SDA Bocconi
SCHOOL OF MANAGEMENT

Emanuele Borgonovo

DECISION ANALYSIS

ARTICLES IN SCHOLARLY JOURNALS

BORGONOVO E., FIGALLI A., PLISCHKE E., SAVARÉ G.
Global Sensitivity Analysis via Optimal Transport
Management Science, 2024

BORGONOVO E., PLISCHKE E., RABITTI G.
The many Shapley values for explainable artificial intelligence: A sensitivity analysis perspective
European Journal of Operational Research, 2024, vol.318, no. 3, pp.911-926

BORGONOVO E., PLISCHKE E., PRIEUR C.
Total effects with constrained features
Statistics and Computing, 2024, vol.34, no. 2, pp.87

BORGONOVO E., CLEMENTE G. P., RABITTI G.
Why insurance regulators need to require sensitivity settings of internal models for their approval
Finance Research Letters, 2024, vol.60, pp.104859

BORGONOVO E., GHIDINI V., HAHN R., PLISCHKE E.
Explaining classifiers with measures of statistical association
Computational Statistics & Data Analysis, 2023, vol.182, pp.107701

HAZEN G., BORGONOVO E., LU X.
Information Density in Decision Analysis
Decision Analysis , 2023, vol.20, no. 2, pp.89-108

CAPPELLI F., TAURO F., APOLLONIO C., PETROSELLI A., BORGONOVO E., GRIMALDI S.
Feature importance measures to dissect the role of sub-basins in shaping the catchment hydrological response: a proof of concept
Stochastic Environmental Research and Risk Assessment, 2023, vol.37, no. 4, pp.1247-1264

BORGONOVO E., RABITTI G.
Screening: From tornado diagrams to effective dimensions
European Journal of Operational Research, 2023, vol.304, no. 3, pp.1200-1211

CHIARINI A., GRANDO A., VENTURINI S., BORGONOVO E.
Do automation and AI impact on job reduction? A study on perceived risk of losing job among white-collars in the Italian manufacturing companies
Production Planning & Control, 2023, pp.1-14

LU X., BORGONOVO E.
Global sensitivity analysis in epidemiological modeling
European Journal of Operational Research, 2023, vol.304, no. 1, pp.9-24

BORGONOVO E., LU X., RABITTI G.
Sensitivity Analysis of Pandemic Models Can Support Effective Policy Decisions
Journal of Computational and Graphical Statistics, 2023, vol.32, no. 3, pp.767-768

BORGONOVO E., PLISCHKE E., RABITTI G.
Interactions and computer experiments
Scandinavian Journal of Statistics, 2022, vol.49, no. 3, pp.1274-1303

VECCHI V., CUSUMANO N., CASADY C. B., GATTI S., BORGONOVO E.
Addressing Adverse Selection in Public-Private Partnership (PPP) Procurement: An Agent-Based Approach
Public Works Management & Policy, 2022, vol.27, no. 4, pp.371–395

BORGONOVO E., PANGALLO M., RIVKIN J., RIZZO L., SIGGELKOW N.
Sensitivity analysis of agent-based models: a new protocol
Computational and Mathematical Organization Theory, 2022, vol.28, no. 1, pp.52-94

BORGONOVO E., LI G., BARR J., PLISCHKE E., RABITZ H.
Global Sensitivity Analysis with Mixtures: A Generalized Functional ANOVA Approach
Risk Analysis, 2022, vol.42, no. 2, pp.304-333

LO PIANO S., BORGONOVO E., PUY A., SALTELLI A., WALSH J., VIDONI D.
Improving the reliability of cohesion policy databases
Plos One, 2022, vol.17, no. 4, pp.e0266823

PUY A., BORGONOVO E., LO PIANO S., LEVIN S. A., SALTELLI A.
Irrigated areas drive irrigation water withdrawals
Nature Communications, 2021, vol.12, no. 1

ZHU X., CHEN Z., BORGONOVO E.
Remaining-useful-lifetime and system-remaining-profit based importance measures for decisions on preventive maintenance
Reliability Engineering & System Safety, 2021, vol.216, pp.107951

BORGONOVO E., CASELLI S., CILLO A., MASCIANDARO D., RABITTI G.
Money, privacy, anonymity: What do experiments tell us?
Journal of Financial Stability, October, 2021, vol.56, pp.100934, 1-10

BORGONOVO E., HAZEN G. B., JOSE V. R. R., PLISCHKE E.
Probabilistic sensitivity measures as information value
European Journal of Operational Research, 2021, vol.289, no. 2, pp.595-610

RAZAVI S., JAKEMAN A., SALTELLI A., PRIEUR C., IOOSS B., BORGONOVO E., PLISCHKE E., LO PIANO S., IWANAGA T., BECKER W., TARANTOLA S., GUILLAUME J. H. A., JAKEMAN J., GUPTA H., MELILLO N., RABITTI G., CHABRIDON V., DUAN Q., SUN X., SMITH S., SHEIKHOLESLAMI R., HOSSEINI N., ASADZADEH M., PUY A., KUCHERENKO S., MAIER H. R.
The Future of Sensitivity Analysis: An essential discipline for systems modeling and policy support
Environmental Modelling & Software, 2021, vol.137, pp.104954

PLISCHKE E., RABITTI G., BORGONOVO E.
Computing Shapley Effects for Sensitivity Analysis
SIAM/ASA Journal on Uncertainty Quantification, 2021, vol.9, no. 4, pp.1411-1437

BORGONOVO E., MOLTENI L.
Gli advanced analytics a supporto delle decisioni manageriali
Economia & Management, 2021, no. 2, pp.25-29

PLISCHKE E., BORGONOVO E.
Fighting the Curse of Sparsity: Probabilistic Sensitivity Measures From Cumulative Distribution Functions
Risk Analysis, 2020, vol.40, no. 12, pp.2639-2660

RABITTI G., BORGONOVO E.
Is mortality or interest rate the most important risk in annuity models? A comparison of sensitivity

analysis methods
Insurance: Mathematics & Economics, 2020, vol.95, pp.48-58

BORGONOVO E., ANTONIANO-VILLALOBOS I., LU X.
Nonparametric estimation of probabilistic sensitivity measures
Statistics and Computing, 2020, vol.30, no. 2, pp.447-467

LU X., RUDI A., BORGONOVO E., ROSASCO L.
Faster Kriging: Facing High-Dimensional Simulators
Operations Research, 2020, vol.68, no. 1, pp.233-249

PLISCHKE E., BORGONOVO E.
Copula theory and probabilistic sensitivity analysis: Is there a connection?
European Journal of Operational Research, 2019, vol.277, no. 3, pp.1046-1059

RABITTI G., BORGONOVO E.
A Shapley-Owen Index for Interaction Quantification
SIAM/ASA Journal on Uncertainty Quantification, 2019, vol.7, no. 3, pp.1060-1075

ANTONIANO-VILLALOBOS I., BORGONOVO E., SIRIWARDENA S.
Which Parameters Are Important? Differential Importance Under Uncertainty
Risk Analysis, 2018, vol.38, no. 11, pp.2459-2477

BORGONOVO E., CILLO A., SMITH C. L.
On the Relationship between Safety and Decision Significance
Risk Analysis, 2018, vol.38, no. 8, pp.1541-1558

BORGONOVO E., BUZZARD G., WENDELL R. E.
A global tolerance approach to sensitivity analysis in linear programming
European Journal of Operational Research, 2018, vol.267, no. 1, pp.321-337

BORGONOVO E., MORRIS M. D., PLISCHKE E.
Functional ANOVA with Multiple Distributions: Implications for the Sensitivity Analysis of Computer Experiments
SIAM/ASA Journal on Uncertainty Quantification, 2018, vol.6, no. 1, pp.397-427

BORGONOVO E., CAPPELLI V., MACCHERONI F. A., MARINACCI M.
Risk analysis and decision theory: A bridge
European Journal of Operational Research, 2018, vol.264, no. 1, pp.280-293

BORGONOVO E., CILLO A.
Deciding with Thresholds: Importance Measures and Value of Information
Risk Analysis, 2017, vol.37, no. 10, pp.1828-1848

BORGONOVO E., LU X., PLISCHKE E., RAKOVEC O., HILL M. C.
Making the most out of a hydrological model data set: Sensitivity analyses to open the model black-box
Water Resources Research, 2017, vol.53, no. 9, pp.7933-7950

ALIEE H., BORGONOVO E., GLASS M., TEICH J.
On the Boolean extension of the Birnbaum importance to non-coherent systems
Reliability Engineering & System Safety, 2017, vol.160, pp.191-200

CILLO A., BORGONOVO E.
Deciding with Thresholds: Importance Measures and Value of Information
Risk Analysis, 2017, vol.37, no. 10, pp.1828-1848

BORGONOVO E., LAENGLE S., MERIGÓ J., MIRANDA J., SLOWINSKI R., BOMZE I., DYSON R., OLIVEIRA J., TEUNTER R.
Forty years of the European Journal of Operational Research: A bibliometric overview
European Journal of Operational Research, 2017, vol.262, no. 3, pp.803-816

BORGONOVO E., MARANGONI G., TAVONI M., BOSETTI V.

Sensitivity of projected long-term CO 2 emissions across the Shared Socioeconomic Pathways
Nature Climate Change, 2017, vol.7, no. 2, pp.113-117

DI MAIO F., NICOLA G., BORGONOVO E., ZIO E.
Invariant methods for an ensemble-based sensitivity analysis of a passive containment cooling system of an AP1000 nuclear power plant
Reliability Engineering & System Safety, 2016, vol.151, pp.12-19

BORGONOVO E., HAZEN G., PLISCHKE E.
A Common Rationale for Global Sensitivity Measures and Their Estimation
Risk Analysis, 2016, vol.36, no. 10, pp.1871-1895

BORGONOVO E., CUCURACHI S., HEIJUNGS R.
A Protocol for the Global Sensitivity Analysis of Impact Assessment Models in Life Cycle Assessment
Risk Analysis, 2016, vol.36, no. 2, pp.357-377

BORGONOVO E., ALIEE H., GLASS M., TEICH J.
A new time-independent reliability importance measure
European Journal of Operational Research, 2016, vol.254, no. 2, pp.427-442

BORGONOVO E., PLISCHKE E.
Sensitivity analysis: A review of recent advances
European Journal of Operational Research, 2016, vol.248, no. 3, pp.869-887

BECCACECE F., BORGONOVO E., BUZZARD G., CILLO A., ZIONTS S.
Elicitation of multiattribute value functions through high dimensional model representations: Monotonicity and interactions
European Journal of Operational Research, 2015, vol.246, no. 2, pp.517-527

BORGONOVO E., MARINACCI M.
Decision analysis under ambiguity
European Journal of Operational Research, 2015, vol.244, no. 3, pp.823-836

BECCACECE F., BORGONOVO E., BUZZARD G., CILLO A., ZIONTS S.
Elicitation of Multiattribute Value Functions through High Dimensional Model Representations: Monotonicity and Interactions
European Journal of Operational Research, 2015, vol.246, no. 2, pp.517-527

BORGONOVO E., TARANTOLA S., PLISCHKE E., MORRIS M.
Transformations and invariance in the sensitivity analysis of computer experiments
The Journal of The Royal Statistical Society, Series B (Statistical Methodology), 2014, vol.76, no. 5, pp.925-947

BORGONOVO E., ANDERSON B., GALEOTTI M., ROSON R.
Uncertainty in Climate Change Modeling: Can Global Sensitivity Analysis Be of Help?
Risk Analysis, 2014, vol.34, no. 2, pp.271-293

ZENTNER I., BORGONOVO E.
Construction of variance-based metamodels for probabilistic seismic analysis and fragility assessment
Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards, 2014, vol.8, no. 3, pp.202-216

BORGONOVO E., TONOLI F.
Decision-network polynomials and the sensitivity of decision-support models
European Journal of Operational Research, 2014, vol.239, no. 2, pp.490-503

BORGONOVO E.
Quando ai manager danno i numeri
Economia & Management, 2014, no. 3, pp.108-111

CEPPI A., RAVAZZANI G., SALANDIN A., RABUFFETTI D., MONTANI A., BORGONOVO E., MANCINI M.
Effects of temperature on flood forecasting: Analysis of an operative case study in Alpine basins

Natural Hazards and Earth System Sciences, 2013, vol.13, no. 4, pp.1051-1062

PLISCHKE E., BORGONOVO E., SMITH C.
Global sensitivity measures from given data
European Journal of Operational Research, 2013, vol.226, no. 3, pp.536-550

BAUCELLS M., BORGONOVO E.
Invariant Probabilistic Sensitivity Analysis
Management Science, 2013, vol.59, no. 11, pp.2536-2549

BORGONOVO E., ZENTER I., PELLEGRI A., TARANTOLA S., DE ROCQUIGNY E.
On the importance of uncertain factors in seismic fragility assessment
Reliability Engineering & System Safety, 2013, vol.109, no. -, pp.66-76

BORGONOVO E., GATTI S.
Risk Analysis with contractual default. Does Covenant Breach Matter?
European Journal of Operational Research, 2013, vol.230, no. 2, pp.431-443

BORGONOVO E., SMITH C.
Composite multilinearity, epistemic uncertainty and risk achievement worth
European Journal of Operational Research, 2012, vol.222, no. 2, pp.301-311

BORGONOVO E., CASTAINGS W., TARANTOLA S.
Model emulation and moment-independent sensitivity analysis: An application to environmental modeling
Environmental Modelling & Software, 2012, vol.34, pp.105-115

CASTANINGS W., BORGONOVO E., MORRIS M., TARANTOLA S.
Sampling strategies in density-based sensitivity analysis
Environmental Modelling & Software, 2012, vol.38, pp.13-26

BECCACECE F., BORGONOVO E.
Functional ANOVA, ultramodularity and monotonicity: Applications in multiattribute utility theory
European Journal of Operational Research, 2011, vol.210, no. 2, pp.326-335

BORGONOVO E., SMITH C.
A Study of Interactions in the Risk Assessment of Complex Engineering Systems: an Application to Space PSA
Operations Research, 2011, vol.59, no. 6, pp.1461-1476

BIAVA P., BASEVI M., BIGGIERO L., BORGONOVO A., BORGONOVO E., BURIGANA F.
Cancer cell reprogramming, 2010: stem cell differentiation stage factors and an agent based model to optimize cancer treatment
Current Pharmaceutical Biotechnology, 2011, vol.12, no. 2, pp.231-242

BORGONOVO E., PECCATI L.
Finite Change Comparative Statics for Risk-Coherent Inventories
International Journal of Production Economics, 2011, vol.131, no. 1, pp.52-62

BECCACECE F., BORGONOVO E.
Function decomposition, monotonicity and ultramodularity: applications to multi-attribute utility theory
European Journal of Operational Research, 2011, vol.210, no. 2, pp.326-335

BORGONOVO E., CAVALLI L., GUALDONI D., IOZZI F., SODA G., GERMANI A., GOLLIN G.
La progettazione dei sistemi di incentivazione del personale. Un modello sperimentale
Economia & Management, 2011, no. 5, pp.49-66

BORGONOVO E., PECCATI L.
Managerial Insights from Service Industry Models: A New Scenario Decomposition Method
Annals of Operations Research, 2011, vol.185, no. 1, pp.161-179

BORGONOVO E., CASTAINGS W., TARANTOLA S.
Moment Independent Importance Measures: New Results and Analytical Test Cases

Risk Analysis, 2011, vol.31, no. 3, pp.404-428

BORGONOVO E., PERCOCO M.
Sensitivity Analysis of Portfolio Properties with Budget Constraints
International Journal of Mathematics in Operational Research, 2011, vol.3, no. 3, pp.295-321

BORGONOVO E.
The reliability importance of components and prime implicants in coherent and non-coherent systems including total-order interactions
European Journal of Operational Research, 2010, vol.204, no. 3, pp.485-495

BORGONOVO E., GATTI S., PECCATI L.
What drives value creation in investment projects? An application of sensitivity analysis to project finance transactions
European Journal of Operational Research, 2010, vol.205, no. 1, pp.227-236

BORGONOVO E., PECCATI L.
Moment calculations for piecewise-defined functions: an application to stochastic optimization with coherent risk measures
Annals of Operations Research, 2010, vol.176, no. 1, pp.235-258

BORGONOVO E.
A Methodology for Determining Interactions in Probabilistic Safety Assessment Models by Varying One Parameter at a Time
Risk Analysis, 2010, vol.30, no. 3, pp.385-399

BORGONOVO E.
Sensitivity analysis with finite changes: An application to modified EOQ models
European Journal of Operational Research, 2010, vol.200, no. 1, pp.127-138

BECCACECE F., BORGONOVO E.
Brand valuation: a comparison of alternative models
International Journal of Operational Research, 2009, vol.6, no. 2, pp.247-266

BORGONOVO E.
Sensitivity analysis of multinomial decision trees
International Journal of Mathematics in Operational Research, 2009, vol.1, no. 1/2, pp.121

RESEARCH MONOGRAPHS

BORGONOVO E.
Sensitivity analysis: an introduction for the management scientist
Springer International Publishing, , 2017

EDITED BOOKS

MOLTENI L., BORGONOVO E. (EDS.)
Quando ai manager danno i numeri . Come prendere decisioni nell'era dei big data
Egea, Milano, Italy, 2020

TEXTBOOKS

BORGONOVO E., FEIN D., POLI E., VENTURINI S.
Principles of Business Analytics
Bocconi University Press - BUP, Milano, Italy, 2024

CONTRIBUTION TO CHAPTERS, BOOKS OR RESEARCH MONOGRAPHS

BORGONOVO E.
Sensitivity Analysis in *Tutorials in Operations Research: Advancing the Frontiers of OR/MS: From Methodologies to Applications*
Ebru Bish, Hari Balasubramanian, Douglas Shier, Harvey J. Greenberg(Ed), INFORMS, pp.52-81, 2023

BORGONOVO E.
Mind the assumptions: Quantify uncertainty and assess sensitivity in *The Politics of Modelling: Numbers Between Science and Policy*
Andrea Saltelli, Monica Di Fiore(Ed), Oxford University Press, pp.69-82, 2023

BORGONOVO E., IOOSS B.
Moment-Independent and Reliability-Based Importance Measures in *Handbook of Uncertainty Quantification*
Roger Ghanem, David Higdon, Houman Owhadi (Eds),Springer International Publishing, pp.1-23, 2015

ARTICLES IN NATIONAL/INTERNATIONAL NEWSPAPERS

BORGONOVO E., CASELLI S., CILLO A., MASCIANDARO D., RABITTI G.
Central bank digital currencies, cryptocurrencies, and privacy: What experiments tell us
VoxEU - CEPR, 28 October, 2021

BORGONOVO E., CASELLI S., CILLO A., MASCIANDARO D., RABITTI G.
Money, digital cash and cryptocurrencies: Privacy matters
VoxEU - CEPR, 12 March, 2019

EDITORIALS IN JOURNAL

BORGONOVO E., BUSACCA B., SODA G.
L'onda dei Big Data: minaccia o opportunità
2015, Economia & Management, Milano, Italy

BORGONOVO E., TARANTOLA S.
Advances in Sensitivity Analysis
2012, Reliability Engineering & System Safety, Netherlands (The)

ENTRY (IN DICTIONARY OR ENCYCLOPEDIA)

BORGONOVO E.
Sensitivity Analysis in Decision Making in *Wiley Encyclopedia of Operations Research and Management Science*
J. J. Cochran, L. A. Cox, Jr. Pinar Keskinocak, J. P. Kharoufeh, J. C. Smith(Ed), John Wiley & Sons, pp.1076–1076, 2013

INTERVIEW ARTICLES

BORGONOVO E., BUSACCA B.
Big Data: il presente e il futuro secondo Cisco, Facebook, IBM, HP e Oracle
2015, Economia & Management, Milano, Italy

OTHER

BORGONOVO E., GRANDO A.
The arrival of AI in the company is less of a scare for white collars
2024, Via Sarfatti 25, Milano, Italy

PROCEEDINGS/PRESENTATIONS

BORGONOVO E., BAUCELLS M., BARR J., PLISCHKE E., RABITZ H.
On the Properties of Graphical Tools
Advances in Decision Analysis Conference (ADA 2022), June 22-24, 2022, Washington D.C., United States of America

CILLO A., ULU C., BORGONOVO E., ORTIS A., BATTIATO S.
Should Advisors Signal Access to Algorithms?
Advances in Decision Analysis Conference (ADA 2022), June 22-24, 2022, Washington D.C., United States of America

CILLO A., ULU C., BORGONOVO E., ORTIS A., BATTIATO S.
Should Advisors Signal Access to Algorithms?
FUR Conference, July 11-14, 2022, Ghent, Belgium

BORGONOVO E., SMITH C.
Importance measures with finite changes: the relationship between Fussell-Vesely and total order reliability importance
20th European Safety and Reliability Conference, ESREL 2011, Advances in Safety, Reliability and Risk Management - September 18-22, 2012, Troyes, France

BORGONOVO E., SMITH C.
Uncertainty in importance measures: Developing the epistemic Risk Achievement Worth
20th European Safety and Reliability Conference, ESREL 2011, Advances in Safety, Reliability and Risk Management - September 18-22, 2012, Troyes, France

BORGONOVO E., ANDERSON B., ROSON R., GALEOTTI M.
Global Sensitivity Analysis and the Economics of Climate Change
6th International Congress on Environmental Modelling and Software (iEMSs) - July 1-5, 2012, Leipzig, Germany

BORGONOVO E., PECCATI L.
Value of Information in the Appraisal of Industrial Investments

17th International Working Seminar on Production Economics - February 20-24, 2012, Innsbruck, Austria

BORGONOVO E., BAUCELLS M.
Probabilistic Sensitivity of Uncertain Cash Flow Streams
INFORMS Annual Meeting Proceedings - November 13-16, 2011, Charlotte, North Carolina, United States of America

ZENTNER I., BORGONOVO E., TARANTOLA S.
Use of HDMR metamodel for seismic fragility analysis
Applications of Statistics and Probability in Civil Engineering. Proceedings of the 11th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP11) - August 1-4, 2011, Zürich, Switzerland

RESEARCH NOTES OR SHORT ARTICLES IN JOURNALS

PERCOCO M., BORGONOVO E.
On the Sensitivity Analysis of Internal Rates of Return
2012, International Journal of Production Economics, United States of America

RESEARCH REPORTS

BORGONOVO E., POLETTI C.
Aspetti Economici
2011, Fondazione Energy Lab – Laboratorio dell'Energia, Italy

WORKING PAPERS

CASELLI S., BORGONOVO E., CILLO A., MASCIANDARO D.
Beyond Bitcoin and Cash: Do We Would Like a Central Bank Digital Currency? A Financial and Political Economics Approach
2017, SSRN Electronic Journal