

# Federico Belotti

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## Positions

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Associate Professor of Econometrics - Department of Economics and Finance, University of Rome Tor Vergata (Nov 2019 - present);

Assistant Professor of Econometrics - Department of Economics and Finance, University of Rome Tor Vergata (Nov 2016 - Oct 2019);

Post-doctoral Researcher, CEIS - University of Rome Tor Vergata (Nov 2011 - Oct 2016);

Research assistant, CEIS - University of Rome Tor Vergata (2009-2011);

Visiting scholar at Hunter College CUNY (NY), Faculty of Economics (September 2010-April 2011);

Researcher, Italian National Institute of Statistics (ISTAT, 2005-2008).

## Fields of Research Interest

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Microeconometrics methods, Spatial and networks econometrics, Health economics.

## Education

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B.A. Economics, University of Rome Tor Vergata, 2004.

M.Sc. Economics, University of Rome Tor Vergata, 2005.

Ph.D. Econometrics and Empirical Economics, University of Rome Tor Vergata, 2011.

*Dissertation:* "Three Essays on Applied Econometrics".

*Committee:* Vincenzo Atella, Partha Deb, William H. Greene.

## Awards

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[The Stata Journal Editors' Prize](#), 2018.

Best Italian Ph.D. thesis in Applied Statistics and Demography discussed in 2011. 46<sup>th</sup> Italian Statistical Society Scientific Meeting, Rome, IT.

Best "Young Researcher" Paper. "Consistent Estimation of the True Fixed-effects Stochastic Frontier Model". European Workshop on Efficiency and Productivity Analysis, 2011, Verona, IT.

## Research

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### Publications

- 2021 Atella, V., Belotti, F., Kim, D., Goldman, D., Gracner, T., Piano Mortari, A., Tysinger, B. “The future of the elderly population health status: filling a knowledge gap”, *Health Economics*, (forthcoming).
- Belotti, F., Borin, A., Mancini, M. “Economic analysis with Inter-Country Input-Output tables using Stata”. *Stata Journal*, (forthcoming).
- 2020 Belotti, F., Di Porto, E., Santoni, G. “The Effect of Local Taxes on Firm Performance: Evidence from Geo-referenced Data”. *Journal of Regional Science*, 61(2), 492-510.
- Belotti, F., Peracchi, F. “Fast leave-one-out methods for inference, model selection, and diagnostic checking”. *Stata Journal*, 20(4), 785-804.
- 2019 Atella V., Belotti, F., Bojke, C., Castelli, A., Grasic, K., Kopinska, J., Piano Mortari, A. and Street, A. How Health Policy Shapes Healthcare Sector Productivity? Evidence from Italy and UK. *Health Policy*, 123(1), 27-36.
- Atella, V., Belotti, F., Cricelli, C., Fontana, L., Kopinska, J., Lapi, F. and Piano Mortari, A. Trends in Age-Related Disease Burden and Health Care Utilization. *Aging Cell*, 18(1), 1-8.
- 2018 Belotti, F., Di Porto, E., Santoni, G. “Spatial Differencing: Estimation and Inference”. *CEifo Economic Studies*, 64(2), 241-254.
- Belotti, F., Ilardi, G. “Consistent Inference in Fixed-effects Stochastic Frontier Models”. *Journal of Econometrics*, 202, 161-177.
- 2017 Atella, V., Belotti, F., Depalo, D. “Drug Therapy Adherence and Health Outcomes in Presence of Physician and Patient Unobserved Heterogeneity”. *Health Economics*, 26, 106-126.
- Belotti, F., Hughes, G., Piano Mortari, A. “Spatial Panel Data Models using Stata”. *Stata Journal*, 17(1), 139-180.
- Arslan, A., Belotti, F., Lipper, L. “Smallholder productivity and weather shocks: Adoption and impact of widely promoted agricultural practices in Tanzania”. *Food Policy*, 69, 68-81.
- 2015 Belotti, F., Deb, P., Norton, E.C., Manning, W.G. “Estimating Two-part Models”. *Stata Journal*, 15(1), 3-20.
- Atella, V., Kopinska, J., Medea, G., Belotti, F., Tosti, V., Piano Mortari, A., Cricelli, C., Fontana, L. “Excess Body Weight Increases the Burden of Age-Associated Chronic Diseases and their Associated Health Care Expenditures”. *Aging*, 7(10), 882-892.
- Bartolucci, F., Belotti, F., Peracchi, F. “Testing for Time-invariant Unobserved Heterogeneity in Generalized Linear Panel Data Models”. *Journal of Econometrics*, 184(1), 111-123.

- 2014 Atella, V., Belotti, F., Depalo, D., Piano Mortari, A. “Measuring Spatial Effects in Presence of Institutional Constraints: The Case of Italian Local Health Authority Expenditure”. *Regional Science and Urban Economics*, 49, 232-241.
- 2013 Belotti, F., Daidone, S., Ilardi, G., Atella, V. “Stochastic Frontier Analysis using Stata”. *Stata Journal*, 10(3), 458-481.
- 2010 Belotti, F., Depalo, D. “Translation from Narrative Text to Standard Codes Variables with Stata”. *Stata Journal*, 13(4), 719-758.
- Arduini, D., Belotti, F., Denni, M., Giungato, G., Zanfei, A. “Technology Adoption and Innovation in Public Services. The Case of E-Government in Italy”. *Information Economics and Policy*, 22(3), 257-275.

### Chapters

1. Atella, V., Belotti, F., Blaylock, B., Goldman, D., Piano Mortari, A., Tysinger, B. (2017) “Life course inequality across generations”. In: Preventing Ageing Unequally. 135-176, OECD publishing, Paris, ISBN: 9789264279070.

### Manuscripts Under Review

1. Belotti, F., Kopinska, J., Palma, A., and Piano Mortari, A. “Health Status and the Great Recession. Evidence from Electronic Health Records”. *R&R Health Economics*
2. Belotti, F., Ferrara, G. “Imposing monotonicity in stochastic frontier models: an iterative nonlinear least squares procedure”. *R&R Statistical Methods and Applications*
3. Yu, J., Tysinger, B., Piano Mortari, A., Belotti, F., Atella, V., Goldman, D. “The return to preventing chronic disease in Europe and United States”. *R&R The Journal of Human Capital*
4. Belotti, F., Casini, A., Perron, P., Grassi, S., Catania, L. “Simultaneous bandwidths determination for DK-HAC estimators and long-run variance estimation in nonparametric settings”.

### Work in Progress

1. Atella, V., Belotti, F., Bhattacharya, J., Depalo, D., “When Technological Advance Meets Physician Learning in Drug Prescribing”.
2. Aquaro, M., Belotti, F., Johnsson, I. “Estimation and Inference for Spatial Models with Heterogeneous Coefficients in MATLAB, Python, R, and Stata”.
3. Belotti, F., Ilardi G., Piano Mortari, A. “Estimation of Stochastic Frontier Models with Spatial Inefficiency”.
4. Belotti, F., Di Porto, E., Arduini, T., “Estimation in presence of (Unobserved) Spatial Heterogeneity”.
5. Belotti, F., Campioni, E., Larocca, V., Marazzi, F., Panaccione, L., Piano Mortari, A. “Born to run: coordination failure and the role of expectations in experimental withdrawal games”.

*Working Papers*

1. Belotti, F., Casini, A., Catania, L., Grassi, S., and Perron, P. (2021). Simultaneous Bandwidths Determination for DK-HAC Estimators and Long-Run Variance Estimation in Nonparametric Settings. Papers 2103.00060, arXiv.org
2. Atella, V., Belotti, F., Daejung, K., Goldman, D., Gracner, T., Mortari, A. P., and Tysinger, B. (2020). The Future of the Elderly Population Health Status: Filling a Knowledge Gap. CEIS Research Paper 504, Tor Vergata University, CEIS
3. Belotti, F., Borin, A., and Mancini, M. (2020). *icio* : Economic Analysis with Inter-Country Input-Output Tables in Stata. Policy Research Working Paper Series 9156, The World Bank
4. Depalo, D., Bhattacharya, J., Atella, V., and Belotti, F. (2019). When Technological Advance Meets Physician Learning in Drug Prescribing. NBER Working Papers 26202, National Bureau of Economic Research, Inc.
5. Belotti, F. and Ferrara, G. (2019). Imposing monotonicity in stochastic frontier models: an iterative nonlinear least squares procedure. CEIS Research Paper 462, Tor Vergata University, CEIS.
6. Belotti, F., Ilardi, G., and Mortari, A. P. (2019). Estimation of Stochastic Frontier Panel Data Models with Spatial Inefficiency. CEIS Research Paper 459, Tor Vergata University, CEIS.
7. Atella, V., Belotti, F., Kopinska, J., Palma, A., and Mortari, A. P. (2018). Economic Crisis, Mortality and Health Status. A New Perspective. CEIS Research Paper 425, Tor Vergata University, CEIS.
8. Belotti, F., Porto, E. D., and Santoni, G. (2017a). Spatial Differencing: Estimation and Inference. CSEF Working Papers 474, Centre for Studies in Economics and Finance (CSEF), University of Naples, Italy.
9. Belotti, F. and Ilardi, G. (2017). Consistent inference in fixed-effects stochastic frontier models. Temi di discussione (Economic working papers) 1147, Bank of Italy, Economic Research and International Relations Area.
10. Belotti, F., Porto, E. D., and Santoni, G. (2017b). Spatial Differencing: Estimation and Inference. Working Papers 2017-10, CEPPII research center.
11. Atella, V., Belotti, F., Kopinska, J., Palma, A., and Mortari, A. P. (2018). Economic Crisis, Mortality and Health Status. A New Perspective. CEIS Research Paper 425, Tor Vergata University, CEIS.
12. Atella, V., Belotti, F., Bojke, C., Castelli, A., Grašić, K., Kopinska, J., Mortari, A. P., and Street, A. (2017a). Against All Odds: The Contribution of the Healthcare Sector to Productivity. Evidence from Italy and UK from 2004 to 2011. CEIS Research Paper 418, Tor Vergata University, CEIS.
13. Atella, V., Belotti, F., Carrino, L., and Mortari, A. P. (2017b). The future of Long Term Care in Europe. An investigation using a dynamic microsimulation model. CEIS Research Paper 405, Tor Vergata University, CEIS.
14. Atella, V., Belotti, F., Cricelli, C., Dankova, D., Kopinska, J., Palma, A., and Mortari, A. P. (2017c). The “Double Expansion of Morbidity” Hypothesis: Evidence from Italy. CEIS Research Paper 396, Tor Vergata University, CEIS.

15. Arslan, A., Belotti, F., and Lipper, L. (2016b). Smallholder productivity and weather shocks: Adoption and impact of widely promoted agricultural practices in Tanzania. CEIS Research Paper 388, Tor Vergata University, CEIS.
16. Belotti, F., Hughes, G., and Mortari, A. P. (2016c). Spatial panel data models using Stata. CEIS Research Paper 373, Tor Vergata University, CEIS.
17. Arslan, A., Belotti, F., Asfaw, S., Karfakis, P., and Lipper, L. (2016a). Welfare impacts of climate shocks: evidence from Tanzania. ESA Working Papers 288968, Food and Agriculture Organization of the United Nations, Agricultural Development Economics Division (ESA).
18. Belotti, F., di Porto, E., and Santoni, G. (2016a). The effect of local taxes on firm performance: evidence from geo referenced data. Working Papers 2016-03, CEPII research center.
19. Belotti, F., Di Porto, E., and Santoni, G. (2016b). The effect of local taxes on firm performance: evidence from geo-referenced data. Working Paper Series 2016:3, Uppsala University, Department of Economics.
20. Belotti, F., Porto, E. D., and Santoni, G. (2016d). The Effect of Local Taxes on Firm Performance: Evidence from Geo-referenced Data. CSEF Working Papers 430, Centre for Studies in Economics and Finance (CSEF), University of Naples, Italy.
21. Atella, V., Belotti, F., Conti, V., Cricelli, C., Kopinska, J., and Mortari, A. P. (2016). Modeling public health care expenditure using patient level data: Empirical evidence from Italy. CEIS Research Paper 367, Tor Vergata University, CEIS.
22. Atella, V., Belotti, F., Depalo, D., and Mortari, A. P. (2014). : Measuring spatial effects in presence of institutional constraints: the case of Italian Local Health Authority expenditure. Temi di discussione (Economic working papers) 967, Bank of Italy, Economic Research and International Relations Area.
23. Bartolucci, F., Belotti, F., and Peracchi, F. (2013). Testing for Time-Invariant Unobserved Heterogeneity in Generalized Linear Models for Panel Data. EIEF Working Papers Series 1312, Einaudi Institute for Economics and Finance (EIEF).
24. Atella, V., Belotti, F., Depalo, D., and Mortari, A. P. (2013). Measuring spatial effects in presence of institutional constraints: the case of Italian Local Health Authority expenditure. CEIS Research Paper 278, Tor Vergata University, CEIS.
25. Belotti, F., Daidone, S., Ilardi, G., and Atella, V. (2012). Stochastic frontier analysis using Stata. CEIS Research Paper 251, Tor Vergata University, CEIS.
26. Belotti, F. and Ilardi, G. (2012). Consistent Estimation of the "True" Fixed-effects Stochastic Frontier Model. CEIS Research Paper 231, Tor Vergata University, CEIS.
27. Atella, V., Belotti, F., Daidone, S., Ilardi, G., and Marini, G. (2012). Cost-containment policies and hospital efficiency: evidence from a panel of Italian hospitals. CEIS Research Paper 228, Tor Vergata University, CEIS.
28. Atella, V., Belotti, F., and Depalo, D. (2011). Drug therapy adherence and health outcomes in presence of physician and patient unobserved heterogeneity. CEIS Research Paper 186, Tor Vergata University, CEIS.

29. Arduini, D., Belotti, F., Denni, M., Giungato, G., and Zanfei, A. (2008). Technology Adoption and Innovation in Public Services. The Case of E-Government in Italy. Working Papers 0804, University of Urbino Carlo Bo, Department of Economics, Society & Politics - Scientific Committee - L. Stefanini & G. Travaglini.

### *Dormant research*

1. Atella, V., Belotti, F., Kopinska, J., Piano Mortari, A. "Health System Sustainability or Disease Eradication? Assessing the Economic Impact of New Treatments for Hepatitis C".
2. Belotti, F., Deb, P. "Minimum Density Power Divergence Estimation of  $m$ -Components Mixtures Regression Models"
3. Atella, V., Belotti, F., Depalo, D., Piano Mortari, A. "Instruments Selection in Spatial Panel Data Models".

### *Scientific Software*

*For unpublished Stata software type in the Stata command bar:*

net from <http://www.econometrics.it/stata>

1. Belotti, F. (2021). HETSAR: Stata module to estimate spatial autoregressive models with heterogeneous coefficients. Statistical Software Components, Boston College Department of Economics
2. Mladenovic, S. and Belotti, F. (2018). MVNXPB: Stata module for computation of multivariate normal probabilities using bivariate conditioning. Statistical Software Components, Boston College Department of Economics
3. Belotti, F., Borin, A., and Mancini, M. (2018). ICIO: Stata module for the analysis of Inter-Country Input-Output tables. Statistical Software Components, Boston College Department of Economics
4. Belotti, F. and Daidone, S. (2010). RUNNINGPROD: Stata Mata module to obtain the running product of a vector. Statistical Software Components, Boston College Department of Economics.
5. Belotti, F. and Ilardi, G. (2010). RTNORM: Stata Mata module to produce truncated normal pseudorandom variates. Statistical Software Components, Boston College Department of Economics.
6. Belotti, F. and Deb, P. (2012). TWOPM: Stata module to estimate two-part models. Statistical Software Components, Boston College Department of Economics.
7. Belotti, F., Hughes, G., and Mortari, A. P. (2013c). XSMLE: Stata module for spatial panel data models estimation. Statistical Software Components, Boston College Department of Economics.
8. Belotti, F., Daidone, S., Atella, V., and Ilardi, G. (2013a). SFCROSS: Stata module for cross-sectional stochastic frontier models estimation. Statistical Software Components, Boston College Department of Economics.
9. Belotti, F., Daidone, S., Atella, V., and Ilardi, G. (2013b). SFPANEL: Stata module for panel data stochastic frontier models estimation. Statistical Software Components, Boston College Department of Economics.
10. Belotti, F. (2013a). TIHTEST: Stata module to test for time invariant unobserved heterogeneity in GLMs for panel data. Statistical Software Components, Boston College Department of Economics.

11. Belotti, F. (2013b). TTAB: Stata module to produce formatted tables with t-test for two-groups mean-comparison. Statistical Software Components, Boston College Department of Economics.

## Conference and Seminar Presentations

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### *Estimation in Presence of Spatially Smooth Unobserved Heterogeneity*

Space and Growth: Theoretical and Empirical Models, Pisa, IT, December 14, 2019.

### *Finite sample properties of spatio-temporal models with strong and weak cross-sectional dependence*

The Economy as a Spatial Complex System (ESCoS), Naples, IT, June 22, 2018.

### *Estimation of stochastic frontier panel data models with spatial inefficiency*

59<sup>th</sup> Annual Conference of the Italian Economic Association (Special session organized by the Italian Econometric Association), Bologna, IT, October 27, 2018.

X<sup>th</sup> North American Productivity Workshop, Miami, FL, June 13, 2018.

### *Introducing the OECD-Schaeffer-CEIS Future Elderly Model*

6<sup>th</sup> World Congress of the International Microsimulation Association, Torino, IT, June 21, 2017.

XXII National Conference of the Italian Health Economics Association (AIES), Pavia, IT, Oct 5, 2017.

### *Drug Therapy Adherence and Health Outcomes in Presence of Physician and Patient Unobserved Heterogeneity*

Health Econometrics Workshop, Bari, IT, July 23, 2016.

### *Robust Stochastic Frontier Analysis: a Minimum Density Power Divergence Approach*

CSEF seminar, Napoli, IT, March 23, 2016.

Workshop on the Econometrics and Statistics of Efficiency Analysis: Recent Developments and Perspectives, Lecce, IT, June 21, 2015.

### *Consistent Inference in Fixed-effects Stochastic Frontier Models*

Italian Stata Users Group meeting, Milan, IT, November 13, 2014.

European Workshop on Efficiency and Productivity Analysis, Verona, IT, June 21, 2011.

### *Minimum Density Power Divergence Estimation of m-Components Mixtures Regression Models*

Italian Stata Users Group meeting, Florence, IT, November 14, 2013.

### *Stochastic Frontier Analysis using Stata*

Italian Stata Users Group meeting, Florence, IT, November 19, 2009.

### *Testing for Time-invariant Unobserved Heterogeneity in Generalized Linear Panel Data Models*

Fifth Italian Congress of Econometrics and Empirical Economics, Genova, IT, January 16, 2013.

Annual Health Econometrics Workshop, New York, NY, September 28, 2012.

Seminar, Department of Statistical Science, University of Padua, IT, March 29, 2012.

*The Role of Drug Adherence in Therapy Effectiveness: A Double Fixed-effects Approach*

Annual Health Econometrics Workshop, Detroit, MI, October 1, 2010.

## Professional Activities

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For peer review activity see my profile on [Publons](#).

## Teaching

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### University of Rome Tor Vergata:

Econometrics: [Fall 2018](#), [Fall 2019](#), [Fall 2020](#), [Fall 2021](#) (LM in Economics).

Microeconometrics: [Spring 2017](#), [Spring 2018](#), [Spring 2019](#), [Spring 2020](#) (LM in Economics).

Coding for Economic Applications: [Fall 2021](#) (LM in Economics).

Stata Programming for Microeconometrics (M.Sc. in Economics): Spring 2016.

Stochastic Frontier Analysis (ERASMUS Intensive Programme on Efficiency and Productivity Analysis): Summer 2014.

Introduction to Stata (M.Sc. in Development Economics): Spring 2011, Spring 2009.

### *PhD in Economics and Finance, University of Rome Tor Vergata*

Topics in Microeconometrics: Spring 2019, 2020

Microeconometrics using Stata: Spring 2018

### LUISS University:

Econometrics pre-course (Bachelor): Fall 2013, Fall 2012.

Stata pre-course (Bachelor): Spring 2012.

Macroeconomics (Bachelor): Fall 2008, TA for Giovanna Vallanti.

Econometrics and Statistics for Economics (Bachelor): Spring 2007, Fall 2007, TA for Professor Giovanna Vallanti.

## Professional Experience

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The World Bank, Consultant, Feb 2020–present.

University of Rome Tor Vergata, Centre for Economics and International Studies, Post Doctoral Researcher, February 2011–November 2016.

Food and Agriculture Organization of the United Nations, Empirical Analysis Specialist, March 2013–present.

Italian Society of General Practice, Empirical Analysis Specialist, September 2008–present.

Confcommercio, Research Assistant, May 2008–February 2009

Italian National Institute of Statistics, Researcher, September 2005–December 2008

## Miscellaneous

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**OS:** Linux, MacOSX, Windows (Server 2003/2008, 7, Vista, XP).

**Stat-programming:** Stata and Mata (advanced programming, certified), R (advanced), SAS (intermediate), SPSS (intermediate), Eviews (intermediate), Matlab (intermediate), C++ (intermediate), Octave (basic), Sage (Basic), Mathematica (basic), Maple (basic), Fortran90 (basic).

**Scripting:** BASH (advanced), Python (intermediate).

**Database:** MS Access, MySQL, MS SQL, PosgreSQL.

**Word processing:** MS Word, L<sup>A</sup>T<sub>E</sub>X.

**Presentation - drawing:** L<sup>A</sup>T<sub>E</sub>X beamer, Jupyter notebook, MS Powerpoint, Adobe Photoshop, Corel Draw.

**Web-Server:** Apache, Zope.

**Web Design:** PHP (basic), HTML, DHTML. Advanced use of Dreamweaver, Flash, Fireworks, MS Frontpage. Webmaster and Co-founder of the [econometrics.it](http://econometrics.it) and [sisper.istat.it](http://sisper.istat.it) web sites. Developer of the web-based interface to the Economics and Accounting student database and temporary maintenance of the CUNY (Economics) website.

**CMS:** Hugo, Plone, Joomla, WordPress.

Last updated: September 21, 2021