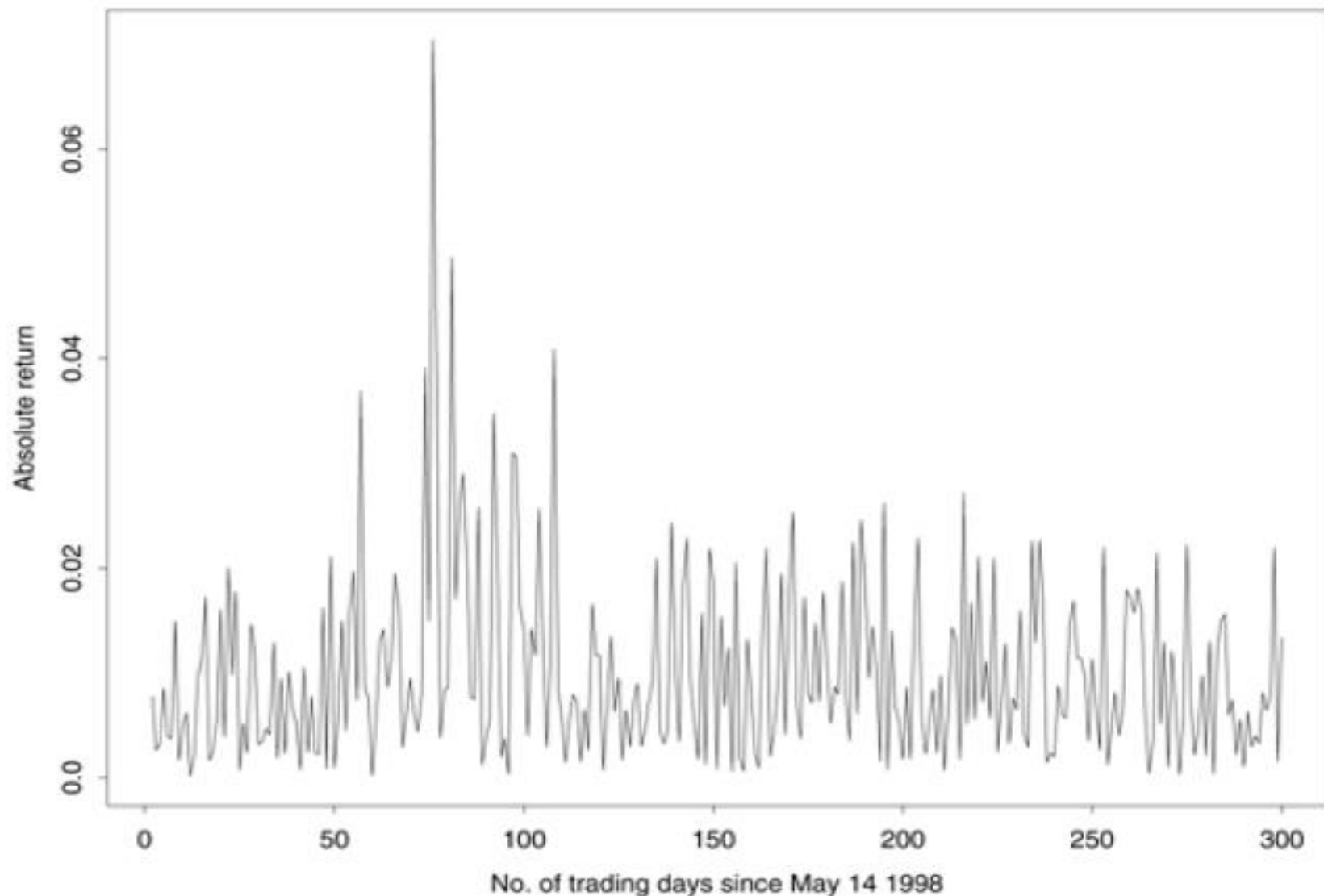


Figure 3.1. *A time plot of the absolute values of daily returns for the S&P 500 index on 300 trading days starting on May 14 1998.*

# Course Content

## Part 1: Basic Statistics

## Part 2: Linear Regression Model

## Part 3: Time Series Analysis

- Time Series Modeling and Forecasting
- Vector Auto-Regressive Model
- Modeling long-term relationship