Pricing of CDO's Based on the Multivariate Wang Transform *

Masaaki Kijima[a†], Shin-ichi Motomiya[b] and Yoichi Suzuki[b]

[a] *Tokyo Metropolitan University/ Kyoto University*

[b] *Credit Pricing Corporation, Ltd.*

(This Version: August 22, 2008)

(First Version: March 15, 2008)

Abstract. This paper shows that the one-factor Gaussian copula model, the standard market model for valuing CDO's, can be derived from the multivariate Wang transform, which is consistent with Bühlmann's equilibrium pricing model, whence it has a *sound* economic interpretation. The Gaussian copula model is then extended within the Bühlmann's framework. Unlike the existing models, our model calibrates the parameter associated with risk aversion index of the representative investor, not the correlation parameter. A t-copula model is also considered to describe the fat-tail distribution observed in the actual markets.

Keywords. One-factor Gaussian copula model, Merton's structural model, Bühlmann's economic premium principle, multivariate Wang transform, Student t distribution.

---

*A previous version of this paper was presented at the 2nd Risk Management Conference held in Singapore on July 1, 2008. The authors are grateful to participants of the conference for helpful discussions. Numerical assistance by Dr. Yasuhiro Tamba of Credit Pricing Corporation, Ltd. is also acknowledged.

†Corresponding author: Graduate School of Social Sciences, Tokyo Metropolitan University, 1-1 Minami-Ohsawa, Hachiohji, Tokyo 192-0397, Japan. TEL:+81-42-677-2330, FAX:+81-42-677-2298, E-mail: `kijima@center.tmu.ac.jp`