
*Corresponding author

we analyze the variance-covariance

The Italian electronic broker market replaced the entire existing domestic overnight market in the Euro area in being a screen based market. Interbank trades are largely bilateral and foreign banks can exchange funds. There were 196 in 2000, 183 in 2001 and 177 in 2002. Their quotes to facilitate credit lines. The trade is finalized if the ordering bank accepts the offer or a bid. An offer indicates the

decreasing to zero thereafter. Here the superscript i denotes the bank, v_i shows the signed trading volume, and z_i there some banks that follow carry trade strategies. A structural break clearly shows their trading behaviour. This change coincides with the official and market interest rate becoming negative at the beginning of 2001, in a reduction in the ECB interest rate on 30 August 2001. Furthermore, the ECB Central Bank increased in the sum

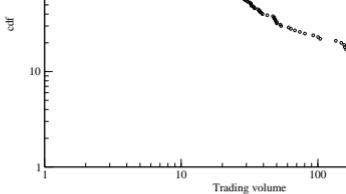


Figure 2: Cumulative distribution of trading volume (right) across banks.

is model-free, and it produces very good results. It handles the time series in their original form, without discarding. The estimator is based on the Fourier coefficients, thus it is well suited for high-frequency data. It has a natural interpretation in terms of the spectral density, and it takes care of, given banks' different frequencies, to perform much better than the traditional methods (see, e.g., 2003; Precup and Iori, 2004). It has been used in the presence of microstructure noise (see, e.g., 2002a,b), stock prices (see, e.g., 2002a,b), and Renò, 2002a,b), stock prices

We finally check whether there is strategies over the maintenance period, and average those which known that the behavior of bank et al., 2003; Iori et al., 2005).

We find that the first eigenvalue maintenance period, see Figure 7. On value, shown in the inset of figure

In the very first day of the maintenance the strategies. Coordination incre

departing from bank number 103 of figure 8. In figure 10 we plot the results according to the hierarchical tree where distinct groups appear.

More sophisticated techniques for the last few years (Radicchi et al. 2004; Newman, 2003; Duch and J. based on the edge betweenness in

¹For visualizations we used Graphviz (Kawai, 1989).

correlation matrix. In particular, $L = K - A$ and the Normal matrix elements $k_{ii} = \sum_{j=1}^n a_{ij}$ and n is the number of vertices. Concerning undirected networks, it is always the largest eigenvalue equal to one with an apparent cluster structure of eigenvalues close to one, where the remaining eigenvalues lying a gap away from the first $m - 1$ nontrivial eigenvalues indicate the position of the i -th vertex of the component in one eigenvector.

Figure

Figure 10: Banks are order

References

- Angelini, P. (2000). Are banks risk market. *Journal of Money, Credit and Banking*, 32(1), 1–15.
- Barucci, E., C. Impenna, and R. Renò (2002). Market microstructure effects, the martingale hypothesis and the term structure. *Bank of Italy Quarterly Review*, N. 475.
- Barucci, E. and R. Renò (2002a). Market microstructure effects on bond returns performance. *Journal of International Money and Finance*, 21, 183–200.

Laloux, L., P. Cizeau, J.-P. Bouchaud
correlation matrices. *Physical A*

Malliavin, P. and M. Mancino (2005).
variate volatilities. *Finance & Economics*

Mancino, M. and R. Renò (2005).
volatility via Fourier analysis.

Mantegna, R. N. and H. E. Stanley
University Press.

