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Price determinants of American Depositary Receipts (ADR): a cross-sectional analysis of panel data

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Abstract

Evidence on ADR price discovery is provided using data for a large sample from 13 different countries for the period 1990 to 2000. Using Seemingly Unrelated Regression (SUR) and Feasible Generalized Least Squares (FGLS) models that incorporate both contemporaneous and lagged factors as exogenous variables in a cross-sectional panel data the findings indicate that movements in the underlying shares are the most influential factor affecting ADR prices. Further and contrary to the evidence provided in previous studies, the findings suggest that changes in the exchange rate significantly influence ADR prices. The results confirm previous findings that ADR price discovery occurs in the US stock market where they are listed and traded. Although, innovations in the home stock market do contribute to the ADR price discovery, its impact is not as strong as the one found for the innovations in the US stock market.

Notes

[1] See the Bank of New York (BNY, 2002).

[2] See Verbeek (2000) for an explanation of the advantages of using panel data in financial analysis.

[3] The term closing prices refers to the previous day's closing price, adjusted for subsequent capital actions (i.e. bonus and right issues).

[4] Japan and Australia are the second and third biggest issuers of Depository Receipt programs.

[5] Industry (global or local), country (developed or emerging), and global (crude oil, seasonal dummies, etc.) factors have not been considered because prior research suggests that these do not have much explanatory power in explaining ADR returns (Choi and Kim, 2000; Kumar Patro, 2000).

[6] The SUR/FGLS estimator was popularised by Kmenta (1986) and is therefore also referred to as Parks-Kmenta or Kmenta's “cross-sectionally correlated and time-wise autoregressive” model. The conditional unbiasedness of the SUR/FGLS estimator was proven by Kakwani (1967).

[7] All Australian companies are estimated jointly, all Japanese companies are estimated jointly, etc. Grouping of stocks by the country of origin of the underlying share is preferred because the return generating process is strongly affected by the country factor (Eun and Resnick, 1984).

[8] See Judge et al . (1985, p. 946) for explanation of Kronecker product matrix theorem.

[9] The Wald test is applied on the US and the home stock market coefficients derived from the SUR/FGLS estimation to test the joint restriction that the S&P500 and the home market jointly do not constitute a significant source of risk for ADRs (H_0: $\varphi = \gamma = 0$). Failure to reject the null hypothesis would indicate that the model overestimates ADR returns and that it would be better to model using the changes in the underlying

shares and exchange rates. Further, to test for consistency we estimate Equation 3 on three sample sub-periods (1990–1993, 1994–1996 and 1997–2000).

[10] Test for panel heteroskedasticity and cross-sectional correlation were not conducted on countries for which we only have one ADR issuing firm (Denmark, Finland, France, and Norway). OLS is reported with heteroscedasticity consistent standard errors and covariance results which are equivalent to SUR/FGLS estimation with just one cross-section in the pool (Kmenta, 1986). These cases are indicated in the result tables as OLS-HCSEC in the row representing the number of cross-sections used in estimation.

[11] Equation 3 was also estimated with exchange rate, the US and the home stock market index orthogonalized on each other for the full sample period with an aim to remove influence of the exchange rate on both market index. Results were consistent with those reported in Table 2.

[12] Although our estimation procedure is generally robust to non-synchronous trading, the observed underreaction to the underlying share and exchange rate and overreaction the US and home stock market indexes could be due to: (a) herd behaviour, (b) arbitrageurs, (c) access to investment information, and (d) convertibility of ADRs to underlying share.

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