

Accepted Manuscript

Upper and lower conditional probabilities induced by a multivalued mapping

Davide Petturiti, Barbara Vantaggi

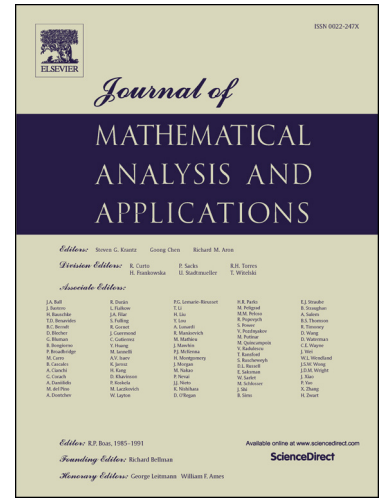
PII: S0022-247X(17)30895-8
DOI: <https://doi.org/10.1016/j.jmaa.2017.10.006>
Reference: YJMAA 21724

To appear in: *Journal of Mathematical Analysis and Applications*

Received date: 23 January 2017

Please cite this article in press as: D. Petturiti, B. Vantaggi, Upper and lower conditional probabilities induced by a multivalued mapping, *J. Math. Anal. Appl.* (2018), <https://doi.org/10.1016/j.jmaa.2017.10.006>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Upper and lower conditional probabilities induced by a multivalued mapping

Davide Petturiti^a, Barbara Vantaggi^{b,*}

^a*Dip. Economia, Università degli Studi di Perugia, Italy*

^b*Dip. S.B.A.I., "La Sapienza" Università di Roma, Italy*

Abstract

Given a (finitely additive) full conditional probability space $(X, \mathcal{F} \times \mathcal{F}^0, \mu)$ and a conditional measurable space $(Y, \mathcal{G} \times \mathcal{G}^0)$, a multivalued mapping Γ from X to Y induces a class of full conditional probabilities on $(Y, \mathcal{G} \times \mathcal{G}^0)$. A closed form expression for the lower and upper envelopes μ_* and μ^* of such class is provided: the envelopes can be expressed through a generalized Bayesian conditioning rule, relying on two linearly ordered classes of (possibly unbounded) inner and outer measures. For every $B \in \mathcal{G}^0$, $\mu_*(\cdot|B)$ is a normalized totally monotone capacity which is continuous from above if $(X, \mathcal{F} \times \mathcal{F}^0, \mu)$ is a countably additive full conditional probability space and \mathcal{F} is a σ -algebra. Moreover, the full conditional prevision functional \mathbf{M} induced by μ on the set of \mathcal{F} -continuous conditional gambles is shown to give rise through Γ to the lower and upper full conditional prevision functionals \mathbf{M}_* and \mathbf{M}^* on the set of \mathcal{G} -continuous conditional gambles. For every $B \in \mathcal{G}^0$, $\mathbf{M}_*(\cdot|B)$ is a totally monotone functional having a Choquet integral expression involving μ_* . Finally, by considering another conditional measurable space $(Z, \mathcal{H} \times \mathcal{H}^0)$ and a multivalued mapping from Y to Z , it is shown that the conditional measures μ_{**} , μ^{**} and functionals \mathbf{M}_{**} , \mathbf{M}^{**} induced by μ_* preserve the same properties of μ_* , μ^* and \mathbf{M}_* , \mathbf{M}^* .

Keywords: Multivalued mapping, totally monotone capacity, probability envelopes, finite additivity, lower conditional prevision

2010 MSC: 60A05, 62C10, 60A10

1. Introduction

Let (X, \mathcal{F}, μ) be a finitely additive probability space and (Y, \mathcal{G}) a measurable space, where both \mathcal{F} and \mathcal{G} are algebras (not necessarily σ -algebras) of subsets of X and Y , respectively. Throughout the paper we consider arbitrary non-empty sets without requiring any topological structure.

*Corresponding author.

Email addresses: davide.petturiti@unipg.it (Davide Petturiti), barbara.vantaggi@sbai.uniroma1.it (Barbara Vantaggi)

Download English Version:

<https://daneshyari.com/en/article/8900285>

Download Persian Version:

<https://daneshyari.com/article/8900285>

[Daneshyari.com](https://daneshyari.com)