Universidade de São Paulo
Faculdade de Filosofia, Letras e Ciências Humanas
Departamento de Ciência Política

FLS-6473
Métodos Quantitativos IV - Análises Temporais e Espaciais

1º semester / 2024

Class Meetings: Monday 14:00-18:00

Professor Lorena G. Barberia

This is the fourth course in a four-course sequence in the department's graduate program in political science. This course is intended to provide students with the tools necessary to conduct empirical research and to critically read the empirical research of others in the fields of political science, public policy, and social sciences employing time series and time-series cross-sectional data.

A significant share of the course is dedicated to effectively interpreting and presenting statistical results and replicating published analyses. The course assumes students have a background in algebra, statistical analysis, and econometrics. The course emphasizes innovative tools for learning quantitative methods, and most classes are taught as a flipped classroom in which labs precede lectures. Students will learn to use Stata for statistical analysis and will learn to work with observational and simulated data. Students will replicate a published study in a prominent journal for the final assignment.

Pre-requisite: Graduate students should have completed Quantitative Methods I FLS 5028 and Quantitative Methods II FLS 6183 or the equivalent.

Textbooks

Levendis, John D. 2018. *Time Series Econometrics: Learning Through Replication*. Springer Texts in Business and Economics. Cham: Springer.

Söderbom, M., Teal, F., Eberhardt, M., Quinn, S., Zeitlin, A. 2015. *Empirical Development Economics*. London: Routledge.

Advance Textbooks

Enders, Walter. 2015. *Applied Econometric Time Series*, 4th edition. New Jersey: Wiley.

Greene, William H. 2017. *Econometric Analysis*, 8th edition. New York: Pearson.

Additional Readings

Barberia, Lorena G. 2019. *Desenho de Pesquisa em Política Comparada*. Brasília: Coleção Metodologias de Pesquisa for Escola Nacional de Administração Pública (ENAP).

De Boef, Suzanna, and Luke Keele. 2008. "Taking Time Seriously." *American Journal of Political Science* 52.1: 184-200.

Ditzen, Jan. 2018. "Estimating Dynamic Common Correlated Effects in Stata." *The Stata Journal*, 18:3: 585-617.

Ditzen, J., Karavias, Y. & Westerlund, J. 2021. "Testing and Estimating Structural Breaks in Time Series and Panel Data in Stata." arXiv:2110.14550 [econ.EM].

Ditzen, Jan, A. Ahrens, C. Aitken, E. Ersoy, D. Kohns and M. Schaffer. 2021. "A Theory-based Lasso for Time-Series Data." *Studies in Computational Intelligence 898: Data Science for Financial Econometrics.*

Kellstedt, Paul M., and Guy D. Whitten. 2013. *The Fundamentals of Political Science Research*. 2nd ed. Cambridge; New York: Cambridge University Press. (Também disponível em português: Kellstedt, Paul M., and Guy D. Whitten. 2015. *Fundamentos da Pesquisa em Ciência Política* (Lorena Barberia, Gilmar Masiero and Patrick Cunha Silva, Translators). São Paulo, Brazil: Editora Blucher.

Kripfganz, S. 2016. "xtdpdqml: Quasi-maximum likelihood estimation of linear dynamic short-T panel data models." *The Stata Journal* 16.4, 1013-1038.

Kripfganz, S., and C. Schwarz. 2019. "Estimation of linear dynamic panel data models with time-invariant regressors." *Journal of Applied Econometrics* 34 (4), 526-546.

Kripfganz, S., and D. C. Schneider 2023. "ardl: Estimating autoregressive distributed lag and equilibrium correction models." *Stata Journal* 23 (4), forthcoming.

Kripfganz, S., and V. Sarafidis. 2023. "Estimating spatial dynamic panel data models with unobserved common factors in Stata." Working Paper.

Pickup, Mark. 2014. *Introduction to Time Series Analysis*. Vol. 174. Sage Publications.

Stimson James A. 1985. "Regression in Space and Time: A Statistical Essay." *American Journal of Political Science* 29:91

STATA Tutorials

Baum, Christopher F. 2006. *An Introduction to Modern Econometrics Using Stata*. Stata Press.

Cameron, Colin and Pravin Trivedi. 2010. *Microeconometrics Using Stata*. 2nd ed. Stata Press.

Rodríguez, Germán. 2011. Stata Tutorial. See: http://data.princeton.edu/stata/.
UCLA Academic Technology Services. Resources to help you learn and use Stata. See: http://www.ats.ucla.edu/stat/stata/default.htm.

Grades

1. Labs: 50%

2. Final Time-Series Project: 25%
3. Final Time-Series Cross-Section Project: 25%

Time-Series Project and Time-Series Cross-Section Project
Students will submit a 10-page paper on a single-unit time series analysis and the data and do files to replicate the reported findings. The data must be either yearly, quarterly, monthly or weekly time series. Students should work with data with a minimum of 40-time observations.

Students will also submit a 10-page paper on a cross-sectional time series analysis with at least three spatial units, and 40-time observations for each of these units.

Topics and Course Dates

1. Introduction to Time Series and Time Series Cross-Sectional Analysis (March 18, 2024)

Levendis, Chapter 1

Additional Reading:

Barberia, Lorena G. 2019. *Desenho de Pesquisa em Política Comparada*. Brasília: Coleção Metodologias de Pesquisa for Escola Nacional de Administração Pública (ENAP).

2. Review of Multiple Regression and Autocorrelated Disturbances and Introduction to Stata (March 25, 2024)

Kellstedt and Whitten Chapters 9 and 10

Lab 1: Review of Multiple Regression, Simulations and Introduction to Stata

3. Estimation of Time Series Processes (April 1, 2024)

Levendis, Chapters 2 and 3

Lab 2: Time Series, Introduction to TS Processes (DGPs, Autocorrelation, ARMAs and IRFs)

4. Estimation of Stationary and Non-stationary Time Series Processes (April 8 and 15, 2024)

Levendis, Chapters 4 and 5

Additional Reading:

Ditzen, J., Karavias, Y. & Westerlund, J. 2021. "Testing and Estimating Structural Breaks in Time Series and Panel Data in Stata." arXiv:2110.14550 [econ.EM].

Lab 3: Stationary and Non-stationary processes

5. Unit Root and Autocorrelation Tests (April 22, 2024)

Levendis, Chapter 7 and 8

Lab 4: Unit Root Tests

6. Vector-Autoregressive Models (April 29, 2024)

Levendis, Chapters 10 and 11

Additional Readings:
Jaeger, David A., and M. Daniele Paserman. 2008. "The cycle of violence? An empirical analysis of fatalities in the Palestinian-Israeli conflict." *American Economic Review* 98, no. 4: 1591-1604.

Asali, Muhammad, Aamer S. Abu-Qarn, and Michael Beenstock. 2017. "The cycle of violence in the Second Intifada: Causality in nonlinear vector autoregressive models." *Journal of Applied Econometrics* 32, no. 6: 1197-1205.

Lab 5: VARs

Lab 6: Palestinian and Israeli Fatalities

7. Cointegration Analysis (May 6, 2024)

Levendis, Chapter 12

Lab 7: Cointegration

8. Introduction to TSCS Data and Panel Unit Root Tests (May 13, 2024)

Söderbom et al., Chapter 9 and 10

Stimson James A. 1985. "Regression in Space and Time: A Statistical Essay." *American Journal of Political Science* 29:91

Lab 8: Stimson Simulation Part 1

9. Short T Dynamic Panel Data Models (May 20, 2024)

Söderbom et al., Chapter 24.

Additional Reading:

Kripfganz, S. 2016. "xtdpdqml: Quasi-maximum likelihood estimation of linear dynamic short-T panel data models." *The Stata Journal* 16.4, 1013-1038.

Lab 9: Stimson Simulation Part 2

10. Large Heterogeneous Panel Data Models (May 27, 2024)

Söderbom et al., Chapter 26 & 27.

Additional Readings:

Kripfganz, S., and C. Schwarz. 2019. "Estimation of linear dynamic panel data models with time-invariant regressors." *Journal of Applied Econometrics* 34 (4), 526-546.

Ditzen, Jan. 2018. "Estimating Dynamic Common Correlated Effects in Stata." *The Stata Journal*, 18:3: 585-617.

Kripfganz, S., and V. Sarafidis. 2023. "Estimating spatial dynamic panel data models with unobserved common factors in Stata." Working Paper.

Lab 10: Common Correlated Effect Models

11. Lasso and Time Series Analysis (June 2, 2023)

Ditzen, Jan, A. Ahrens, C. Aitken, E. Ersoy, D. Kohns and M. Schaffer. 2021. "A Theory-based Lasso for Time-Series Data." *Studies in Computational Intelligence 898: Data Science for Financial Econometrics.*