

Accepted Manuscript

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C. Gourieroux, A. Monfort, J.P. Renne

PII: S0304-4076(14)00108-0

DOI: <http://dx.doi.org/10.1016/j.jeconom.2014.05.005>

Reference: ECONOM 3919

To appear in: *Journal of Econometrics*



Please cite this article as: Gourieroux, C., Monfort, A., Renne, J.P., Pricing default events : Surprise, exogeneity and contagion. *Journal of Econometrics* (2014), <http://dx.doi.org/10.1016/j.jeconom.2014.05.005>

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Pricing Default Events : Surprise, Exogeneity and Contagion*

C., GOURIEROUX ⁽¹⁾, A. MONFORT ⁽²⁾, and J.P., RENNE ⁽³⁾

(January, 2013, revised October, 2013)

Abstract: In order to derive closed-form expressions of the prices of credit derivatives, standard credit-risk models typically price the default intensities, but not the default events themselves. The default indicator is replaced by an appropriate prediction and the prediction error, that is the default-event surprise, is neglected. Our paper develops an approach to get closed-form expressions for the prices of credit derivatives written on multiple names without neglecting default-event surprises. This approach differs from the standard one, since the default counts necessarily cause the factor process under the risk-neutral probability, even if this is not the case under the historical probability. This implies that the standard exponential pricing formula of default does not apply. Using U.S. bond data, we show that allowing for the pricing of default events has important implications in terms of both data-fitting and model-implied physical probabilities of default. In particular, it may provide a solution to the credit spread puzzle. Besides, we show how our approach can be used to account for the propagation of defaults on the prices of credit derivatives.

Keywords: Credit Derivative, Default Event, Default Intensity, Frailty, Contagion, Credit Spread Puzzle.

JEL Codes: E43, E47, G12.

*The views expressed in this paper are those of the authors and do not necessarily reflect those of the Banque de France and of the Autorité de Contrôle Prudentiel. We are grateful to Alok Bhargava, Caio Almeida and two anonymous referees for insightful comments and suggestions; we also thank participants at the TSE Financial Econometrics conference and at FEBS/ LabEx ReFi 2013 Conference. The first author gratefully acknowledges financial support of the Chair ACP/Risk Foundation: "Regulation and Systemic Risk", and of the Global Risk Institute.

¹CREST, and University of Toronto.

²CREST, Banque de France, and University of Maastricht.

³Corresponding author. Banque de France. e-mail: jean-paul.renne@m4x.org

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