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Evidence from the Italian Stock Market

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ABSTRACT
The paper provides an empirical characterisation of the value effect detected on the Italian Stock Market in the sample period 2000-2018 based on the value premium offered for the acquisition of a value stock. A bid on a value stock generates a large and statistically significant average return on the holding of the target in the deal window, as opposed to bids on growth stocks. Returns on stocks which are the target of a bid accounts for up to two thirds of the average return on the long side of the Fama and French (1993) HML portfolio. The other significant component of the average return of HML is due to the short selling of small growth stocks, which, as evidenced in previous literature, is often difficult to implement from a practical point of view.

KEYWORDS
Fama-French model; value effect; merger arbitrage. GEL: G11, G12

1. Introduction

The Fama and French three-factor model (FF model, Fama and French (1993), Fama and French (1996)) pivots on the role of two managed portfolios, containing small stocks long and big stocks short (SMB) and high book-to-market stocks long and low book-to-market stocks short (HML) respectively, in explaining both time series and average stock returns. The SMB and HML factors rationalise empirical returns anomalies which are not explained by the Capital Asset Pricing Model. The risk praemia earned by these two risk factors, are commonly referred to as the value effect and the size effect. Despite the empirical success of the FF model, its theoretical basis is still debated. Attempts to construct a theoretical justification have been made by Heaton and Lucas (1996), Zhang (2005) in the context of neoclassical general equilibrium models. The alternative view proposed by Shleifer and Vishny (1997) considers the value effect an example of mispricing and market inefficiency. Ali, Hwang and Trombley (2003), Doukas and Li (2009), Doukas et al. (2010) tie the persistence of high average returns on value stocks to their higher idiosyncratic risk which deters arbitrageurs from exploiting the anomaly.

Empirically, the average return on the HML and, at least until the 1990s, SMB, has

been considerable. The empirical literature has extensively examined the properties of SMB and especially HML returns, either in order to find alternative factors that provide a better fit, or to point out specific stylised facts at the basis of the value and size effects.[1] On the latter line, Loughran (1997) argues that a positive premium on HML is due to the poor performance of low book-to-market ("growth") stocks included in the HML portfolio, which would be near impossible to short in practice in order to earn the value premium, as well as to seasonality and tax deferral trading prior to December 31st of each year (a US specific feature). According to Loughran (1997) these findings possibly explain why value managers have a hard time beating the stock market index.

Similar empirical considerations on the importance of small growth stocks in explaining the value effect apply to the Italian stock market, where the official list contains a high number of really small stocks. In this paper I argue that, besides the effect of small growth stocks in determining the value premium, a significant component of the value effect arises from the fact that value stocks are the targets of profitable takeovers more than growth stocks. Takeover deals release the value embedded in high book-to-market stocks, and are a possible remedy when a company is not well managed. It has been documented that a high book-to-market ratio is positively associated with the probability of a takeover. Book-to-market is an explanatory variable of any model aimed at predicting likely targets, as in Palepu (1986), Brar et al. (2009), Martijn Cremers, Nair and Kose (2009), Lia and Zhou (2019). Notably Martijn Cremers, Nair and Kose (2009) propose a model for the prediction of takeover targets and establish that book-to-market is among the highly significant variables that identify *ex ante* such targets. Their takeover factor (defined as stocks more likely to be acquired long and stocks less likely to be acquired short) is closely correlated with HML and takes over its explanatory power to explain the cross sectional differences in return of a variety of sorted portfolios.

A high value premium can be computed for the Italian market in recent years, which is in contrast to the overall very poor performance of the stock market as a whole. The purpose of the present study is to provide indications on the determinants and viability of a value strategy in the Italian stock market. The analysis highlights the marked difference among average returns for shareholders of takeover targets as a function of book-to-market. This difference drives the long side of the HML portfolio, and provides a partial explanation for the value effect on the Italian stock market, the other significant component being the return on the shorting of small growth stocks in the (value weighted) HML low book-to-market portfolio. These facts may shed some light on the connection between the value premium and the takeover factor. A specific methodology has been devised to identify returns which are affected by takeover activity and are simultaneously part of the HML portfolio. The results are consistent with the idea that high book-to-market may anticipate a takeover, and that firms exposed to takeovers earn a higher rate of return as evidenced by Martijn Cremers, Nair and Kose (2009). The evidence is compatible with arbitrage risk explanation of the high average return on value stocks proposed by Ali, Hwang and Trombley (2003), Doukas and Li (2009), Doukas et al. (2010). However, if the value anomaly persists after a public offer is formally announced on a value stock, the arbitrage risk explanation could be phrased in terms of the probability that the

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[1]These include the momentum factor Carhart (1997), Novy-Marx (2013) asset profitability factor, Foye et al. (2013) cash flow factor to replace book-to-market.

deal fails, which depends on a number of qualitative and quantitative variables, like antitrust ruling, the shareholding composition, the likelihood that significant blocks are delivered to the offer, consistently with the literature on merger arbitrage e.g. Wang and Jia (2009), Cao et al. (2016).

Strategies that exploit the takeovers premium are commonly termed merger arbitrage position, and involve being long on the target stock which is being acquired and possibly, in paper deals, in which shares of the bidder are offered in exchange for shares of the target, being short on the acquiror (bidder) stock [2] which typically depreciates as a result of such trades. The literature has highlighted the high returns of such strategies, which have very little unconditional correlation with the stock market return Mitchell and Pulvino (2001), but some conditional correlation when the market goes down. Hence the paper analyses the extent to which the return on HML may be associated with deal returns. [3] To the extent that target companies' stocks enter the long (value) side of the HML portfolio and the return on these stocks is substantially higher than average stock market return, an extra return will be generated within the HML portfolio which contributes to the value effect. I find that such returns are indeed more pronounced when the targets are value stocks rather than growth stocks.

Merger arbitrage is correctly characterised by setting up post-announcement long positions on the target stock to earn the spread between the announced takeover price and the market price at the time of the announcement. However, the returns on guessing correctly the acquisition of a target stock before it is officially announced are typically much larger, and an increase in price of a target stock before the official announcement is a standard pattern in the market which is well known to traders and regulators. Pre-announcement cumulative abnormal returns are well documented in the academic literature. Since Asquith (1983) it is well known that abnormal returns on target stocks occur well before the deal is announced, and this pattern is common to stock markets all over the world, see for example Ma, Pagán and Chu (2009) for Asian markets, Borges and Garifo (2013) for European markets. A much debated question is whether the abnormal pre-announcement returns are due to insider trading Keown and Pinkerton (1981) Jarrel and Poulsen (1989) and the effective powers of stock market regulators to curb the phenomenon.

However, most pre-announcement abnormal returns occur in the few days before the deal is announced. As the HML portfolio is typically constructed using monthly returns, pre-announcement returns will be absorbed into the return of the month in which the announcement is made, although there may be cases in which the deal expectation is already in the marked months before the announcement. When monthly returns are used, within the month, it is not possible to distinguish between pre-announcement and post-announcement returns. The monthly return of a stock computed in the month in which a deal announcement occurs will include pre-announcement abnormal returns. These returns characterise the return on high

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[2]In fully hedged trades, long and short positions are in the proportion of the paper swap ratio according to which shares of the bidder are offered in exchange for shares of the target.

[3]Mitchell and Pulvino (2001) argue that merger arbitrage position taken on whatever deal is available on the market generate payoffs akin to the strategy of selling uncovered put options on the stock market. Active merger arbitrage managers indeed endeavour to avoid being in such a situation by screening the deals which are likely to be successful see Cao et al. (2016).The same conditional correlation, high when the market goes down and low when the market goes up, characterises HML, as pointed out by Lettau and Ludvigson (2001).

book-to-market stocks. If the pre-announcement anticipatory component of monthly stock returns affected by a deal is excluded, on using daily data to compute returns starting from the announcement of the offer, returns are generally lower. Nevertheless, a marked difference in return as a function of book-to-market of the target is still evident.

The paper is structured as follows: Section 2 describes the Italian market and the data used. A first assessment of the positive relationship between book-to-market and deal returns is presented by considering arbitrage spreads on the day of the announcement of an offer, as well as pre-announcement returns. Then the methodology is presented which has been used to extract monthly stock returns that are simultaneously included in the HML portfolio and are related to acquisition news, documenting the superior performance of value stocks relative to growth stocks which are the target of an acquisition. Section 3 deals with the impact of deal returns on the value premium in the Italian stock market. Section 4 introduces a merger arbitrage return index for value and growth stocks which excludes pre-announcement returns. It is shown that by computing the index for value and growth stocks a marked difference in return for high and low book-to-market stocks can still be detected. Section 5 concludes.

2.   Deal Returns of Value and Growth Stocks in the Italian stock market

Various authors have found a value effect in the Italian Stock market Aleati, Gottardo, Murgia (2000), Alesii (2006), Brighi and D'Addona (2008), Rossi (2012), Pirogova and Roma   (2020). The empirical investigation focuses on the contribution of deal returns to the value premium observed on the Italian stock market in the sample period 2000-2018. According to Pirogova and Roma (2020) the annualised value premium in those years was over 4%. The over-performance of value stocks over growth stocks was conjectured to be due to some extent to the higher frequency of large positive returns on value stocks compared to growth stocks. Such large returns are typical of stock market events like announced, or rumored, cash and paper bids on listed companies. In what follows I analyse the stock returns included in the high and low book-to-market portfolios that define the HML value factor in order to determine which returns included in HML can be attributed to a bid on a target stock.

The listed stocks sample for the calculation of the value premium is the same as the one used by Pirogova and Roma (2020) and includes stocks traded in the period between the end of June 2000 and the end of June 2018. The data source on returns is Thompson Reuters Datastream. Monthly stock returns are computed from adjusted month end prices. The number of stocks in the sample is 499, while the number of stocks listed and processed in each year is between 224 and 301. The HML factor is computed as in FF, using both equally weighted and value weighted returns. HML is the difference between the return of a value portfolio (containing small and big high book-to-market stocks) and a growth portfolio (containing small and big low book-to-market stocks), as defined at the end of June in each year. The number of stocks included in each year in the value and growth portfolios is between 67 and 90, and it comprises stocks falling within the 30% top and bottom percentiles of the book-to-market sorting. In addition, daily unadjusted prices and dividends paid from the same source were also used to compute the spread between the bid price and market price when an acquisition is formally announced, and the subsequent return on the position.

The data source on deals is Thompson Reuters. I consider deals announced in the sample period 2000-2018 in which the target was an Italian listed company, for a total of 1518 events. This database not only contains data on formal bid announcements but also includes documented news or company declarations on the possibility of a deal. Multiple entries occur for the same acquisition when the deal is first mentioned and subsequently formally announced, when the offer price is modified, and when a residual bid (or squeeze out) is launched following the acquisition of more than 90% or 95% of outstanding shares. When an acquisition is successful the final date on which it is effective is reported. Table 1 provides statistics on the volume of merger and acquisition deals in the Italian stock market in the period 2000-2018. The number and the value of the completed deals move in waves, as generally documented in the literature. Paper deals were also considered, however very few occurred in the sample period and, as discussed in the next section, they did not alter the results and were excluded.

A first analysis concerns merger arbitrage spreads. The potential gross return on a merger arbitrage position, ignoring transaction costs, is the spread between the bid price and the prevailing market price for the target. This is measured on the announcement date. Because formal bids are normally announced when the market is closed, the reference price for computing the spread is the price on the following day when the market is open. In the case of formal bids supplementary information on the terms of the offer was manually collected from the filing with the marked regulator, CONSOB, including the bid price and its modifications, as well as the final outcome. Since 2008 more detailed reporting by the bidder on the outcome of the bid has been prescribed. Calculation of the spread is a detailed exercise when there are contingent components of the bid price, like an earn-out linked to future events, which the market needs to evaluate. It was possible to reconstruct the spread for 372 bids launched in the 2000-2018 period, of which 70 on stocks that were included in the value portfolio at the time of the bid, and 67 on stocks that were in the growth portfolio at the time of the bid.

Table 2 reports the average spread for cash bids on the first day after a bid is officially announced (Panel (a)), the return on the target stock from the previous day (Panel (b)), as well as the return in the 20 working days preceding the announcement (Panel (c)). The Table shows also the average spread for target stocks which, at the end of the previous year, were in the upper and lower book-to-market 30% percentile. The spread in Panel (a) approximates the profit captured by an arbitrageur, which depends in reality on the intra-day price behaviour and volume. As documented in the previous literature, average pre-announcement profits reported in Panels (b) and (c), 9.4% and 12.9% respectively, are significantly larger than the average spread available right after the announcement reported in Panel (a) of 3.7%. When the entire sample is considered, spreads are always statistically greater than zero.

When the smaller samples of value and growth stocks are considered, it is apparent that both the spread on the day of the announcement and the return on the two pre-announcement periods are larger for value stocks compared to growth stocks. From Panel (a) the spread for value stock, 1.5%, is lower than the spread computed using the entire sample and is not statistically significant. However, the same spread for growth stocks is slightly negative, possibly due to the lack of precision in the estimation with a single data point for the day. More significantly, when the 1-day

and 20-day pre-announcement returns in Panels (b) and (c) are considered, the return on value stocks is significantly larger than the return on growth stocks, and is statistically different from zero for value stocks but not fo growth stocks. The 20-day average pre-announcement return on value stocks is 14.4% with a t-statistic of 4.7 and is significantly larger than the average pre-announcement return on growth stocks which is 3.3% with a t-statistic of 0.7. The 20-day pre-announcement return on value stocks is larger than the analogous return for the entire sample. These spreads affect the return of the value and growth portfolios in HML and are indicative that value stocks benefit more from bids than growth stocks. When the announcement of a formal bid is within a month, the month of the announcement will include a number of pre-announcement daily returns which will increase the monthly return.

2.1. *Methodology*

The contribution of returns on merger arbitrage deals to the value premium is gauged by determining the overlap between returns included in the HML portfolio and returns on merger arbitrage deals which occur in the deal window. The latter is defined to include a pre-announcement period, the deal announcement, and a post-announcement period until the date on which the deal is completed (effective date) at the end of the offer. The announcement date does not coincide with the official filing of the public offer with marked authorities (CONSOB in the present case), as news may already be in the market before, e.g. in the case of mandatory offers triggered by the acquisition of a 30% stake in the target.[4] For the purpose of the present analysis there is no need to study the entire deal since it suffices to use as the observation window the time when the target stock is included in a value portfolio or growth portfolio and contributes to the return on HML. Nevertheless, deal announcements are correctly indicated at the earliest time the information is available.

I filter the sub-sample of stocks issued by the target company which are included in the high book-to-market portfolio or in the low book-to-market portfolio in the relevant time window defined as starting n months before the deal announcement and ending (i) on the month of the announcement date (which is included), or (ii) on the month of the effective date, included. Case (ii) applies if the effective date is different from and greater than the month of the announcement date, which is the case of completed deals, while there will be no effective date for deals which did not complete. Increasing the number of months of the pre-announcement window slightly increases the number of deals to be considered, as well as the number of returns that are considered (by a maximum of n times the number of deals). Not all categories of stocks issued by the target company are the target of the acquisition, as for example in the case of partial tenders aimed at reinforcing control through the acquisition of common stocks only or in the buy back of a specific stock category. However, because Thompson Reuters provides only the (cusip) company code, all the company's stocks listed at the time of the bid were considered on the assumption of a high correlation between returns on stocks of the same company. [5] The Appendix details the methodology used in the selection of stock returns which are in the

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[4]Mulherin and Simsir (2015) analyse the differences in measured takeover performance when the announcement date is correctly specified and takes into account the time when the news is actually in the market.

[5]Individual stocks were associated with companies by way of ticker, and in some cases manually.

deal window and pertain to HML. In essence, a bid may be initiated when the target stock is part of HML, or may be initiated before the stock is part of the HML portfolio but completed when the target stock is in the HML portfolio, or it may be initiated when the target stock is no longer in the HML portfolio, but a pre-announcement period would extend back to when the stock was in HML. The methodology does not define ex ante strategies that may be implemented to earn a return premium, but rather it analyses ex post the source of component returns in HML.

Tables 3 and 4 report the results of applying this filter. The number of deal announcements involving target companies with value stocks included in HML was 240, of which 90 involved small value stocks and 150 involved big value stocks. Value stocks which are the target of a bid have an average book-to-market ratio of 1.38 for big stocks (average size 4.4 billion euros), and 2.06 for small stocks (average size 65 million euros). When growth stocks are considered, the number of deal announcements involving growth stocks included in HML as the target of an acquisition was 210, of which 109 were small growth and 101 big growth. Growth stocks which are the target of a bid have an average book-to-market ratio of 0.29 for big stocks (average size 10.3 billion euros), and 0.34 for small stocks (average size 93 million euros). By construction, the difference between the book-to-market ratio of value and growth stocks which are the target of a deal is substantial, and growth stocks have on average higher market capitalisation than value stocks.

It is also interesting to study the stocks which remain in the value portfolios for consecutive years. It turns out that value stocks which are subject to a deal are less likely to remain value stocks after the deal than are value stocks at large. The transition probability that a stock included in the high book-to-market portfolio remains in the high book-to-market portfolio in the following year or in two years is 0.66 and 0.55, respectively, for big value stocks, and 0.65 and 0.51 for small value stocks. If the same probabilities are computed for the subsample of value stocks which are the target of a deal, they become 0.43 and 0.31 if a deal is announced on the issuer of a big value stock and 0.59 and 0.38 if a deal is announced on the issuer of a small value stock. That is, the target tends to appreciate in value and book-to-market decreases in the following years, so that the stock exits the high book-to-market portfolio or is delisted.

2.2.   *Analysis of Deal Returns in HML*

Table 5 details the statistical properties of deal returns in HML. It is apparent that returns associated with announced deals where the target is a high book-to-market stock have a much larger positive mean, which is clearly statistically different from zero, while returns associated with deals announced on growth stocks have a mean which is not significantly different from zero. This is evident for deal windows including different pre-announcement periods $n = 0$ to $n = 3$. The *monthly* average return on high book-to-market stocks which are subject to a deal is between 2.61% and 1.85%, and it is about 5 times its standard error. On the other hand, the average monthly return on low book-to-market stocks which are subject to a deal is between 0.78% and 0.23%, and it is not significantly different from zero. Considering a pre-announcement window which includes one to three monthly returns prior to the announcement results in a slight decrease of the mean return. This is consistent with the evidence that pre-announcement abnormal returns occur in the few days

before the announcement, and are then absorbed in the monthly return around the announcement date. The difference in the mean return of value and growth stocks subject to a deal is statistically significant at the 1% level as evidenced by the t-test. The increase in the number of return observations that follows the increase in the pre-announcement period produces higher statistical significance as evidenced by the decrease in the P-values of the difference in mean return between value and growth stocks subject to a deal.

The difference in mean return evidenced in Table 5 is a characteristic of the return on target stocks with different book-to-market ratios. If the return on the entire deal, including monthly returns which are not in HML, are considered, Table 6 shows that the gap, although smaller, stil exists. Table 7 show that the gap also exists when only successfully completed deals are considered, and it narrows further when the entire deal return, and not just the portion in HML, is included in the computation of the mean return. Nevertheless, the mean return on value targets is double the return on growth targets. By comparing the results in Tables 5, 6, and 7, and 8, the inclusion of a stock which is the target of a deal in the HML portfolio on the basis of the book-to-market ratio in the previous year, independently of any analysis of whether the selected stocks are takeover candidates, forces the entry point in the merger arbitrage strategy in such a way that, on average, the gap between deal returns on value and growth stocks becomes wider.

The characteristics of deal returns included in HML are further analysed by looking at small and big value and growth stocks using different deal windows separately. The first panel of Table 9 shows that when returns on stocks in HML are considered starting from the month of the deal announcement to the month of the actual acquisition (when greater than the announcement month), the average return on small value stocks which are the target of a deal is between 3% and 2.54% on a *monthly* basis, while the same average for big value stock is between 2.5% and 1.88%. The average return on value stocks which are the target of a bid is in all cases between 3 and 4 times its standard error and it is therefore statistically different from zero. On the other hand, the average returns of small and large growth stocks in HML which are in the same deal announcement window are between 1.1% and 0.38% and between 0.58% and 0.13%, and are insignificantly different from zero. The positive difference in mean return of value stocks versus growth stocks is always statistically significant.

Overall there is evidence that high book-to-market stocks are a good deal and bidders are prepared to offer a substantial premium, while this is not the case for the expensive low book-to-market stocks. The potential of value stocks to provide significant return if they become the target of an acquisition is not matched by growth stocks. This asymmetry between returns on growth and value stocks which are the target of a deal contributes to the high mean return on HML. Moreover, extending the pre-announcement window to include previous months does not produce additional high returns.

The value premium in the Italian Stock Market in the sample period considered depends to a certain extent on the higher frequency of large returns on value stocks compared to growth stocks, as reported by (Pirogova and Roma 2020). The different frequencies of returns on value and growth stocks included in HML which are the

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target of a deal emerges clearly from Figure 1. The left hand side panel of Figure 1 shows that small value stocks which are the target of a deal display a frequency of monthly returns between 5% and 15% higher than the corresponding size growth stocks. The panel to the right of the Figure 1 shows that big value stocks which are the target of a deal display a frequency of monthly returns between 10% and 25% higher than the corresponding size growth stocks. This matches the difference between the return distribution on value and growth stocks in Pirogova and Roma (2020).

3.   The impact of deal returns on HML

In order to asses the impact of deal returns on the value premium, I re-computed the HML factor excluding all the returns of target value and growth stocks which are within the deal window. If deal returns are excluded from HML, Tables 10 and 11 show that the *monthly* mean return of HML decreases by about 5 bp, and the results are not much different if a smaller or larger pre-announcement window is considered. The monthly value premium of 0.266% on the value weighted HML factor decreases to 0.210%, and a slightly larger decrease from 0.408% to 0.338% occurs for the equally weighted HML factor. Hence, as shown in Tables 10 and 11 a fraction of about 25% to 30% of the value premium originates from takeover and merger activities. As shown in Table 9 only the returns originating from deals on high book-to-market stocks contribute to the positive value of HML. In other words, excluding deal returns from HML, whether equally or value weighted, does not eliminate the value effect as a positive value premium. It still exists, although in statistical terms we cannot reject the hypothesis that it is equal to zero. Only the value premium on the equally weighted HML factor is borderline significant, but no trace of statistical significance remains once returns associated with a deal window are removed.

When the stock of the target company is paid for by exchanging it for stocks of the bidder (a *paper deal*), the Merger Arbitrage strategy involves buying the target stock and shorting the bidder stock, which typically depreciates. One would expect that companies with expensive low book-to-market stocks would be likely to offer their paper in exchange for the target stock in an acquisition. The Thompson Reuter database reports 45 instances of paper deals in total on the Italian market between 2000 and 2018 where the bidder was an Italian stock exchange listed company. In no case at the time of the announcement was the bidder a high book-to market company. In contrast, in nearly half of the cases the bidder was part of the growth portfolio and was indeed exchanging its low book-to-market stock for that of the target. The returns on the bidder stock, which was likely to be shorted in the market at the time, were few and their mean insignificantly different from zero. Given the few returns for the bidders entering the growth part of HML this is not a significant component of the mean return of HML. In fact the value premium remained essentially unchanged once these returns were removed. In any case, ignoring these observations makes the result more conservative because the short leg of paper bids in principle further increases the value premium.

From Table 12 we see that in determining the value premium the action is in small stocks. When considering the equally weighted HML factor, panel (a) shows that on the long side small value stocks produce the bulk of the return, although big value stocks also have a positive mean return, which is half of that of small value stocks.

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On the short side, only small growth stocks contribute a positive mean return. Short selling big growth stocks is detrimental to the equally weighted value premium by 0.16% on a monthly basis. Once deal returns are removed, the average return on the long side of HML decreases by 0.1% while the return on the short side marginally increases by 0.024% in the case $n = 0$ and by 0.028% in the case $n = 1$, due to the fact that no counter-intuitive shorting of stocks which are the target of public bids occurs. Overall the value premium decreases from 0.408% to 0.033%.

The average return on the components of the value weighted HML factor are reported in panel (b). While the mean return on small value stocks is about 0.46%, big value stocks have a negative average return of 0.17%. The short selling of small growth stocks is again a very significant component adding back 0.3%, while a marginal decrease of 0.06% comes again from the shorting of big growth stocks. When deal returns are removed, the average return on the value side of the portfolio decreases from 0.14% to 0.095% in the case $n = 0$ and to 0.086% in the case $n = 1$. The return on the short side improves very marginally by less than 0.01%. Given the downward trend in the market throughout the sample period and recessive conditions in the economy it is apparent that small growth stocks were less resilient and generated an underperformance, which is exploited in the calculation of the value effect assuming that they are sold short.

Table 13 summarises the key findings by presenting the breakdown of the value premium into the average return on value and growth portfolios, as well as the value of the components once stock returns which occurs in the bid deal window are removed. The numbers are annualised for more immediate reading. The analysis is again carried out for the equally weighted and value weighted value factor, and for $n = 0$ and $n = 1$. From the Table it is evident that the value premium in the sample period is essentially due to (i) the return on the shorting of small growth stocks and to (ii) the large increment in the average return on the value side of the HML portfolio due to bids The first component is consistent with the evidence in Loughran (1997) mentioned in the Introduction Section. If this source of return were to be exploited in practice on the Italian stock market, the same arguments on the near impossibility to short very small stock would be perfectly to the point in the market examined here. As per Table 14 the average market capitalisation of these stocks is about 60 million euros. If the free float is considered, from Table 15 we are down to about 30 million euros. When short selling these stocks, if at all feasible, stock lending costs would have a non trivial impact. [6] The shorting of small growth stocks accounts for a large portion of the value premium, both equally weighted and value weighted. Shorting big growth stocks is actually detrimental to the value premium. Significantly, the average returns on the shorting of small growth stocks increases once deal returns are excluded from the computation of the value premium. The good news is that, as documented in the previous Section, there is not much return left in deals where the target is a growth stock. When considering equally weighted returns, the value premium falls from 4.9% to 3.8% when small growth stocks are removed, and further decreases to 2.7% and 2.6% when deal returns are removed. The impact of small growth stocks and deals is more striking in the case of the value weighted HML factor. The value premium decrease from 3.2% to less than 1% when the average return on small growth stocks is excluded. The deals component adds

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[6]Incidentally, for periods after the 2008 Lehman bankruptcy short selling was banned in the Italian stock market.

between 50 and 66 percent to the average return of the value side compared to the case in which deal returns are excluded from the value weighted HML. Hence when deal returns are also excluded the value premium becomes negative by a quarter of a percentage point.

In the present analysis stock selection is based on book-to-market, and not on ex ante selection of likely takeover candidates [Martijing Cremers]. However high book-to-market is associated with a higher likelihood of a public bid. Mechanically shorting small stocks that are targets of a public offer ("going Chinese" in the market terminology) is an implausible systematic strategy, with a very costly and unprofitable exit in case of short squeeze where the deal is successful, or no exit if in a paper deal target shares are fully converted into the bidder's.

The purchase of stocks which are the target of a bid in the value side of HML is a fundamental component of the value premium. Clearly, in order to implement a proper portfolio trading strategy the target should be chosen ex ante on the basis of an expectation of a takeover, if a pre-announcement strategy were to be followed, or upon the announcement in a post-announcement strategy. Nevertheless, the high book-to-market rule is effective in selecting profitable bids.
The portion of the return of HML which is driven by acquisitions of target stocks that are part of it may well explain the high correlation between HML and the Martijn Cremers, Nair and Kose (2009) takeover factor.

4. Merger Arbitrage return index

The anticipatory component which is present in monthly returns included in HML and computed across a deal announcement which occurs at some time during the same month prevents implementation of an ex ante trading strategy based on such returns (unless we can reliably predict targets or we hypothesise a strategy based on information leaks and possibly insider trading). A tradable strategy on M&A deals would begin on the announcement date and end on the effective date. An index of diversified merger arbitrage returns may be computed using daily data as proposed by Mitchell and Pulvino (2001) and Baker and Savasoglu (2002). Monthly returns for the tradable strategy are computed using daily data as:

$$R_j = \sum_{i=1}^{N_j} \frac{V_i \left[\prod_{t=m}^{M} (1 + R_{it}) - 1 \right]}{\sum_{i=1}^{N_j} V_i} \tag{1}$$

where j indicates the months in the sample period, N_j is the number of active deals in month j, $(1 + R_{it})$ is the dividend adjusted daily return on day t on stock i, m and M are the initial and final day, respectively, for the calculation of the return within the month, and V_i is the stock market capitalisation. The calculation starts on a date m within the month at least equal to the announcement date and ends on a date M which is not beyond the effective date. The weighting of deal returns according to the stock market capitalisation gives a plausible larger weight to big stock which may be more liquid, but setting $V_i = 1$ yields equally weighted returns.
The calculation of the return index for all the stocks subject to a deal in the sample

period 2000-2018 gives the result in Table 17. The sample predominantly contains completed deals, with very few instances of failed deals. On average over the sample period the yield from investing in all merger arbitrage deals at the announcement (on the first day when the market is open) and holding the position until the final date of the offer was 1.1% on a monthly basis, a result in line with result reported for other countries. If the strategy is restricted to positions where the target is part of the value or growth portfolio at the time of the announcement, the average return is again higher for value stocks and significantly lower for growth stocks. Because of the lower number of deals where the target is in the value or growth portfolio, for few months in the sample period no active deals are available. When the target is a value stock, from Panel (a) on average the monthly return was 1.64% over the sample period, with a t-statistic of 3.45, while in the case of growth stocks the average return is 0.5%, with a t-statistic of 0.92. If value weighted returns are considered, from Panel (b) the average returns are still considerably higher for targets which belong to the value portfolio, showing an average monthly return of 1.07% with a t-statistic of 2.06 against an average of 0.73% for growth stocks with a t-statistic of 1.18. This again highlights the marked difference between deal returns as a function of the target book-to-market ratio.

5.   Conclusions

The bulk of the value premium recorded on the Italian stock market in the period 2000-2018 stems from (i) returns on stocks which are the target of an acquisition held long in HML, and (ii) the shorting of small growth stocks, assuming no stock lending costs. Part (ii) of the strategy has been recognised in the literature surveyed in the Introduction section. However, it has also been evidenced that this strategy is difficult to implement. If we exclude both components (i) and (ii), the annualised value premium as routinely computed from the value weighted HML factor goes from 3.1% to -0.25%. A significant portion of the value effect derives from the fact that high book-to-market stocks are potential takeover candidates. Takeovers correct the under valuation in a substantial way, generating returns on high book-to-market target stocks which are significantly higher than returns on low book-to-market target stocks. Hence, among other things, high book-to-market identifies takeover candidates that earn a higher rate of return. A key result is the significant difference between the return on target stocks which happen to be value stocks compared to growth stocks. The return on the holding value stocks which are the target of an acquisition is on average 2.6% for big stocks and 3.8% for small stock on a *monthly basis*, and it is statistically significant. The return on the holding of growth stocks which are the target of an acquisition is instead insignificantly different from zero. The return premium generated by merger arbitrage activity on high book-to-market stocks included in the value portfolio does not entirely explain the value effect. However the presence of deal returns heavily influences the characteristics of HML. Once these returns are removed the HML return is statistically indistinguishable from zero. Different corporate events may explain the remaining part of the value premium. A company under-valuation may be corrected without a takeover bid in cases of turnaround associated with a new business plan or improved sector or market conditions. The evidence provided does not address the reasons for the general over-performance of value stocks compared to growth stocks. However, to the extent that the value premium is due to the extra returns generated by

merger arbitrage activity on value stocks, the same arguments and explanations that apply to abnormal merger arbitrage returns apply to the value premium. If we disregard the weakly feasible strategy of shorting small growth stocks, the extra return on the long side of HML resembles a well proven merger arbitrage strategy.

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Appendix

Firstly the stocks which are simultaneously in a value or growth portfolio (collectively HML portfolio) between July and June of the following year, and subject to a deal, are selected. There are three cases:

1) The target stock is in the value or growth portfolio at the time of the announcement;
2) The target stock is not in the value or growth portfolio at the time of the announcement but it is in the following period when the deal is still active;
3) The target stock is not in the value or growth portfolio at the time of the announcement but it is in the previous period if the effect of a pre-announcement period of length wn is considered.

If A is the announcement date and E is the effective date, BEGIN is the month of July of the year and END is the month of June of the following year and wn is a n-month pre-announcement window, the start month for the returns to be considered is selected as follows:

- If BEGIN≤A≤ END
  case 1: A-wn ≥ BEGIN ⟶ start extraction at A-wn
  case 2: A-wn < BEGIN the pre-announcement windows starts before the HML portfolio window. Then there are two possibilities:
  case 2.1: the stock was in the HML portfolio also in the previous year ⟶ start extraction at A-wn
  case 2.2: the stock was not in the HML portfolio in the previous year ⟶ start extraction at BEGIN

- If A<BEGIN and stock was not in the HML portfolio in the previous period
  case 1: E≥BEGIN ⟶ start extraction at BEGIN
  case 2: no E or E<BEGIN ⟶ do not extract

- A> END≥ A-wn and the stock is not in the HML portfolio in the next period; ⟶ start extraction at A-wn

The end month for the returns to be considered is selected as follows:

- A≤END and no E ⟶ stop extraction at A

- A≤E ≤ END and E not zero⟶ stop extraction at E

- A≤END ≤ E
  case 1: stock is in the HML portfolio in the next period ⟶ stop extraction at E
  case 2: stock is not in the HML portfolio in the next period ⟶ stop extraction at END

- A-wm ≤ END < A and the stock is not in the HML portfolio in the next period; ⟶ stop extraction at END

Table 1. Public bids on the Italian stock market in the period 2000-2018

Year	Number of announced deals	Number of completed deals	Completed deals value in million euro
1999	121	77	76661
2000	114	85	61323
2001	56	34	18438
2002	76	58	20245
2003	67	41	37421
2004	63	32	47555
2005	78	56	34905
2006	81	46	78006
2007	113	53	60359
2008	91	35	5079
2009	92	55	3958
2010	64	46	8853
2011	38	23	12766
2012	47	27	7820
2013	43	23	7301
2014	42	29	11625
2015	60	49	25166
2016	63	42	8542
2017	74	46	26486
2018	74	42	9978
2019	59	28	1761

The data source is Thompson Reuters. Through the deal screener function deals where the target is an Italian listed company were selected for the sample period. Announced deals include bids that were launched and were subsequently withdrawn as well as news on potential offers for the target. Completed deals only include successful acquisitions.

Figure 1. Frequency distribution of returns for Growth and Value stocks subject to a deal
In the Figure the dashed line, along the shaded area, represents the frequency distribution of returns on Growth stocks, the solid line the frequency distribution of returns on Value stocks. Sample period 2000-2018.
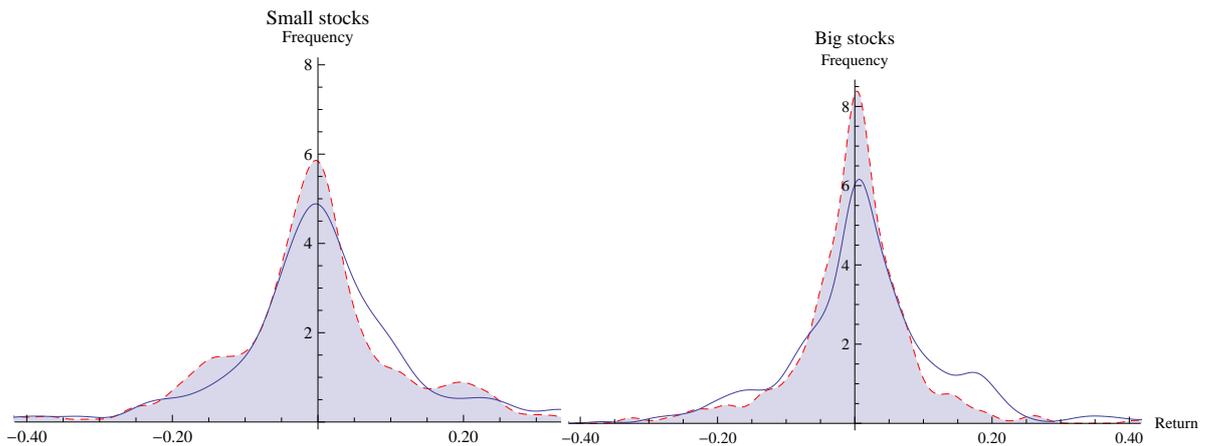
Table 2. Spread between bid price and market price

Panel (a): first trading day after the announcement	All deals	Value	Growth
No. Obs.	372	70	67
Mean spread	0.037	0.015	-0.026
Standard dev.	0.306	0.11	0.306
Standard error	0.016	0.013	0.037
t-stat	2.344*	1.121	-0.707

Panel (b): trading day previous to the announcement	All deals	Value	Growth
No. Obs.	372	70	67
Mean spread	0.094	0.08	-0.01
Standard dev.	0.348	0.184	0.329
Standard error	0.018	0.022	0.04
t-stat	5.203*	3.652*	-0.243

Panel (c): 20-day lagged price	All deals	Value	Growth
No. Obs.	372	70	67
Mean spread	0.129	0.144	0.033
Standard dev.	0.37	0.252	0.347
Standard error	0.019	0.03	0.042
t-stat	6.724*	4.789*	0.781

*Statistically significant at the 1% level.

The Table reports the average spread between the bid price and market price at the time of the announcement of an acquisition, for stocks which are classified as Value or Growth, in the sample period. Panel (a) reports the spread on the first trading day after the announcement. Panel (b) reports the spread with respect to the trading price on the last day before the announcement. Panel (c) reports the spread computed in the 20-day pre-announcement period. This is the average of the return from day $t-20$ to the day of the acquisition announcement, t. The t-stat is testing the hypothesis that the mean spread is equal to zero.

Table 3. Characteristics of value stocks in HML on which deals were announced

	Big Stocks		Small Stocks	
	Size	Book-to-market	Size	Book-to-market
Mean	4426.13	1.38	64.61	2.06
Standard Deviation	6901.65	0.74	70.47	1.37
Skewness	3.74	1.93	1.74	3.34
Kurtosis	18.90	4.65	2.83	12.95
Max	52205.85	4.55	309.74	8.33
Min	106.02	0.65	0.31	0.77

The Table reports the size and book-to-market characteristics of value stocks listed on the Italian Stock Market which were the target of a deal in the sample period 2000-2018. A 2-month pre-announcement window is considered for the inclusion of stock returns on the target in the value portfolio. The number of deal announcements on Big Stocks was 150, while the number of announcements on Small Stocks was 90.

Table 4. Characteristics of growth stocks in HML on which deals were announced

	Big Stocks		Small Stocks	
	Size	Book-to-market	Size	Book-to-market
Mean	10356.32	0.29	92.86	0.34
Standard Deviation	19740.67	0.10	80.55	0.14
Skewness	2.68	0.29	0.94	-0.18
Kurtosis	6.77	0.15	0.24	-0.65
Max	94526.47	0.62	348.71	0.59
Min	141.69	0.06	0.79	0.05

The Table reports the size and book-to-market characteristics of growth stocks listed on the Italian Stock Market which were the target of a deal in the sample period 2000-2018. A 2-month pre-announcement window is considered for the inclusion of stock returns on the target in the value portfolio. The number of deal announcements on Big Stocks was 101, while the number of announcements on Small Stocks was 109.

Table 5. Descriptive statistics of deal returns included in the value and growth portfolios in HML

	no pre-ann. window		1-month pre-ann. window	
	Value	Growth	Value	Growth
No. Obs.	630	516	820	688
Mean Return	0.0261	0.0078	0.0242	0.0057
Standard Deviation	0.135	0.1303	0.1356	0.1447
Standard Error of the Mean	0.0054	0.0057	0.0047	0.0055
Skewness	1.919	0.6	1.681	0.857
Kurtosis	10.86	8.283	9.399	9.55
Mean/Standard Error	4.861*	1.355	5.111*	1.038
Min	-0.4186	-0.6108	-0.4389	-0.6108
Max	0.9507	0.8255	0.9507	0.9091
t-test for equality of the Means	**2.32**		**2.56**	
P-value	**0.010**		**0.005**	

	2-month pre-ann. window		3-month pre-ann. window	
	Value	Growth	Value	Growth
No. Obs.	1004	854	1179	1018
Mean Return	0.0212	0.0038	0.0185	0.0023
Standard Deviation	0.1315	0.1303	0.1359	0.1307
Standard Error of the Mean	0.0042	0.0045	0.004	0.0041
Skewness	1.594	0.669	2.253	0.813
Kurtosis	9.009	8.259	16.678	8.53
Mean/Standard Error	5.096*	0.855	4.681*	0.552
Min	-0.4389	-0.6108	-0.4389	-0.6108
Max	0.9507	0.9091	1.444	0.9091
t-test for equality of the Means	**2.85**		**2.84**	
P-value	**0.002**		**0.002**	

*Statistically significant at the 1% level.

The Table reports the descriptive statistics of stock returns which are included in the value and growth portfolios that form the HML (high book-to-market minus low book-to-market) factor and are also in the deal window of an acquisition. The deal window is defined by including a pre-announcement window of a varying number of months. The characteristics of Value and Growth stocks are those described in Tables 3 and 4. The t-test is testing the hypothesis that the mean return on Value stocks is greater than the mean return on Growth stocks.

Table 6. Descriptive statistics of deal returns with Value and Growth stocks as target

	no pre-ann. window		1-month pre-ann. window	
	Value	Growth	Value	Growth
No. Obs.	716	647	918	864
Mean	0.0247	0.0107	0.0236	0.0077
Standard Deviation	0.131	0.1503	0.1319	0.1447
Standard error of the Mean	0.0049	0.0059	0.0044	0.0049
Skewness	1.906	1.919	1.673	1.911
Kurtosis	11.006	14.25	9.557	15.062
mean/Standard error	5.044*	1.809	5.423*	1.56
Min	-0.4186	-0.6108	-0.4389	-0.6108
Max	0.9507	1.2827	0.9507	1.2827
t-test for equality of the Means	**1.84**		**2.43**	
P-value	**0.032**		**0.008**	

	2-month pre-ann. window		3-month pre-ann. window	
	Value	Growth	Value	Growth
No. Obs.	1114	1054	1312	1246
Mean	0.0205	0.0053	0.0184	0.0032
Standard Deviation	0.1283	0.1397	0.1338	0.1381
Standard error of the Mean	0.0038	0.0043	0.0037	0.0039
Skewness	1.586	1.595	2.153	1.589
Kurtosis	9.122	13.258	16.148	12.95
mean/Standard error	5.32*	1.237	4.992*	0.814
Min	-0.4389	-0.6108	-0.4389	-0.6108
Max	0.9507	1.2827	1.444	1.2827
t-test for equality of the Means	**2.64**		**2.83**	
P-value	**0.004**		**0.002**	

*Statistically significant at the 1% level.

The Table reports the descriptive statistics of the return on Value and Growth stocks which are the target of an acquisition. Stock returns are not necessarily fully included included in the value and growth portfolios that form the HML but are included in the deal window of an acquisition. The deal window is defined by including a pre-announcement window of a varying number of months. The characteristics of Value and Growth stocks are those described in Tables 3 and 4. The t-test is testing the hypothesis that the mean return on Value stocks is greater than the mean return on Growth stocks.

Table 7. Descriptive statistics of completed deal returns included in the value and growth portfolios in HML

	no pre-ann. window		1-month pre-ann. window	
	Value	Growth	Value	Growth
No. Obs.	567	450	662	562
Average	0.0232	0.0084	0.018	0.0076
Standard deviation	0.132	0.1276	0.1265	0.1298
Standard error of the mean	0.0055	0.006	0.0049	0.0055
Skewness	2.177	0.795	1.532	1.097
Kurtosis	12.57	9.781	8.874	11.302
Mean/Standard error	4.192*	1.4	3.667*	1.385
Min	-0.4186	-0.6108	-0.4186	-0.6108
max	0.9507	0.8255	0.9507	0.9091
t-test for equality of the Means	**1.8**		**1.42**	
P-value	**0.036**		**0.078**	

	2-month pre-ann. window		3-month pre-ann. window	
	Value	Growth	Value	Growth
No. Obs.	816	673	929	780
Average	0.0209	0.0068	0.0124	0.0056
Standard deviation	0.1262	0.1345	0.1264	0.1313
Standard error of the mean	0.0044	0.0052	0.0041	0.0047
Skewness	1.467	0.874	1.473	0.599
Kurtosis	9.02	9.571	9.278	7.827
Mean/Standard error	4.735*	1.31	2.997*	1.186
Min	-0.4389	-0.6108	-0.4389	-0.6108
max	0.9507	0.9091	0.9507	0.8255
t-test for equality of the Means	**2.08**		**1.09**	
P-value	**0.019**		**0.14**	

*Statistically significant at the 1% level.

The Table reports the descriptive statistics of stock returns which are included in the value and growth portfolios that form the HML (high book-to-market minus low book-to-market) factor and are also in the deal window of an acquisition. The deal window is defined by including a pre-announcement window of a varying number of months. The characteristics of Value and Growth stocks are those described in Tables 3 and 4. The t-test is testing the hypothesis that the mean return on Value stocks is greater than the mean return on Growth stocks.

Table 8. Descriptive statistics of completed deal returns with Value and Growth stocks as target

| | no pre-ann. window | | 1-month pre-ann. window | |
	Value	Growth	Value	Growth
No. Obs.	653	581	790	732
Average	0.022	0.0103	0.0216	0.0111
Standard deviation	0.1278	0.1466	0.1247	0.141
Standard error of the mean	0.005	0.0061	0.0044	0.0052
Skewness	2.141	2.199	1.493	2.013
Kurtosis	12.626	16.234	9.521	17.085
Mean/Standard error	4.402*	1.687	4.868*	2.134
Min	-0.4186	-0.6108	-0.4389	-0.6108
max	0.9507	1.2827	0.9507	1.2827
t-test for equality of the Means	**1.5**		**1.54**	
P-value	**0.066**		**0.061**	
	2-month pre-ann. window		3-month pre-ann. window	
	Value	Growth	Value	Growth
No. Obs.	919	861	999	980
Average	0.0169	0.0078	0.0137	0.0073
Standard deviation	0.1238	0.1367	0.1279	0.1407
Standard error of the mean	0.0041	0.0047	0.004	0.0045
Skewness	1.559	1.595	1.404	1.746
Kurtosis	10.038	16.743	8.845	16.486
Mean/Standard error	4.129*	1.682	3.383*	1.614
Min	-0.4389	-0.6108	-0.4389	-0.6108
max	0.9507	1.2827	0.9507	1.2827
t-test for equality of the Means	**1.47**		**1.06**	
P-value	**0.07**		**0.14**	

*Statistically significant at the 1% level.

The Table reports the descriptive statistics of the return on Value and Growth stocks which are the target of an acquisition. Stock returns are not necessarily fully included in the value and growth portfolios that form the HML but are included in the deal window of an acquisition. The deal window is defined by including a pre-announcement window of a varying number of months. The characteristics of Value and Growth stocks are those described in Tables 3 and 4. The t-test is testing the hypothesis that the mean return on Value stocks is greater than the mean return on Growth stocks.

Table 9. Descriptive statistics of deal returns included in the value and growth portfolios in HML

	no pre-announcement window			
	Small Value	Small Growth	Big Value	Big Growth
No. Obs.	240	228	390	297
Mean	0.03	0.0116	0.025	0.0058
Standard Deviation	0.1543	0.1395	0.1232	0.1207
Standard error of the Mean	0.01	0.0092	0.0062	0.007
Skewness	1.81	0.08	1.887	1.186
Kurtosis	8.622	5.233	11.85	12.625
Mean/Standard Error	3.013*	1.254	4.012*	0.829
Min	-0.4141	-0.6108	-0.4186	-0.4921
Max	0.95	0.7317	0.9507	0.8255
t-test for equality of the Means	**1.42**		**1.92**	
P-value	**0.078**		**0.027**	
	3-month pre-announcement window			
	Small Value	Small Growth	Big Value	Big Growth
No. Obs.	322	317	498	385
Mean	0.0285	0.0088	0.0225	0.0036
Standard Deviation	0.1562	0.1425	0.1217	0.1169
Standard error of the Mean	0.0087	0.008	0.0055	0.006
Skewness	1.696	0.819	1.492	0.862
Kurtosis	7.482	8.023	10.134	11.656
Mean/Standard Error	3.268*	1.095	4.117*	0.606
Min	-0.4389	-0.6108	-0.4186	-0.4921
Max	0.95	0.9091	0.9507	0.8255
t-test for equality of the Means	**1.74**		**2.21**	
P-value	**0.041**		**0.013**	
	3-month pre-announcement window			
	Small Value	Small Growth	Big Value	Big Growth
No. Obs.	403	397	601	471
Mean	0.0253	0.0053	0.0192	0.0029
Standard Deviation	0.1475	0.1444	0.1207	0.1152
Standard error of the Mean	0.0073	0.0072	0.0049	0.0053
Skewness	1.698	0.626	1.355	0.693
Kurtosis	7.93	6.582	8.971	10.588
Mean/Standard Error	3.448*	0.736	3.895*	0.545
Min	-0.4389	-0.6108	-0.4186	-0.4921
Max	0.95	0.9091	0.9507	0.8255
t-test for equality of the Means	**2.01**		**2.14**	
P-value	**0.022**		**0.016**	
	3-month pre-announcement window			
	Small Value	Small Growth	Big Value	Big Growth
No. Obs.	482	475	697	557
Mean	0.0254	0.0038	0.0188	0.0013
Standard Deviation	0.1564	0.1467	0.1225	0.1137
Standard error of the Mean	0.0071	0.0067	0.0046	0.0048
Skewness	2.778	0.947	1.302	0.498
Kurtosis	18.582	7.233	8.338	9.689
Mean/Standard Error	3.569*	0.569	4.051*	0.263
Min	-0.4389	-0.6108	-0.4186	-0.4921
Max	1.444	0.9091	0.9507	0.8255
t-test for equality of the Means	**2.8**		**2.49**	
P-value	**0.026**		**0.006**	

*Statistically significant at the 1% level.

The Table reports the descriptive statistics of stock returns which are included in the value and growth portfolios that form the HML (high book-to-market minus low book-to-market) factor and are also in the deal window of an acquisition. The deal window is defined by including a pre-announcement window of a varying number of months. The characteristics of Value and Growth stocks are those described in Tables 3 and 4.

Table 10. Descriptive statistics of HML with and without deal returns

	no pre-announcement window		1-month pre-announcement window
	HML	HML - ex. deals	HML - ex. deals
N. Obs.	216	216	216
mean	0.00408	0.00338	0.0033
std	0.0317	0.0318	0.0319
skew	-2.41	-2.5719	-2.5271
kurt	19.39	20.975	20.865
min	-0.254	-0.26	-0.26
max	0.082	0.0779	0.0799
std error of the mean	0.0022	0.0022	0.0022
Mean/Std Error	1.9[+]	1.56	1.52

[+]Statistically significant at the 5% level, one sided test.

The Table reports the descriptive statistics of the HML (high book-to-market minus low book-to-market) factor, computed using equally weighted returns. HML - ex. deals indicates the HML return once returns which are in the deal window of an acquisition are excluded. Rm-Rf denotes the excess return over the risk free rate of the Mib market index.

Table 11. Descriptive statistics of HML value weighted with and without deal returns

	no pre-announcement window		1-month pre-announcement window
	HML VW	HML VW ex. deals	HML VW - ex. deals
N. Obs.	216	216	216
mean	0.00266	0.0021	0.00204
std	0.0342	0.034	0.0342
skew	-0.2674	-0.3289	-0.2907
kurt	1.238	0.986	0.882
min	-0.139	-0.138	-0.138
max	0.106	0.102	0.102
std error of the mean	0.0023	0.0023	0.0023
Mean/Std Error	1.15	0.91	0.88

The Table reports the descriptive statistics of the HML (high book-to-market minus low book-to-market) factor, computed using value weighted returns. HML - ex. deals indicates the HML return once returns which are in the deal window of an acquisition are excluded. Rm-Rf denotes the excess return over the risk free rate of the Mib market index.

Table 12. Breakdown of HML return into its components

Panel (a): equally weighted	Small Value	Big Value	Average return Value	Small Growth	Big Growth	Average return Growth
HML components	0.006263	0.003205	0.004734	-0.000302	0.001605	0.000652
HML components ex deals: n=0	0.005458	0.002119	0.003788	-0.00068	0.001502	0.000411
HML components ex deals: n=1	0.00534	0.002005	0.003672	-0.000775	0.001529	0.000377
Panel (b): value weighted	Small Value	Big Value	Average return Value	Small Growth	Big Growth	Average return Growth
HML-VW components	0.004583	-0.001703	0.00144	-0.003064	0.000617	-0.001223
HML-VW components ex deals: n=0	0.004035	-0.002135	0.00095	-0.003469	0.001163	-0.001153
HML -VW components ex deals: n=1	0.004015	-0.002285	0.000865	-0.00342	0.001071	-0.001174

The Table reports the descriptive statistics of the HML (high book-to-market minus low book-to-market) factor, computed using value weighted returns. HML - ex. deals indicates the HML return once returns which are in the deal window of an acquisition are excluded.

Table 13. Value premium excluding small growth stocks and deals

HML equally weighted	ex. small growth	ex. deals n=0	ex deals n=1
4.896	3.7548	2.7432	2.5716

HML value weighted	ex. small growth	ex. deals n=0	ex deals n=1
3.192	0.9876	-0.2556	-0.2472

Table 14. Average size of value and growth stocks

Year	Small Value	Big Value	Small Growth	Big growth
2001	69.344	1834.447	86.393	7452.213
2002	62.881	1861.175	102.138	6943.508
2003	54.323	1332.349	74.488	5403.636
2004	46.989	1003.951	66.812	6280.023
2005	64.020	1341.968	73.476	5258.733
2006	80.847	2000.506	96.317	7276.254
2007	91.045	2450.308	127.763	5362.246
2008	133.566	3684.345	157.850	3571.852
2009	71.616	1206.497	88.920	5612.983
2010	57.933	2365.944	49.167	2202.322
2011	47.982	1727.599	42.243	2435.164
2012	52.004	2547.325	51.170	2460.534
2013	33.370	1427.846	30.942	2430.573
2014	38.910	1898.663	42.869	2825.993
2015	71.063	4734.190	65.956	2327.416
2016	58.887	4501.162	78.142	3760.639
2017	50.060	2804.572	131.074	2925.957
2018	69.212	3721.197	75.849	4080.720

The table describes the average size for stocks which are part of the HML portfolio in the period June 2000 June 2018. Values in million Euro.

Table 15. Average free float of value and growth stocks

Year	Small Value	Big Value	Small Growth	Big growth
2001	29.874	864.833	34.293	2428.311
2002	27.241	1368.271	45.598	3813.238
2003	21.197	931.604	33.230	2684.137
2004	25.323	490.191	24.034	2996.529
2005	24.508	575.667	36.297	3010.527
2006	25.433	737.213	38.304	3831.230
2007	34.389	1016.167	53.166	3216.991
2008	53.517	2607.417	63.362	1929.477
2009	57.944	1166.610	54.432	3323.675
2010	24.927	1660.571	20.576	1108.813
2011	18.471	1602.751	13.374	1420.126
2012	26.760	2196.182	24.400	1057.980
2013	18.041	1186.907	12.489	1014.685
2014	14.134	1593.812	16.563	1358.204
2015	63.927	2612.602	31.492	1034.267
2016	29.879	2845.575	26.670	1506.497
2017	26.164	2829.987	75.894	1673.105
2018	32.983	2343.205	31.798	1824.255

The table describes the average value of free float for stocks which are part of the HML portfolio in the period June 2000 June 2018. Values in million Euro.

Table 16. Average book-to-market of value and growth stocks

Year	Small Value	Big Value	Small Growth	Big growth
2001	1.363	0.926	0.423	0.177
2002	1.168	1.021	0.315	0.188
2003	1.596	1.326	0.420	0.274
2004	1.944	1.591	0.498	0.343
2005	1.786	1.496	0.437	0.322
2006	1.524	1.067	0.371	0.304
2007	1.292	1.047	0.343	0.275
2008	1.123	0.858	0.303	0.251
2009	1.257	1.088	0.321	0.287
2010	2.779	2.228	0.567	0.451
2011	2.141	1.940	0.374	0.384
2012	2.266	2.250	0.425	0.387
2013	3.442	3.219	0.493	0.487
2014	3.409	2.945	0.480	0.389
2015	2.656	1.823	0.328	0.255
2016	1.971	1.540	0.298	0.261
2017	2.333	1.535	0.338	0.249
2018	2.772	1.835	0.374	0.259

The table describes the average value of the book-to-market ratio for stocks which are part of the HML portfolio in the period June 2000 June 2018.

Table 17. Average monthly return of diversified merger arbitrage positions

(a)	All deals	Value	Growth
Mean return	0.0117	0.0164	0.00581
Standart Dev.	0.0501	0.0690	0.0922
t-stat	3.45*	3.49*	0.93

(b)	All deals	Value	Growth
Mean return	0.0080	0.0107	0.00736
Standard Dev.	0.0511	0.0764	0.0917
t-stat	. 2.43*	2.06 *	1.18

*Statistically significant at the 1% level.

The table describes the average return on a diversified portfolio of merger arbitrage positions implemented in the 2000-2018 sample period. All deals refers to a portfolio which include every cash deal launced. Value and Growth refers to a strategy restricted to targets which at the time of the offer are part of the Value or Growth portfolio. Panel (a) reports the result for equally weighted average monthly returns, while panel (b) reports the result for value weighted monthly returns.