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**TESTING WEAK EXOGENEITY IN THE EXPONENTIAL
FAMILY: AN APPLICATION TO FINANCIAL POINT
PROCESSES**

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Abstract

In this paper, two tests for weak exogeneity in the econometric modelling of financial point processes are proposed. They are motivated by the common practice in many econometric studies of tick-by-tick data of making inference on the joint density of durations and marks through the conditional (marks given durations) density. However, this inference is only valid if the process of the marginal (durations) is weakly exogenous for the parameters of the conditional density, a hypothesis which is often left untested. Under standard pseudo-maximum likelihood conditions, we first derive a simple parametric score/LM test statistic when the potential dependence between the parameters of interest in the conditional model and the marginal process is assumed to be linear. Next, an alternative consistent test is proposed when the functional form of the dependence is left unspecified. To illustrate the use of these tests, we analyze two types of financial point processes, linked with market microstructure theory and stealth trading hypothesis, for five stocks traded at NYSE: (i) the relationship between trade size and trade durations and (ii) the relationship between volume and price durations. In general we reject the null hypothesis of weak exogeneity, therefore questioning some results in the literature which rely on separate estimation of each density.

Keywords: weak exogeneity, pseudo-maximum likelihood, semiparametric models, point processes, high-frequency data, stealth trading, mixture of distribution hypothesis.

JEL Classification: C12, C41, C52, G10.

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