Institutional Ownership and Future Stock Returns: An International Perspective

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ABSTRACT

We investigate the risk-adjusted performance of the aggregate equity holdings and trades of 13,807 active mutual funds located in 16 countries between 2001 and 2014. Using portfolio sorts, we find weak evidence that institutional holdings exhibit positive subsequent risk-adjusted returns. However, any outperformance is unlikely to stem from short-term informational advantage: stocks bought do not outperform stocks sold in the subsequent quarter. This finding is robust to regressions of subsequent stock returns on changes in institutional ownership and holds for different measurements of institutional trading.

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I. INTRODUCTION

Despite the success of the mutual fund industry in attracting investors, studies find mixed evidence on whether institutional ownership and trading predict future returns. For example, Nofsinger and Sias (1999) find a positive relation, while Cai and Zheng (2004) find a negative one. Among others, Barras et al. (2010) document a recent decreasing trend in mutual fund performance, indicating a potentially weakening correlation between institutional trading and subsequent stock returns. Most academic research focuses on domestic US funds which constitute the single largest market. However, most assets (56% in our sample) are managed by funds domiciled outside the USA. Moreover, only 33% of the funds are domiciled in the USA and the rest in less crowded countries (Khorana et al. 2005) where markets could offer more opportunities for managers to exploit informational advantages.
In this study, we revisit the question whether ownership of and trading by active equity mutual funds predict subsequent risk-adjusted returns. Our sample covers the worldwide equity holdings and trades of 13,807 active mutual funds between 2001 and 2014, domiciled in the USA, Canada, as well as funds located in typical offshore locations such as Luxembourg and Ireland, and funds domiciled in 12 other developed European countries. Using portfolio sorts, we find weak evidence that institutional ownership is positively correlated with future risk-adjusted returns. Aggregate institutional trading, however, is not. We complement the portfolio sorts using return-predictive regressions. Depending on the measure of changes in institutional ownership and specification, we find either no or even a negative relationship between institutional trading and subsequent returns.

This article also offers a methodological contribution for computing risk-adjusted returns of international stocks. For the portfolio sorts, we follow the risk-adjustment approach of Wermers (2003) and compare the performance of stocks with the return of a benchmark portfolio of stocks with similar size, book-to-market, and momentum characteristics. We develop a similar method for international markets and compute benchmark portfolios separately for developed and emerging market countries belonging to broad geographical regions.¹

II. METHODOLOGY

The relationship between institutional ownership and subsequent stock returns is typically studied via portfolio sorts or return-predictive regressions. In this study, we apply both methodologies. In the first approach, we follow Chen et al. (2000) and construct quarterly portfolios of all stocks held in our sample, weighted by the total dollar value owned by funds (“Total Holdings”).² We further examine the performance of the aggregate trades, which represent a stronger opinion than the passive decision to hold existing positions. To this end, we construct a portfolio of stocks with an aggregate increase in institutional ownership between two consecutive quarters, where we weight stocks using aggregate volume traded. We label this portfolio “Buys.” Similarly, we construct a “Sales” portfolio, consisting of stocks with an aggregate decrease in institutional ownership between two consecutive quarters, again weighted using aggregate volume traded. We rebalance the portfolios every quarter with the latest reported fund trading information. We track the performance of the portfolios during the formation quarter (Q0) and in the next cumulative one to four quarters (Q1 to Q1-4) in local currency.

¹ While computing the returns of benchmark portfolios, we overcome a number of challenges related to size of different markets, differences in legal origin, and data quality.
² Berk and van Binsbergen (2015) argue in favor of measuring fund performance in dollar terms. A portfolio approach takes dollar values into account by value-weighting individual stocks and testing in the time dimension.
In order to measure the performance of the portfolios, we require an adequate risk-adjustment. A common approach involves the comparison of individual stock returns with the returns of benchmark portfolios of stocks with comparable size, book-to-market, and momentum characteristics. However, this adjustment is usually not applied in studies utilizing international data because of the lack of readily available international benchmark portfolios. Instead of relying on noisy estimates from regression-based risk-adjustments, we generalize the approach of Wermers (2003) to international stocks.

Similar to Fama and French (2012) who examine stock market integration, we allocate stocks to different regions and then calculate benchmark portfolios for each region. Benchmark-adjusted portfolios are constructed for stocks from the developed regions of North America, Europe, Japan, and Asia-Pacific. We assign separate benchmark portfolios to stocks from the Emerging Market regions of Asia-Pacific, Europe, and Latin America. We provide an extensive overview of the benchmark portfolio construction process in Appendix S1 (Supporting Information).

We complement the portfolio sorts using return-predictive regressions. Specifically, we regress subsequent quarterly stock returns on institutional ownership and changes in institutional ownership, where we control for a number of stock characteristics. Since the residuals in panel regressions of returns on characteristics including lagged returns are not independent, we follow Gompers and Metrick (2001) and use Fama–MacBeth regressions and include country and Industry Classification Benchmark sector fixed effects.

III. DATA CONSTRUCTION

We obtain the portfolio holdings of funds in our sample from the fund database of Factset. As of the end of 2014, Factset provides the reported holdings of more than 90,000 funds, located in 89 markets and including defunct and alive, as well as active and passive mutual funds, pension funds, insurances, closed-end funds, and other funds. Factset acquires these holdings from publicly available sources or by directly querying management firms. We select only actively managed open-ended equity funds with at least 15 million USD and at least 50 stock holdings. We exclude funds domiciled in countries with scarce data.3 The detailed fund selection and data cleaning procedures are available in Appendix S1 (Supporting Information).

We proceed to match funds’ reported holdings with stock specific information from Worldscope and Datastream using CUSIP, ISIN, and SEDOL identifiers. We only select stocks from countries located in Europe, the Americas, Japan, and the Asia-Pacific region which are also members of the Standard & Poor’s BMI indices for developed and emerging markets.

3 A prominent domicile excluded is Australia as Factsets collects only the top 10 holding positions for Australian funds.
## Table 1  Summary statistics

| Country of domicile | Funds count | TNA mean | Holdings mean | Panel B: Stock characteristics |
|---------------------|-------------|----------|---------------|-------------------------------|
| All domiciles       | 13,807      | 718      | 154           | IO               | 3.770 | 6.934 | 0.000 | 86.204 |
| Austria             | 162         | 95       | 108           | ΔIO              | 0.068 | 1.597 | -66.097 | 45.049 |
| Belgium             | 272         | 129      | 147           | ΔNII             | 0.701 | 14.999 | -717.000 | 1351.000 |
| Canada              | 1177        | 327      | 125           | ΔBREADTH         | 0.010 | 0.199 | -11.161 | 16.936 |
| Switzerland         | 245         | 197      | 196           | PC_NII           | 0.080 | 1.222 | -1.000 | 269.500 |
| Germany             | 439         | 324      | 93            |                 |       |       |        |       |
| Denmark             | 159         | 141      | 138           | btm              | 0.281 | 0.995 | -1.666 | 2.070 |
| Spain               | 326         | 79       | 80            | Size             | 5.463 | 1.853 | 1.914 | 8.797 |
| Finland             | 100         | 162      | 83            | RET              | 0.035 | 0.190 | -0.324 | 0.463 |
| France              | 690         | 295      | 111           | TURN             | 0.085 | 0.113 | 0.001 | 0.424 |
| United Kingdom      | 1358        | 466      | 122           | VOL              | 0.391 | 0.213 | 0.130 | 0.950 |
| Ireland             | 750         | 312      | 188           | PRICE            | 17.343 | 22.058 | 0.175 | 81.643 |
| Luxembourg          | 3099        | 328      | 151           | MSCI             | 0.096 | 0.294 | 0.000 | 1.000 |
| Netherlands         | 133         | 627      | 120           | DY               | 1.774 | 1.946 | 0.000 | 6.840 |
| Norway              | 86          | 341      | 142           | ANALYSTS         | 5.178 | 6.719 | 0.000 | 22.000 |
| Sweden              | 242         | 386      | 167           | ILLIQ            | 0.254 | 0.734 | 0.000 | 4.425 |
| USA                 | 4569        | 1322     | 179           | MOM              | 0.117 | 0.387 | -0.527 | 1.044 |

**Notes:** We provide summary statistics of the sample. Panel A reports fund summary statistics including domicile, unique number of funds, mean total net assets (TNA, in million USD), and mean number of stocks held. Panel B displays the mean, standard deviation, minimum, and maximum of stock-level variables. IO is institutional ownership, defined as fraction of total shares outstanding owned by all funds in our sample and expressed in percentages; ΔIO is change in IO; ΔNII is change in the number of institutional investors holding a stock; ΔBREADTH standardizes ΔNII using the cross-sectional number of funds in our sample as divisor; PC_NII standardizes ΔNII using the lagged number of funds holding the stock as divisor; btm is log of industry-adjusted book-to-market ratio; size is log of primary issue market capitalization in million USD; RET is quarterly raw return; TURN is stock turnover, defined as monthly trading volume scaled by number of shares outstanding; VOL is the volatility of monthly returns during the last 12 months; PRICE is stock price in USD; MSCI is an indicator variable taking 1 if the stock is part of the MSCI World Index and 0 otherwise; DY is dividend yield in percent; ANALYSTS is the number of analysts following the stock in the IBES database; ILLIQ is Amihud’s illiquidity measure; and MOM is the 9-month return preceeding RET.
We present summary statistics in Table 1. The final sample spans the period 2001–2014 and covers the equity holdings and trades of 13,807 funds from Austria, Belgium, Canada, Switzerland, Germany, Denmark, Spain, Finland, France, UK, Ireland, Luxembourg, the Netherlands, Norway, Sweden, and the USA. In panel A, we report key fund characteristics, and in panel B we provide summary statistics of the stock-level variables used in this study.

IV. RESULTS

A. Portfolio sorts

Panel A of Table 2 documents the performance of the aggregate holdings of all funds in our sample. Consistent with US studies (e.g. Chen et al. 2000), we find that the aggregate holdings portfolio has a positive risk-adjusted performance of 1.28% during the portfolio construction quarter. Our main focus, however, is on the subsequent performance of the aggregate holdings. We find that the aggregate portfolio has a positive performance that continues in the next quarters; from 0.16% in the first quarter up to 0.26% in the three quarters following portfolio formation (significant at the 10% level). At first sight, the risk-adjusted performance of the aggregate holdings appears small in size. However, during our sample funds hold a large fraction of between 10% and 14% of the overall stock market. Thus, it is unlikely that funds as a group outperform the benchmark by a large amount. We further examine the difference in returns between decile portfolios of stocks with highest and lowest ownership. The spread in return is positive and increasing with the holding period, but statistically indistinguishable from zero.

Our focus is on funds which promise superior returns based on their active management of stocks. Hence, we analyze the performance of aggregate trades, which represent a stronger opinion than the passive decision to hold existing positions. Results are reported in panel B of Table 2. There is a strong, positive relation between contemporaneous returns and trades (i.e. Q0 returns). Using a sample of US funds, Sias et al. (2006) attribute this pattern to both a permanent price effect associated with informed trading and a temporary liquidity effect. We further find that funds’ purchases add value in the subsequent quarter. The outperformance amounts to a statistically significant (at the 10% level) 0.28%. However, the duration of return predictability appears to be short, since any statistical outperformance of the aggregate buys is limited to the quarter following trading.

Contrasting this, funds’ selling decisions appear to destroy value. The aggregate sales portfolio generates statistically significant (at the 10% level) 0.57% in the quarter following trading. Note that if funds can predict poor performance and trade upon that information, we would observe a subsequent negative performance. However, our findings indicate that funds sell stocks before they appreciate in value. The underperformance of the sales portfolio continues in the next three quarters, but is no longer statistically different from zero. The returns generated by the funds’ buying decisions are offset by the trading losses.
Table 2  Aggregate performance of stocks held and traded by mutual funds

Panel A: Aggregate holdings performance

|       | Q0       | Q1       | Q1-2      | Q1-3      | Q1-4      |
|-------|----------|----------|-----------|-----------|-----------|
| Buys  |          |          |           |           |           |
| Sales |          |          |           |           |           |
| Holdings | 1.28***  | 0.16*   | 0.22**   | 0.26*    | 0.30      |
|        | (0.13)   | (0.09)   | (0.11)    | (0.15)   | (0.20)    |
| Trades (Buys–Sales) |          |          |           |           |           |
|        |          |          |           |           |           |
| 1 (top) | 2.25***  | 0.33     | 0.48      | 0.55      | 0.73      |
|        | (0.25)   | (0.26)   | (0.33)    | (0.41)   | (0.54)    |
| 2      | 1.32***  | 0.16     | 0.06      | 0.20      | 0.14      |
|        | (0.21)   | (0.20)   | (0.28)    | (0.39)   | (0.52)    |
| 3      | 1.13***  | 0.11     | 0.42      | 0.64      | 0.80      |
|        | (0.19)   | (0.19)   | (0.30)    | (0.41)   | (0.54)    |
| 4      | 0.76***  | 0.04     | −0.21     | −0.25     | −0.26     |
|        | (0.17)   | (0.16)   | (0.26)    | (0.36)   | (0.48)    |
| 5      | 0.90***  | 0.19     | 0.36      | 0.33      | 0.23      |
|        | (0.25)   | (0.19)   | (0.29)    | (0.36)   | (0.41)    |
| 6      | 1.00***  | 0.32*    | 0.49*     | 0.54      | 0.67      |
|        | (0.17)   | (0.19)   | (0.30)    | (0.44)   | (0.64)    |
| 7      | 0.98***  | 0.18     | 0.45**    | 0.67*    | 0.85*     |
|        | (0.21)   | (0.18)   | (0.22)    | (0.35)   | (0.49)    |
| 8      | 0.89***  | 0.11     | 0.15      | 0.03      | 0.13      |
|        | (0.27)   | (0.21)   | (0.38)    | (0.49)   | (0.62)    |
| 9      | 1.16***  | 0.28     | 0.58      | 0.88      | 0.72      |
|        | (0.26)   | (0.26)   | (0.42)    | (0.66)   | (0.82)    |
| 10 (bottom) | 0.86*  | −0.07    | −0.30     | −0.72     | −1.08     |
|        | (0.48)   | (0.35)   | (0.55)    | (0.67)   | (0.86)    |

Panel B: Aggregate trading performance

|       | Q0       | Q1       | Q1-2      | Q1-3      | Q1-4      |
|-------|----------|----------|-----------|-----------|-----------|
| Buys  |          |          |           |           |           |
| Sales |          |          |           |           |           |
| Trades (Buys–Sales) |          |          |           |           |           |
|        |          |          |           |           |           |
| 1 (top) |          |          |           |           |           |
| 2      | 4.61***  | 0.11     | 0.25      | 0.22      | 0.39      |
|        | (0.51)   | (0.30)   | (0.47)    | (0.73)   | (0.89)    |
| 3      | 4.15***  | 0.50*    | 0.39      | 0.29      | 0.27      |
|        | (0.39)   | (0.26)   | (0.38)    | (0.37)   | (0.41)    |
| 4      | 3.59***  | 0.37     | 0.54*     | 0.41      | 0.62      |
|        | (0.43)   | (0.24)   | (0.33)    | (0.48)   | (0.59)    |
| 5      | 3.10***  | 0.47**   | 0.41      | 0.15      | 0.05      |
|        | (0.23)   | (0.22)   | (0.37)    | (0.31)   | (0.37)    |
| 6      | 2.33***  | −0.01    | −0.07     | 0.05      | 0.07      |
|        | (0.43)   | (0.28)   | (0.39)    | (0.49)   | (0.64)    |
| 7      | −0.90**  | −0.07    | −0.05     | −0.04     | 0.24      |
|        | (0.39)   | (0.26)   | (0.40)    | (0.44)   | (0.58)    |
| 8      | −2.13*** | 0.35     | 1.02**    | 1.10*     | 1.28*     |
|        | (0.31)   | (0.32)   | (0.51)    | (0.58)   | (0.66)    |
| 9      | −2.34*** | 0.80***  | 0.97*     | 1.12      | 1.60      |
|        | (0.25)   | (0.30)   | (0.59)    | (0.75)   | (1.01)    |
| 10 (bottom) | −3.41*** | 0.81     | 1.10      | 1.92      | 2.37      |
|        | (0.56)   | (0.54)   | (1.02)    | (1.52)   | (1.86)    |
Table 2 (continued)

| Panel A: Aggregate holdings performance | Panel B: Aggregate trading performance |
|----------------------------------------|---------------------------------------|
| Q0          | Q1      | Q1-2   | Q1-3   | Q1-4   | Q0         | Q1      | Q1-2   | Q1-3   | Q1-4   |
| 1–10        | 1.39**  | 0.40   | 0.78   | 1.27   | 1.81       | 8.02***  | -0.70  | -0.85  | -1.70  | -1.97  |
|             | (0.56)  | (0.53) | (0.78) | (0.95) | (1.22)     | (0.82)   | (0.44) | (0.87) | (1.18) | (1.50) |

Notes: At the end of each quarter, we compute the fraction of the market capitalization of each stock that is held by all funds in our sample (“fractional holdings”). Next, we sort stocks into 10 deciles based on that fraction (panel A) or changes in that fraction (panel B). In panel A, we compute the buy and hold benchmark-adjusted return in local currency for each portfolio as well as for the aggregate portfolio of holdings (“Total Holdings”) during the formation quarter (Q0) and the following cumulative 1, 2, 3, and 4 quarters (Q1, Q1-2, Q1-3, and Q1-4, respectively). Stocks in each portfolio are weighted using the aggregate value held by all funds in USD at the end of the formation quarter. We further track the risk-adjusted performance of a spread portfolio long in the top portfolio of fractional holdings and short in the bottom portfolio of fractional holdings (“1–10”). In panel B, we compute the benchmark-adjusted buy and hold return in local currency for each portfolio as well as for the aggregate portfolio of stocks with an increase in fractional holdings (“Buys”) and the aggregate portfolio of stocks with decreases in fractional holdings (“Sales”) during the formation quarter (Q0) and the following cumulative 1, 2, 3, and 4 quarters (Q1, Q1-2, Q1-3, and Q1-4, respectively). Stocks in each portfolio are weighted using the aggregate value traded by all funds in USD during the formation quarter. We further track the risk-adjusted performances in local currency of a spread portfolio long in the portfolio of Buys and short in the portfolio of Sales (“Trades”) and a spread portfolio long in the top portfolio of changes in fractional holdings and short in the bottom portfolio of changes in fractional holdings (“1–10”). We obtain time-series of portfolio returns and report means with Newey–West standard errors in parentheses.

*Significance on the 10% level. **Significance on the 5% level. ***Significance on the 1% level.
Table 3  Predictive regressions for raw returns using institutional ownership (IO)

|  | (1)       | (2)       | (3)       | (4)       | (5)       | (6)       |
|----|-----------|-----------|-----------|-----------|-----------|-----------|
| IO | 0.018     | (0.018)   |           |           |           |           |
| IO<sub>t-1</sub> | 0.018     | (0.016)   | 0.021     | (0.016)   | 0.021     | (0.016)   |
| ΔIO<sub>t</sub> | -0.106    | (0.069)   | -0.106    | (0.070)   |           |           |
| ΔNII<sub>t</sub> | -0.039**  | (0.019)   |           |           |           |           |
| ΔBREADTH<sub>t</sub> | -2.848**  | (1.389)   |           |           |           |           |
| PC_NII<sub>t</sub> |           |           |           |           | -0.418   | (0.444)   |
| btm | 0.006***  | (0.001)   | 0.006***  | (0.001)   | 0.006***  | (0.001)   |
| size | -0.007*** | (0.001)   | -0.007*** | (0.001)   | -0.007*** | (0.001)   |
| RET | -0.009    | (0.012)   | -0.009    | (0.012)   | -0.008    | (0.012)   |
| TURN | -0.038*** | (0.013)   | -0.038*** | (0.013)   | -0.038*** | (0.013)   |
| VOL | 0.006     | (0.015)   | 0.006     | (0.015)   | 0.005     | (0.015)   |
| PRICE | 0.041     | (0.063)   | 0.041     | (0.063)   | 0.043     | (0.063)   |
| MSCI | 0.005**   | (0.002)   | 0.005**   | (0.002)   | 0.005**   | (0.002)   |
| DY | 0.001*    | (0.001)   | 0.001*    | (0.001)   | 0.001*    | (0.001)   |
| ANALYSTS | 0.001*** | (0.000)   | 0.001***  | (0.000)   | 0.001***  | (0.000)   |
| ILLIQ | 0.079     | (0.243)   | 0.084     | (0.243)   | 0.080     | (0.243)   |
| MOM | 0.013     | (0.009)   | 0.013     | (0.009)   | 0.013     | (0.009)   |
| Observations | 793,981   | 793,981   | 793,981   | 793,981   | 793,981   | 793,981   |
| R² | 0.171     | 0.171     | 0.171     | 0.172     | 0.172     | 0.171     |

Notes: The dependent variable in each specification is stock return in local currency in quarter \( t + 1 \), in excess of the risk-free rate in local currency. Depending on the specification, we include IO in quarters \( t \) or \( t - 1 \), defined as fraction of total shares outstanding owned by all funds in our sample and expressed in percentages; changes in IO (ΔIO) in quarter \( t \); the change in the number of institutional investors holding a stock (ΔNII) in quarter \( t \) and scaled by 100; standardized ΔNII using the cross-sectional number of funds in our sample in quarter \( t \) as divisor (ΔBREADTH); and standardized ΔNII using the lagged number of funds holding the stock in quarter \( t \) as divisor (PC_NII) and scaled by 100. All specifications include country and industry fixed effects (Industry Classification Benchmark sector) and control variables defined in Table 1. All variables are winsorized at the 0.05% level and we divide the coefficient on PRICE by 1000. We estimate coefficients using Fama–Macbeth regressions and report Newey–West standard errors in parentheses. *Significance on the 10% level. **Significance on the 5% level. ***Significance on the 1% level.
on the sales, leading to a trading performance that is statistically not different from zero. A closer inspection of the funds’ top trading decisions reveals a similar pattern. A portfolio long in the funds’ top buys and short in funds’ top sales generates a negative trading return that is increasing with the holding period. However, we cannot reject the null hypothesis of no spread. The lack of trading gains suggests that the weak evidence of superior risk-adjusted returns of funds’ holdings is unlikely to stem from superior short-term information.

B. Return-predictive regressions

The results from regressing subsequent quarterly stock returns on institutional ownership (IO) and changes in IO are presented in Table 3. In specification (1), we find that the level of IO does not have a statistically positive predictive power for returns in the next quarter. Our results are statistically weaker than those of Ferreira et al. (2017), who find a stronger link between IO and subsequent returns. However, their sample includes all funds in Factset while we focus on the more active funds. For example, index funds which are not included in our sample are more likely to follow similar strategies and therefore exert more demand pressure on prices. In subsequent specifications, we decompose IO into lagged ownership and changes in ownership. Because ownership patterns are relatively stable over time, lagged ownership proxies for institutional demand while changes in ownership reflect information (Gompers and Metrick 2001). The coefficient on changes in institutional ownership (ΔIO) in specifications (2) and (3) is even negative, albeit not statistically different from zero. This finding corroborates the portfolio sorts results in Table 2, indicating that quarterly institutional trading is not driven by superior short-term informational advantage.

Sias et al. (2006) suggest that changes in the number of institutional investors (ΔNII) holding the stock represents information better than changes in ownership. Chen et al. (2002) and Guo and Qiu (2016) propose to standardize ΔNII with the total NII in a stock (ΔBREADTH), and the lagged NII in the stock (percentage change in NII, PC_NII), respectively. In specifications (4)–(6), we include each of the three alternative measurements of institutional trading. All three negatively predict subsequent returns and ΔNII and ΔBREADTH are even statistically significant at the 5% level. Appendix S1 (Supporting Information) includes a robustness test where we study benchmark-adjusted returns instead of raw stock returns. Results are consistent.

V. CONCLUSION

We employ a comprehensive recent sample of 13,807 active mutual funds located in 16 countries and revisit the relationship between institutional ownership and trading and subsequent risk-adjusted returns. There is a weak positive relationship between institutional ownership and future risk-adjusted returns. However, our results indicate that institutional trading does not predict positive

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future returns. In fact, some of the specifications even suggest a statistically negative relationship between institutional trading and future returns. Thus, aggregate trading by actively managed international mutual funds does not reflect short-term informational advantages.

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Institutional Ownership and Future Stock Returns

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1 Sample Selection and Robustness Tests.