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**Original Articles** 

## Spillovers and correlations between US and major European stock markets: the role of the euro

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## Acknowledgements

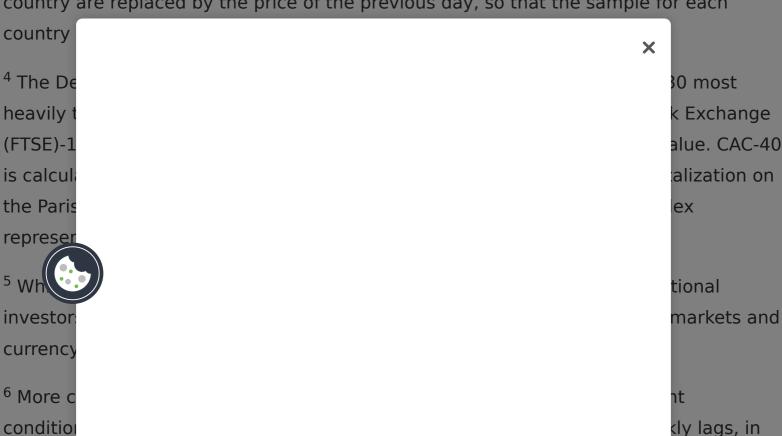
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## Notes

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- <sup>1</sup> Milunovich and Thorp (2006) also use pseudo-closing prices.
- <sup>2</sup> The 16:00 London time is equal to 16:00 Greenwich Mean Time (GMT) in winter and 15:00 GMT in summer. It corresponds to 11:00 New York time, apart for a short period around the change to daylight saving time in the UK.
- <sup>3</sup> The data is extracted from DataStream. Missing observations for holidays in each country are replaced by the price of the previous day, so that the sample for each



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<sup>7</sup> In principle, we would like to allow the possibility of cross-market persistency effects, which would imply including terms for  $j \neq i$  in (2). However, the addition of these terms resulted in convergence problems in estimation and hence they are excluded from our model.

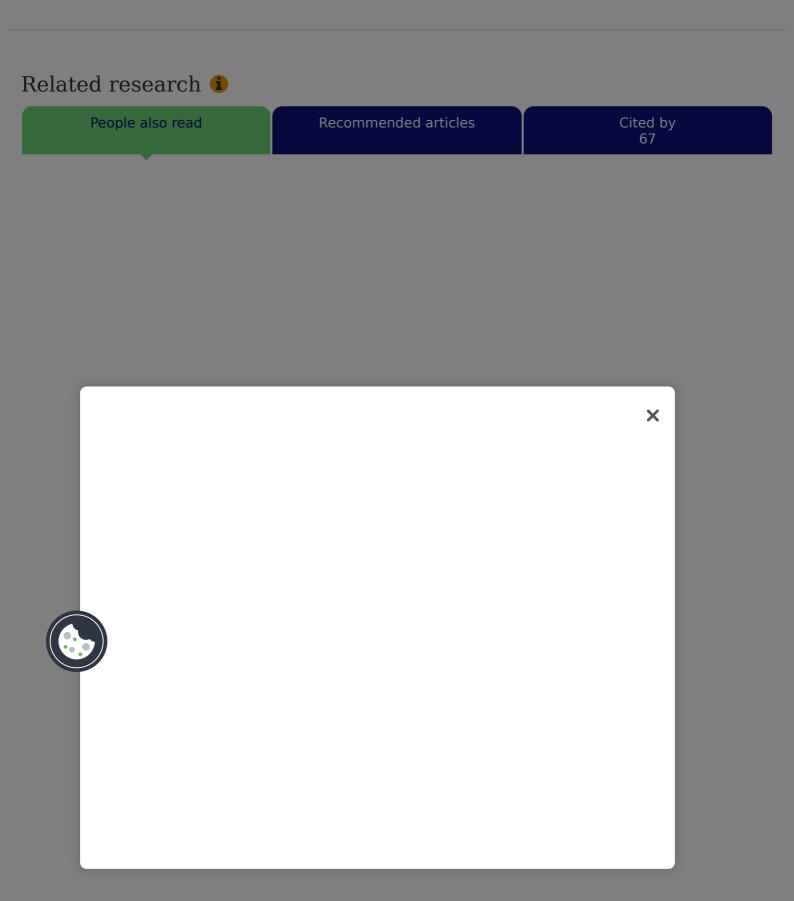
- <sup>8</sup> This condition was checked for all estimated models and found to be satisfied.
- <sup>9</sup> The specification of van Dijk et al. (2006) assumes an instantaneous change in the unconditional correlation. The formulation in ( $\underline{5}$ ), on the other hand, implies a smooth change in the unconditional correlations; see van Dijk et al. (2006).
- <sup>10</sup> The reported single step estimation results were compared with two-step estimates, where the DCC parameters are estimated conditional on those of the mean and volatility equations. Qualitatively similar results were obtained for all estimated coefficients and their SEs, except that the SEs for all DCC coefficients were smaller using the single step estimation.

<sup>11</sup> In addition to the actual introduction of the euro, various other dates were

considered (including the Dublin Declaration in December 1996 and the May 1998 announcement of the countries that would adopt the euro). However, based on the likelihood ratio tests, there is no significance change at these dates. Moreover, the use relations of a smo X ates. These occurred results a <sup>12</sup> We al k in January 1999. Th onding mean D 13 At th ole only for 16:0 r and how the appa s are measure <sup>14</sup> We ar this point. 15 The re easured by

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<sup>16</sup> It might be noted that the most notable sharp decline in the correlation between Germany and the US in Fig. 1 reflects the impact of the terrorist attacks of 9/11 and our treatment of 'holidays'. In particular, because the New York market was closed subsequent to the attacks, and we replaced these missing values by the last available observation, the decline recorded by other markets is not reflected in New York. A similar decline also occurs for New York with Frankfurt, but is less marked for London and New York.



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