Online Appendix: Sample selection of non-U.S. stocks

This appendix explains the procedure we use to construct the non-U.S. sample.

Step 1: Retrieve summary statistics of analysts' earnings forecasts for international firms from the I/B/E/S summary file.

There are two types of summary files in I/B/E/S: an adjusted file (file name: *STATSUM_EPSINT* in WRDS) and an unadjusted file (file name: *STATSUMU_EPSINT* in WRDS). Following Diether et al. (2002), we rely on the summary statistics from the unadjusted file to calculate forecast dispersion in order to avoid the problems caused by I/B/E/S adjustment for stock splits. However, the unadjusted file does not include actual earnings-per-share (EPS), which is a variable needed to calculate forecast bias. Actual EPS (after adjustment for stock splits) is included in the adjusted file. Hence, we need to match the unadjusted summary forecast statistics with the adjusted actual EPS and make sure they are on the same scale with respect to stock splits. To achieve this, we follow the method in Glushkov (2009). Specifically, we merge the unadjusted file with the adjusted file to back out the split factor, with which we obtain the unadjusted actual EPS. In this matching process, it is important to ensure that the currency code of forecast statistics (*CURCODE* in I/B/E/S) is the same as the currency code of actual EPS (*CURR_ACT* in I/B/E/S). We focus on current fiscal-year annual EPS forecasts (i.e., *FPI* =1 in I/B/E/S). This process results in 2,469,933 firm-month observations with no missing unadjusted actual EPS whose forecast statistic dates (*STATPERS* in I/B/E/S) fall between January 1990 and November 2013 from the I/B/E/S universe. Our sample starts in January 1990 because Datastream begins to provide stock return data for a large number of international firms in 1990. Our sample ends in November 2013 because forecast statistics will later be matched with the following month's return, which ends in December 2013 (i.e., the last month of our return data).

Step 2: Match the I/B/E/S identifier *TICKER* with the Datastream identifier *DSCD*.

TICKER is the unique identifier for each firm in I/B/E/S, and *DSCD* is the unique six-digit identifier for each stock. Among the 2,469,933 firm-month observations retrieved in step 1, there are 34,415 unique *TICKERs*. We create a list based on the 34,415 *TICKERs* and then retrieve the corresponding *DSCD* for each *TICKER* from Datastream. Each of 34,415 *TICKERs* is matched with one unique *DSCD*. However, there is one case where one *DSCD* (= 14653D) is associated with two *TICKERs*. We manually check this case and choose the correct match. Therefore, we obtain 34,414 unique *TICKER-DSCD* matches. It's important to note that in this matching process, we search *DSCD* for *TICKER* because this process normally results in a firm's primarily listed stock. If we reverse this process (i.e., searching *TICKER* for *DSCD*), one *TICKER* is often matched with different *DSCD*s when a firm has several listings.

Step 3: Select stocks meeting our criteria.

The 34,414 stocks in step 2 are from 92 countries. Unless otherwise specified, we identify a stock's country based on the location of its primary exchange (*GEOLN* in Datastream). Among these

92 countries, many countries will not have enough observations to calculate a reliable dispersion effect, especially countries that began to have records on I/B/E/S only recently. In order to reduce our data collection effort, we delete those countries for which I/B/E/S begins to provide forecasts after year 1995, which results in 47 countries and 31,415 stocks. As in Chui et al. (2010), we include only stocks traded on the primary stock exchanges in each country, which results in 31,188 stocks. Furthermore, we include only primary listings (i.e., requiring Primary = 'P' in Datastream and excluding those stocks with missing information on primary listing status), which results in 28,421 stocks.

Step 4: Retrieve monthly stock return from Datastream.

We match our refined sample of 28,421 stocks in step 2 with the forecast sample in step 1, which results in 2,196,359 stock-month observations. These observations are merged with the stock returns of the following month. We calculate monthly stock return using monthly return index (*RI* in Datastream) denominated in U.S. dollars. One issue with the return index in Datastream is that after a stock is delisted, the return indexes after delisting are copied for later periods, which results in a trailing of zero returns. Following Ince and Porter (2006), we delete all monthly return observations from the end of the sample period to the first nonzero return.[1] Only 1.5% of the above 2,196,359 firm-month observations have missing returns in the following month.

Step 5: Delete observations with missing variables and potential data errors.

We delete observations with missing forecast dispersion, which is defined as the ratio of the standard deviation of analysts' current fiscal-year annual earnings-per-share forecasts (i.e., forecasts of forthcoming earnings-per-share) to the absolute value of the mean forecast. This results in 1,628,098 stock-month observations. We then delete 368 observations with missing market capitalization (*MV* in Datastream). We also delete 1,350 observations whose earnings announcement date (*ANNDATS_ACT* in I/B/E/S) is prior to the fiscal year end (*FPEDATS* in I/B/E/S), 12,207 observations whose forecast statistic date (*STATPERS* in I/B/E/S) is later than the earnings announcement date, and 33,256 observations whose forecast statistic date is more than 12 months prior to the earnings announcement date. These observations are likely to be data errors. These criteria result in 1,580,917 stock-month observations. Next, we delete observations with holding period returns at the top and bottom 1% within each country, as many of these extreme returns are likely to be the result of coding error (McLean et al. 2009). We also delete observations with forecast error, calculated as the absolute value of the difference between monthly consensus forecast and actual

[1] Another method adopted in the literature to address this issue is to delete returns with non-positive trading volumes. We find that for some countries (e.g., Germany), Datastream begins to have records on trading volume later than it begins to have records on return index. This means that using the method of deleting returns with non-positive trading volumes will result in the deletion of many valid return observations. Hence, we do not use this method.

earnings-per-share scaled by the latter, at the top 99% within each country[2], because these forecasts are likely to be the results of data errors. This results in 1,533,909 stock-month observations.

Step 6: Select countries with sufficient observations.

For each month we limit our sample to countries with at least 100 observations. We also delete countries with a return history of fewer than 60 months over our sample period, which runs from February 1990 to December 2013. This results in 1,241,339 stock-month observations from 23 non-U.S. countries.

References

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[2] The lower bound of forecast error is 0.