



# VNiVERSIDAD D SALAMANCA

CAMPUS OF INTERNATIONAL EXCELLENCE

## 7<sup>th</sup> COURSE:

### Data Management and Panel Data Models

Prof. Julio Pindado and Dr. Ignacio Requejo  
Salamanca, from 8<sup>th</sup> to 12<sup>th</sup> July, 2013

**Limited Places! A Maximum of 20 Students**

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## Introduction

The aim of this course is to communicate the skills necessary to understand and assess the applications of panel data analysis reported in the Business Economics literature, and to provide skills which could be applied to analyzing a variety of research and policy problems related to Business Economics. The course is intended as an introduction to the issues and opportunities arising when a panel data structure is available. In particular, the course covers the different structures of data and the advantages and limitations of panel data. Additionally, a new approach to modern econometric analysis is provided, highlighting the role of conditional expectations. Both static and dynamic models for panel data analysis are presented, with special attention to choosing the most suitable estimator for each model. As a result, the course focuses on the decisions that the researcher should make instead of the algebraic derivation of the models. Moreover, several cases on how to derive economic models combining panel data and Stata ® are discussed. Finally, the efficient research process using panel data and Stata ® is shown by analyzing a case.

## Structure of the Course

### PART I. ECONOMETRIC MODELS FOR PANEL DATA

#### Lesson 1. Estimation Methods: Endogeneity and Instrumental Variables

- 1.1. Data Structures
- 1.2. Role of Conditional Expectations in Econometrics
- 1.3. Linear Regression Framework
- 1.4. The Endogeneity Problem: Sources and Responses
- 1.5. Instrumental Variable Estimation
- 1.6. Generalized Method of Moments

#### Lesson 2. Introduction and Linear Static Models for Panel Data

- 2.1. Characterizing Panel Data Methods
- 2.2. Advantages and Limitations of Panel Data
- 2.3. Why is the Panel Data Methodology Needed?
- 2.4. Fixed Effects Models
- 2.5. Random Effects Models
- 2.6. Fixed Effects Models versus Random Effects Models
- 2.7. Limitations of Linear Static Panel Data

#### Lesson 3. Linear Dynamic Models for Panel Data

- 3.1. Autoregressive Models
- 3.2. Models with Predetermined Variables
- 3.3. Models with Strictly Exogenous Variables
- 3.4. System GMM
  - 3.4.1 System GMM for Autoregressive Models
  - 3.4.2 System GMM for Models with Predetermined Variables
- 3.5. Specification Tests
  - 3.5.1 Testing for Residual Serial Correlation
  - 3.5.2. Testing for Overidentifying Restrictions
  - 3.5.3. Incremental Sargan Tests



#### **Lesson 4. Nonlinear Panel Data Models**

- 4.1. Introduction to Discrete Response Models
- 4.2. Fixed Effects Logit
- 4.3. Random Effects Logit
- 4.4. Censored Regression Models

#### **PART II. PANEL DATA METHODS WITH Stata ®**

#### **Lesson 5. Introduction to Data Management with Stata ®**

- 5.1. Basic Concepts
- 5.2. Format and Content of Data Files
- 5.3. Data Management
- 5.4. Stata ® Work Environment: Do Files and Output Files
- 5.5. Joining Data

#### **Lesson 6. Managing Variables for Research**

- 6.1. Types of Variables: Storage and Displaying Format
- 6.2. Management of Variables
- 6.3. Descriptive Analysis
- 6.4. Creating Variables for Research

#### **Lesson 7. Advanced Operations with Stata ®**

- 7.1. Using Matrices
- 7.2. Advanced Commands
- 7.3. Error Messages
- 7.4. Online Help

#### **Lesson 8. Model Estimation with Stata ®**

- 8.1. Introduction to Model Estimation with Stata ®
- 8.2. Estimation of Linear Static Models for Panel Data
- 8.3. Estimation of Linear Dynamic Models for Panel Data
  - 8.3.1. The Difference GMM Estimator
  - 8.3.2. The System GMM Estimator
- 8.4. Estimation of Nonlinear Panel Data Models

#### **Lesson 9. Deriving Economic Models Combining Panel Data and Stata ®: Case Analyses**

- 9.1. Improving Previous Models
- 9.2. Implementing New Research Strategies
- 9.3. Obtaining the Optimal Value of Parameters

#### **Appendix A. Panel Data and Publication**

- A.1. Explaining the Panel Data Methodology in the Paper
- A.2. How to Answer Referees' Questions on the Methodology
- A.3. Comparison between Estimators

#### **Lesson 10. Efficient Research Process by Using Panel Data and Stata ®: A Case Analysis**

- 10.1. Collecting the Data
- 10.2. Joining the Data
- 10.3. Constructing Variables
- 10.4. Constructing Variables by Using Estimation Results
- 10.5. Panel Data Structure and Variable Analysis
- 10.6. Estimation of the Model
- 10.7. Process of Incorporating New Ideas



## References

### Main References

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### Timetable

Date	Time	Lesson	Lecturer	Room
08-07-2013 Monday	16-20	Lesson 1 Lesson 2	Julio Pindado	Lecture Room
09-07-2013 Tuesday	9-13	Lesson 3 (3.1-3.4)	Julio Pindado	Lecture Room
09-07-2013 Tuesday	15-18	Lesson 5 (5.1-5.4)	Ignacio Requejo	Computer Lab.
10-07-2013 Wednesday	9-11	Lesson 3 (3.5) Lesson 4	Julio Pindado	Lecture Room



10-07-2013 Wednesday	11-13	Lesson 8 (8.1-8.2)	Julio Pindado	Computer Lab.
10-07-2013 Wednesday	15-18	Lesson 5 (5.5) Lesson 6	Ignacio Requejo	Computer Lab.
11-07-2013 Thursday	9-13	Lesson 8 (8.3-8.4)	Julio Pindado	Computer Lab.
11-07-2013 Thursday	15-18	Lesson 7	Ignacio Requejo	Computer Lab.
12-07-2013 Friday	9-11	Lesson 10 (10.1-10.3)	Ignacio Requejo	Computer Lab.
12-07-2013 Friday	11-14	Lesson 9 Appendix A Lesson 10 (10.4-10.7)	Julio Pindado	Lecture Room

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### Brief Biographies

**Julio Pindado** is Professor of Accounting and Finance at Universidad de Salamanca (Spain) and Professorial Fellow of Accounting and Finance at the Division of Accounting and Finance at Leeds University Business School, University of Leeds (UK). He has published academic peer-reviewed articles on corporate finance and governance in several top journals ranked with a high impact factor in the Journal Citation Report, such as the Strategic Management Journal, Financial Management, Journal of International Business Studies, Journal of Corporate Finance and Corporate Governance: An International Review. Prof. Pindado is Advisory Editor of Frontiers in Finance and Economics, serves as a member of the Editorial Advisory Board of Journal of Financial Regulation and Compliance and Review of Behavioral Finance. Additionally, Prof. Pindado has served as a member of the Board of Directors of the European Financial Management Association (2003-2005). He has also served as instructor at the 2004 and 2007 “Merton H. Miller” Doctoral Seminar, organized by Prof. John Doukas, managing editor of European Financial Management. Prof. Pindado has also been Visiting Fellow at the Institute of Finance and Accounting at the London Business School.

E-mail: [pindado@usal.es](mailto:pindado@usal.es) Web: <http://diarium.usal.es/pindado/>

**Ignacio Requejo** is Assistant Professor of Finance at Universidad de Salamanca (Spain). He holds a PhD degree in Business Economics with a “European Distinction” from this university. During his doctoral studies, he has stayed at Saïd Business School (University of Oxford) as a Visiting Doctoral Student and at the Centre for Corporate Governance at London Business School (University of London) as a Visiting Research Assistant. Dr. Requejo’s thesis on family firms was awarded the 2011 Best Doctoral Dissertation Award sponsored by the Family Firm Institute (FFI) and Relative Solutions. His work has been published in top finance and governance journals, including the Journal of Corporate Finance and Corporate Governance: An International Review. He has presented several papers in which the panel data methodology is used in numerous international conferences, including the Financial Management Association (FMA) International Annual Meeting, the European Financial Management Association (EFMA) Annual Conference and the Annual International Family Enterprise



Research Academy (IFERA) Conference. He has also presented his work at research seminars held at Saïd Business School, London Business School, Leeds University Business School and University of Strathclyde Business School. Dr. Requejo is Visiting Lecturer at the University of Strathclyde Business School, where he has taught at the M.Sc. Investment & Finance and M.Sc. International Banking & Finance.

E-mail: [irequejo@usal.es](mailto:irequejo@usal.es) Web: <http://www.irequejo.es/>

### Academic and Research Awards

Requejo, I.: 2011 Best Doctoral Dissertation Award sponsored by the Family Firm Institute (FFI) and Relative Solutions and awarded at the **2011 FFI Annual Conference** held in Boston (US) for the thesis entitled “Corporate Governance in Family Firms: Effects of Family Control on Firm Value and Corporate Financial Decisions”

Pindado, J., Requejo I. and de la Torre, C.: “GEEF” Best Policy-oriented Research Paper Award at the **10th Annual IFERA Conference**, which took place between the 6th and the 9th of July 2010 in Lancaster (UK), for the paper “Family control and the investment–cash flow sensitivity: Empirical evidence from the Euro zone”

Pindado, J., Requejo I. and de la Torre, C.: “University of Alberta” Best Family Business Research Paper Award at the **8th Annual IFERA Conference**, which took place between the 2nd and the 5th of July 2008 in Breukelen (The Netherlands), for the paper “Ownership concentration and firm value: Evidence from Western European family firms”

Requejo, I.: Award for the Best Paper presented at the **I International Accounting & Finance Doctoral Symposium**, which took place on the 16th and 17th of April 2008 in Prato (Italy), for the paper “The effect of family control on corporate performance”.

Pindado, J. and de la Torre, C.: Award for the Best Paper published in the **European Financial Management Journal** in 2006 for the paper “The Role of Investment, Financing and Dividend Decisions in Explaining Corporate Ownership Structure: Empirical Evidence from Spain”.

Pindado, J. and Rodrigues, L.: Award for the Best Paper published in the **Financial Markets and Portfolio Management Journal** in 2005 for the paper “Determinants of financial distress costs”.

### Publications using the Panel Data Methodology

**Pindado, J. and Requejo, I.** “Panel data: a methodology for model specification and testing”, in Finance volume of Wiley Encyclopedia of Management, (in press).

Bastos, R. and **Pindado, J.**, “Trade credit during a financial crisis: a panel data analysis”, *Journal of Business Research*, 2013, Vol. 66, pp. 614-620.

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- Pindado, J.** and de la Torre, C., “Financial Decisions as Determinants of Ownership Structure: Evidence from Spanish Family Controlled Firms”, *Managerial Finance*, 2008, Vol. 34, No. 12, pp. 868-885.
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- Pindado, J.**, Rodrigues, L. and de la Torre, C., “How does financial distress affect small firms’ financial structure?”, *Small Business Economics: An International Journal*, 2006, Vol. 26, No. 4, pp. 377-391.
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- Maestro, M. and **Pindado, J.**, “Capital structure and stock prices: Additional evidence”, *Applied Financial Economics Letters*, 2005, Vol. 1, No. 6, pp. 355-360.
- Lozano, B., Miguel, A. and **Pindado, J.**, “Dividend policy in regulated firms: An analysis from two agency problems”, *Eurasian Review of Economics and Finance*, 2005, Vol. 1, No. 1, pp. 9-22.
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### Registration

To register send an email to the Director of the course (Prof. Julio Pindado E-mail: [pindado@usal.es](mailto:pindado@usal.es)) with the following information **by April 26<sup>th</sup>**:

- Name and Surname
- Research Interests
- Country
- Brief Curriculum Vitae

To guarantee the quality of the course, only a maximum of 20 students will be accepted. The brief CV sent with your registration details will be the main acceptance criterion. **Acceptance** to the course will be communicated **by May 3<sup>rd</sup>**.

## 9

### Participation Fee

The registration fee for the **course** is **EUR 300** and includes the course materials. Apart from a binder with the contents covered in the course, a CD will be provided with the Stata files (.do, .dta and .log) that will be used during the classes. The fee also includes a welcome coffee the first day of the course and a farewell lunch that will take place on Friday, 12<sup>th</sup> July 2013 at Apartahotel Hall88:

[www.exehall88apartahotel.com/Salamanca](http://www.exehall88apartahotel.com/Salamanca)

For those accepted to the course, details on the method of payment will be provided upon notification of acceptance.

## 10

### Accommodation

Colegio Oviedo: <http://www.usal.es/webusal/node/4190>

This hall of residence is only a two minute walk from the venue.

Colegio Mayor Arzobispo Fonseca: <http://www.usal.es/webusal/node/4297>

This hall of residence is just a ten minute walk from the venue.

Apartahotel Hall88: [www.exehall88apartahotel.com/Salamanca](http://www.exehall88apartahotel.com/Salamanca)

This hotel is only a three minute walk from the venue.

Hotel Artheus Carmelitas: [www.artheushoteles.es](http://www.artheushoteles.es)

This hotel is just a fourteen minute walk from the venue.



## Course Venue

Universidad de Salamanca  
 Facultad de Economía y Empresa  
 Campus Miguel Unamuno, Edificio FES  
 37007, Salamanca (Spain)

The exact location can be found in the following internet link:

[http://www.usal.es/webusal/mapa\\_localizacion/31?mst=19](http://www.usal.es/webusal/mapa_localizacion/31?mst=19)

The Facultad de Economía y Empresa is located in the new campus of Universidad de Salamanca, just some minutes away from the bus station. The main entrance to the Course Venue is from 'Paseo de Francisco Tomás y Valiente'.



*Uni. de Salamanca – Campus Miguel Unamuno*



*Facultad de Economía y Empresa – Main Entrance*

## Brief Reference about Salamanca

Salamanca is a city in western Spain, in the region of Castilla y León. Because of its beautiful buildings and urban environment, the Old City was declared a UNESCO World Heritage Site in 1988. It is the most important University City in Spain and is known for its contributions to the teaching of the Spanish language. Salamanca attracts thousands of international students, generating a diverse multicultural environment.



*Old Facade – Universidad de Salamanca*



*View of Salamanca – Cathedral and Roman Bridge*

It is situated approximately 200 km (124 mi) west of Madrid and 80 km (50 mi) east of the Portuguese border. The University of Salamanca, which was founded in 1218, is the oldest university in Spain and the third oldest western university. With its 30,000 students, the university is, together with tourism, the economic engine of the city.



## Travelling to Salamanca

**Spanish Airports:** <http://www.aena.es>

There are some flights to Salamanca from Barcelona and Málaga. Other airports close to Salamanca are Madrid-Barajas and Valladolid-Villanubla. Madrid-Barajas is the largest Spanish airport and there are regular flights from/to most national/international destinations.

**Bus:** <http://www.venta.avanzabus.com>

There is a direct bus from Madrid airport to Salamanca. The bus stop to travel to Salamanca is located in Terminal T1 of Madrid-Barajas airport (ground floor, opposite baggage reclaim hall 2).

[http://www.aena-aeropuertos.es/csee/Satellite?Language=ES\\_ES&ca=MAD&pagename=cartografia&poi=1237555933611&ps=t&swidth=873&sheight=533](http://www.aena-aeropuertos.es/csee/Satellite?Language=ES_ES&ca=MAD&pagename=cartografia&poi=1237555933611&ps=t&swidth=873&sheight=533)

Alternatively, you can take the underground/a taxi to travel to the central bus station in Madrid (Estación de Autobuses de Madrid – Estación Sur) and take a bus from Madrid city centre to Salamanca. You can buy the bus ticket online in advance. The bus journey from Madrid to Salamanca takes approximately 2 hours and 40 minutes.

**Train:** <https://venta.renfe.com/vol/index.do>

The trains to Salamanca depart from Madrid-Chamartin train station. You can take the underground/a taxi to travel to Madrid-Chamartin train station from Madrid-Barajas airport. You can buy the train ticket online in advance. The train journey from Madrid to Salamanca takes approximately 2 hours and 40 minutes.

## Experience from Past Alumni

“The (panel data) course was divided into two closely related but distinct parts: A theoretical part that introduces the participants into advanced methods in panel data analysis, and a practical part that was an introduction of the STATA software. Both parts were extremely helpful, because the methods that were taught are the gold standard in panel data analysis. I recommend every researcher with solid knowledge about statistics and interest in learning STATA to attend this course. The organization is perfect, the atmosphere very familiar, the application process uncomplicated, and the outcome outrageous.”



**Thomas Kaspereit**  
**Universität Oldenburg (Germany)**





“It seems to me a useful course because panel data methodology is widespread in business research. Data management is another important feature of the course. Both aspects of the course have come up to my expectations. When I finished the course – especially the data management lessons with STATA – I only felt a little upset because... I realized I could have done the same work faster! So, I’m willing to apply it in my next research works.”

***Mª Pilar Velasco González***  
***University of Valladolid (Spain)***

“I found the GMM course very useful, interesting and applicable for all researchers in the areas of accounting and finance. Prof. Pindado created the right balance of theory and application such that we understood the benefits and superiority over other cross-sectional and time-series frameworks and also its limitations.

Individuals unfamiliar with Stata are not disadvantaged as Dr. Requejo and Dr. De La Torre taught the class the basics of using Stata and useful tips and tools from their experience. The program included more advanced Stata material and the best sites/forums to search for help in the future when required. Any participant of this course virtually has no impediments not to use the GMM methodology as Prof. Pindado provides the GMM Stata code, example datasets and expected results. Prof. Pindado walks you through the entire process of loading the data, applying the functions and interpretation of results.



I highly recommend this course to PhD students and early career researchers who wish to use GMM in their research as they will be able to apply the principles, tools and technology immediately upon completion of the workshop. Salamanca is a beautiful city with the 3<sup>rd</sup> oldest university in the world and an abundance of cultural and historical heritage to engage any visitor. I have to admit, one of the factors that led to my application to the workshop was the opportunity to visit Salamanca itself.”

***Kwong Yew (Rand) Low***  
***University of Queensland (Australia)***



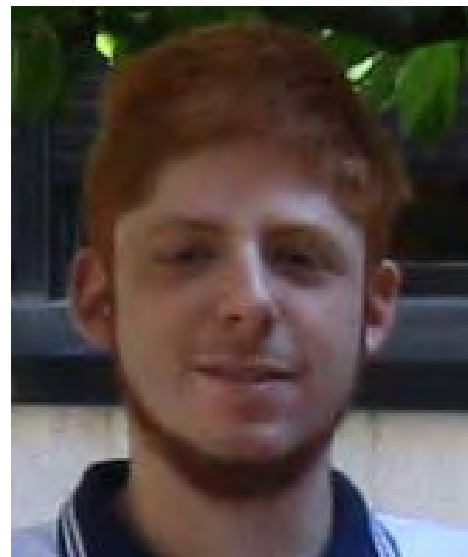


“I enjoyed the course on “Data Management and Panel Data Models” as it offered a valuable mix between the theoretical background on panel data analysis techniques with its practical application in the computer lab. Although the course was primarily focused on research in the field of finance and accounting, the instructors did a great job answering questions regarding the application of the presented methods to other / related fields. It is recommended to bring sound knowledge of statistics, but experience with STATA is not necessary as the instructors provided patiently an introduction to this software.

Overall, I have to say it was a great experience learning about panel data from two knowledgeable researchers. They presented many examples from their own research which made the learning experience even more interesting. The course was well organized, and the social events were much fun. And also the city of Salamanca was worth the trip.”

***Fabian Bernhard***  
***INSEEC – Grande École de Commerce (France)***

“The main problem in most econometric classes I attended before participating in this course was the difficulty to reconcile theory and practice. And this is precisely what the course taught by Prof. Pindado and Dr. Requejo solves. For each econometric estimation method presented, they discussed both the theoretical basis and the implementation strategy. This allows participants to better understand the reasons at the basis of each estimation procedure and the underlying assumptions and at the same time to learn how to apply and use them in their own research projects. To this main point, I would add a very interesting program, very good professors’ teaching skills and a suitable environment. I strongly advise this course!”



***Carlo Raimondo***  
***Università di Bologna (Italy)***



“The course is a real eye opener! Being developed by the high calibre academics, it is perfectly designed and extremely well taught. Starting with the intuitive explanation of fundamental principles in panel data analysis, Professor Pindado taught us when, where, and how to use the most sophisticated estimation techniques. Static, dynamic, and non-linear models were explained by using carefully selected examples from the Business Economics literature. The use of very good real-life examples always facilitates understanding, contributes to the rapid absorption of the material, and makes this course unique. The comprehensive STATA training organised by Dr. Requejo cannot be underestimated as well. It is an important part of the course - inspiring for the beginners and hugely beneficial for the experienced STATA users. Prof. Pindado and Dr. Requejo share their knowledge and expertise by demonstrating how to develop panel data models in STATA with special attention being paid to the selection of the estimator for each model, interpretation of results, and robustness tests. All participants receive excellent course material including examples of datasets and STATA codes which can be applied immediately. Upon completion of this workshop, I improved my own empirical paper significantly, as I became familiar with the principle, and had been equipped with all necessary tools. It was great to be able to learn panel data management techniques in one of the oldest Universities on the Globe in the beautiful Salamanca, with its own unique traditions, fantastic food, and difficult-to-resist shopping! I would strongly recommend this course for PhD students and early career researchers who plan to use panel data in the future.”



**Valentina Tarkovska**  
**Dublin Institute of Technology (Ireland)**

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### Additional Information

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CAMPUS OF INTERNATIONAL EXCELLENCE

Data Management and Panel Data Models  
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