# ESSAYS ON TRUST AND ITS ECONOMIC CONSEQUENCES

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**Abstract**

The first essay examines how trust, a cultural and societal factor, can influence the profitability of momentum strategies in international stock markets. Using the trust measure developed by the World Values Survey and European Values Study for 65 markets over the period 1981–2019, I find that trust is positively associated with the magnitude of momentum profits. The trust effect on momentum is stronger in advanced economies; the positive relation is robust across size, after risk adjustment, controlling for firm characteristics and information environment, and using alternative trust measures. Empirical evidence supports the notion that trust increases stock market participation and adds disagreement in the market, which leads to momentum. Trust has stronger explanatory power than uncertainty avoidance on momentum profitability, and it includes unique information not in individualism.

In the second essay, I argue that distrust significantly increases people's perceived information asymmetry and has important economic consequences. Using the occurrence of financial restatements from 1995 to 2019 as a proxy for significant credibility reduction in financial information, I show that firms rely more on trade credit as an external financing choice after restatements because suppliers have an information advantage and address information asymmetry problems better. After comparing the predictability of sales by trade credit before and after restatements, I find that the informativeness of trade credit about firms' prospects changes during restatement periods. In the pre-restatement periods, firm sales monotonically increase with trade credit. In the post-restatement periods, firms with the most trade credit do not have the best future performance, while firms with the least trade credit experience the lowest subsequent sales. I also find that investors in the stock market do not realize such informativeness change and underreact to the valuable negative information from suppliers.

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# Essay 1. Trust and Momentum: International Evidence

## 1. Introduction

The efficient market hypothesis suggests that stock prices follow a random walk and that abnormal stock returns are eliminated because of arbitrage (Fama (1991)). However, Jegadeesh and Titman (1993) document that momentum investment strategies, buying past winner stocks and selling past loser stocks, generate approximately 1% monthly returns in the U.S. stock market. Internationally, Rouwenhorst (1998) demonstrates that the momentum effect exists in 12 European countries. Griffin, Ji, and Martin (2003) show that 29 of their 37 sample countries have significant momentum returns. Chui, Titman, and Wei (2010) confirm that momentum strategies are profitable in 41 markets worldwide and find that the individualism index developed by Hofstede (2001) is strongly related to the magnitude of momentum profits across markets.

A substantial body of literature has examined the potential reasons for momentum profits, both theoretically and empirically. Some behavioral models use investors' biased behaviors to explain the momentum phenomenon. Daniel, Hirshleifer, and Subrahmanyam (1998) suggest that the momentum effect is related to investor overconfidence and self-attribution bias. Barberis, Shleifer, and Vishny (1998) and Hong and Stein (1999) argue that conservatism and gradual information diffusion among investors can cause them to underreact to information and generate momentum, respectively. Grinblatt and Han (2005) and Frazzini (2006) demonstrate a link between the disposition effect and momentum. Da, Gurun, and Warachka (2014) find that investor inattention to continuous information induces a stronger momentum. Others have proposed risk-based explanations other than behavioral models. To name a few, Holden and Subrahmanyam (2002) connect the friction in information acquisition with the momentum phenomenon. Johnson (2002) uses firm growth rate risk to explain momentum returns. Chordia and Shivakumar (2002) indicate that macroeconomic factors and time-varying risk premia can

explain most momentum premiums. Sadka (2006) claims that liquidity risk can explain a substantial portion of momentum profits. Sagi and Seasholes (2007) find that firm-specific attributes such as a firm's revenue, costs, and growth options drive the cross-section of momentum. Asness, Moskowitz, and Pedersen (2013) provide evidence that strong covariation among asset classes experiencing momentum is consistent with a risk-based explanation.

These models were developed to explain the momentum effect in the U.S. market. However, momentum anomalies are pervasive in the international equity markets. The challenge is that, as suggested by Chui et al. (2010), risk-based explanations need to answer why momentum returns are risky in some but not all markets and behavioral pattern-based arguments have to explain why investors in some markets, but not others, are subject to psychological biases associated with momentum.

In this study, I adopt a behavioral approach to investigate whether trust can explain momentum anomalies across international equity markets. Trust, according to Guiso, Sapienza, and Zingales (2008), refers to the "subjective probability individuals attribute to the possibility of being cheated" (p. 2557). This subjective probability is partly based on the objective characteristics of the financial system, such as the quality of investor protection and its enforcement, but also reflects the subjective characteristics of the individual. Trust, as a cultural and societal factor, has significant economic effects. La Porta et al. (1997), Knack and Keefer (1997), and Zak and Knack (2001) find that trust can improve cooperation among market participants and facilitate economic efficiency. Guiso et al. (2004, 2008) show that trust can significantly influence stock market participation and financial market development. Using European data, Guiso et al. (2009) further confirm that trust increases international investment

and trade. Kondo, Li, and Papanikolaou (2021) develop a macroeconomic model to show that variation in the level of trust leads to higher innovation, investment, and productivity growth.

Trust can also significantly affect corporate events, such as financial transactions (Duarte, Siegel, and Young (2012)), mergers and acquisitions (Ahern, Daminelli, and Fracassi (2015)), earnings announcements (Pevzner, Xie, and Xin (2015)), corporate cash holdings (Dudley and Zhang (2016)), and dividends (Kelly (2019)). Gennaioli, Shleifer, and Vishny (2015) present a model to show that trust in the fund manager reduces an investor's perception of the riskiness of a given investment and allows managers to charge fees. Massa et al. (2020) use data from the global mutual fund industry and show that trust has an important effect on the activeness and effectiveness of delegated portfolio management. Guiso et al. (2003, 2004) demonstrate that differences in educational and religious backgrounds can create considerable differences in trust levels across individuals, regions, and countries. This study examines whether different levels of trust can explain the profitability of momentum strategies in different markets.

Guiso et al. (2008) find that trusting individuals are more likely to buy stocks and buy more stocks conditional on buying stock. They argue that investors factor in the risk of being cheated when deciding whether to buy stocks. More trusting individuals have a higher participation rate in the stock market because they have a lower perceived probability of being cheated. This argument applies not only to a country but also across different countries. Consistent with the findings of Guiso et al. (2004, 2008) and Pevzner et al. (2015), investors with less market knowledge and education rely more on trust in making economic decisions. For this type of naive investors, trust can improve their perceived familiarity with the stock market, reduce their anxiety, and encourage them to trade. Hence, trust-induced trade is more likely to originate from them. Because naive investors have less accurate priors and different economic

models to interpret information (Kandel and Pearson (1995); Ahmed, Schneible, and Stevens (2003)), the increase in the proportion of naive investors, relative to sophisticated investors, can increase the differential interpretation in stock information. Therefore, trust is positively related to investor disagreement.

The heterogeneity of investors' beliefs can cause further drifts in prices and return continuation. Allen, Morris, and Shin (2006) show that the aggregation of heterogeneous beliefs causes a failure in the law of iterated expectations and results in a drift in prices theoretically. Banerjee, Kaniel, and Kremer (2009) examine the mechanism of how slow aggregation can lead to a price drift and prove that it is important to assume that investors have differences of opinions about these beliefs. Hong and Stein (2007) argue that even if investors receive information simultaneously and pay equal attention, they may still disagree with the news because of their heterogeneous priors. They predict that the profitability of momentum is associated with disagreement levels among investors. Empirical evidence from Zhang (2006) and Verardo (2009) supports this proposition and suggests that greater disagreement is associated with stronger momentum in the U.S. market. In addition, Ottaviani and Sørensen (2015) demonstrate in their model that underreaction is more pronounced when prior beliefs are more heterogeneous. Cen, Wei, and Yang (2017) investigate how the interaction between disagreement and underreaction affects asset prices.

This study provides further support for this notion based on international data. The sample contains about 75,000 firms from 65 markets spanning 1981 to 2019, which is the most comprehensive sample in similar research to the best of my knowledge. Following prior literature, I use World Values Survey (WVS) and European Values Survey (EVS) data to

measure the level of trust in different markets. I examine the profitability of the momentum strategy in international stock markets and investigate its relationship with the trust level.

My main findings are as follows: First, I show that momentum returns are significantly higher in more trusted markets. The zero-cost market-neutral momentum portfolios in markets with the top 20% trust index outperform those in markets with the bottom 20% trust index by 0.785% per month, with a *t*-statistic of 5.39, which is significant at the 1% level. This effect still holds after controlling for firm size and risk adjustment using Fama and French's (1993) three-factor model in international markets. My finding is also robust after I exclude the financial crisis period during which momentum strategies have experienced the worst crashes (Barroso and Santa-Clara (2015); Daniel and Moskowitz (2016)).

My second finding shows that the high-minus-low trust portfolio has no long-term return reversal features for the three years following the formation of trust-sorted momentum portfolios. I find that, although the momentum profits in more trusted markets reverse after one year, they are still significantly higher than those in less trusted markets. This is in sharp contrast to individualism-sorted momentum portfolios, which exhibit long-term reversals, as in Chui et al. (2010).

Third, I consider several other potential factors that could affect momentum profits across countries. They include firm- and market-level variables that capture information uncertainty, financial market development and integrity, and institutional quality. I find that, although some of them are significantly associated with momentum returns, they do not materially affect the explanatory power of the trust measure on momentum profits.

Fourth, I examine whether my trust-based explanation is still robust when I control for other cultural variables, such as Hofstede's uncertainty avoidance and individualism indices. Chui et al. (2010) find that the individualism index is strongly positively related to the magnitude of momentum profits across markets. Dou, Truong, and Veeraraghavan (2016) show that the level of uncertainty avoidance is negatively associated and the level of individualism is positively associated with earnings momentum profits in international markets. My dependent sorting indicates that the trust effect on momentum still holds even after controlling for uncertainty avoidance and individualism. To distinguish between the effects of trust and individualism on momentum, I conducted spanning tests. My results suggest that trust and individualism represent different cultural dimensions and can expand the investment opportunity set when combined.

Based on trust and individualism indices, I created a new variable, MIX, from the product of these two cultural variables. This new variable has superior performance over individualism and trust in explaining momentum returns, suggesting that it includes different types of information, and trust is not a proxy for individualism.

This study makes two contributions to the literature. First, I propose that trust, a cultural and societal factor, provides an alternative explanation for momentum anomalies in international stock markets. A large body of literature uses U.S. stock market returns to examine momentum explanations. Using more comprehensive data from 65 markets, I find that investors do not exhibit fully rational behavior and underreact to stock information because of increased disagreement and heterogeneous beliefs in more trusted markets. My findings show that economic activities such as investor trading are affected not only by the overall financial environment and institutions (Stulz and Williamson (2003); Chan, Covrig, and Ng (2005);

Lesmond (2005); Eleswarapu and Venkataraman (2006); La Porta et al. (2006)) but also by culture (Guiso et al. (2006)), in particular, trust.

Second, I find that trust, as the subjective probability individuals attribute to the possibility of being cheated, plays an important role when investors are unfamiliar with the stock market or lack data to assess it. It includes unique information that does not exist in other cultural variables, such as uncertainty avoidance and individualism indices. Both the uncertainty avoidance and individualism indices are associated with momentum profits in international markets. However, a measure based on both trust and individualism can generate significantly higher momentum profits in international markets.

The remainder of this paper is organized as follows. In Section 2, I discuss the association between trust, disagreement, and momentum. Section 3 describes the sample data and explores the link between trust and trading volume as well as stock volatility. In Section 4, I report momentum profitability in international stock markets and examine the relationship between trust and momentum profits. Section 5 investigates the information included in trust, uncertainty avoidance, and individualism and constructs a composite measure to explain momentum profits across markets. Section 6 concludes.

## 2. Trust, Investor Disagreement, and Momentum

In this study, I follow Guiso et al. (2008) and define trust as the subjective probability that individuals attribute to the possibility of being cheated. The low perceived probability of being cheated by trusting individuals can significantly increase their cooperative behavior in the

economy.[1] By contrast, distrust can reduce the expected return from investment because investors have a higher perceived probability that the contract will not be respected by their counterpart (Georgarakos and Pasini (2011)). Guiso et al. (2008) find that trust encourages stock market participation and argue that the trust effect is consistent with the explanation that familiarity breeds stock market investment. In other words, trust improves individual investors' perceived familiarity with the stock market and increases their participation, even when they do not have sufficient knowledge.

Guiso et al. (2004, 2008) and Pevzner et al. (2015) find that less-educated individuals rely more on trust in making economic decisions. Individuals lacking knowledge and education are likely to be naive investors when they participate in the stock market. Therefore, trust-induced traders are likely to be naive investors, and trust can increase the ratio of naive investors to sophisticated investors in the stock market.

More participation in the stock market brings in investors having different priors. Bayesian investors update their beliefs when they receive new information. Hong and Stein (2007) indicate that investors with heterogeneous priors can interpret a piece of information differently even when they access similar information sets. Harris and Raviv (1993) and Kandel and Pearson (1995) argue that investors have different economic functions when interpreting and understanding information. Naive investors have less accurate priors and a lower ability to interpret information. Therefore, the increased proportion of naive investors related to trust can add disagreement in the market.

[1] It is noteworthy that trust and risk aversion are different, although both are determined by environmental factors. Ahern, Duchin, and Shumway (2014) provide causal evidence of positive peer effects on risk aversion and no effects on trust, which shows that trust and risk aversion are governed by distinct cognitive processes.

Allen, Morris, and Shin (2006) and Banerjee, Kaniel, and Kremer (2009) show that the slow aggregation of heterogeneous beliefs causes prices to drift slowly toward the fundamental value theoretically. Hong and Stein (2007) propose a class of "disagreement" models that suggest that the magnitude of the momentum effect is associated with the heterogeneity of beliefs via three mechanisms: gradual information flow, limited attention, and heterogeneous priors. Empirical evidence also supports the notion that greater disagreement among investors is related to stronger momentum (Zhang (2006); Verardo (2009)). Therefore, trust is likely associated with momentum by adding disagreement in the market.

Trust may also lead to investor overreaction. By its nature, trust can increase investors' perceived credibility of information from others and therefore elicit stronger reactions to that information. This is consistent with Pevzner et al.'s (2015) finding that there are stronger investor reactions in more trusted markets when earnings news arrives. The overreaction of investors can lead to excess trading volume and cause momentum in the medium term but reversals in the long run. However, excess stock market volatility may not be linked to trading volume in disagreement models. As Hong and Stein (2007) suggest, when (less-than-fully rational) investors interpret information differently (making different mistakes), these mistakes can balance out in terms of their effects on stock prices, but still cause large trading volumes.

In summary, my survey of the trust literature suggests that trust can encourage naive traders to participate in the stock market and hence increase the proportion of naive investors to sophisticated investors. Motivated by Ahmed et al. (2003), who argue that an increase in the proportion of naive traders can add disagreement to the stock market, and Hong and Stein (2007), who indicate that disagreement among investors is related to momentum profits, I examine whether the momentum effect is stronger in more trusted markets than in less trusted

markets. Additionally, I examine whether excess trading volume, stock market volatility, and long-term return reversals are more pronounced in trusted markets.

## 3. Data

The trust index comes from comprehensive cross-country surveys conducted by the EVS and WVS from 1981 to 2021 in more than 100 countries/territories and all major cultural zones by a worldwide network of social scientists. EVS has been responsible for planning and conducting surveys in European countries, while WVS does surveys in countries outside Europe and several European countries. The surveys were conducted every nine years by EVS, and every five years by WVS, except for Wave 1. The most recent wave took place in 2017-2021 and was jointly conducted by WVS and EVS. Currently, the WVS/EVS data include almost 400,000 respondents worldwide. The surveys reflect people's values and beliefs, how they change over time, and their social and political impact on almost 90 percent of the global population. The survey question related to trust asked, "generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?". To this question, 1 is assigned if a survey participant reports positively to this question and 0 otherwise. I use the average value of all responses in the survey year (reported in the WVS/EVS) as the trust index for a country or region. For the years without survey data, the nearest available average trust score is used. Therefore, I have not only cross-country variations but also the time series variations of the trust index.[2] A higher trust index indicates a higher level of trust in the market.

I obtain the stock return, market capitalization, and trading volume data from CRSP for the U.S. stock market and use DataStream data for all other markets.[3] The data are available after

[2] My conclusions still hold if the mean or median of trust survey data is used for the sample period in a country.
[3] I collect stock data from both the "Research" list and the "Dead" list provided by DataStream to mitigate the survival bias in the sample.

the 1980s for most international markets in DataStream and from 1926 for the U.S. market. The sample period ends in December 2019. The starting dates vary because of the different data availability for each market on DataStream. Following Chui et al. (2010), Ince and Porter (2006), and Griffin, Kelly, and Nardari (2010), I only include common stocks from the major stock exchange(s) in each market and exclude foreign listings.[4] Cross-listed stocks are included only in their home country sample.

The quality of the data from DataStream is not comparable to that from CRSP. To mitigate data quality concerns, I winsorize stock returns at the 1st and 99th percentiles.[5] I also assign the returns that reverse severely in the short term as missing, per Ince and Porter (2006). In addition, I set the monthly return above 1000% as missing. For my empirical tests, I require a country to have at least 30 stocks in any month to ensure a reasonable number of stocks. Following Chui et al. (2010), I require a country to have a minimum 5-year return history in the sample. To the best of my knowledge, my sample of 65 markets with about 75,000 individual stocks is the largest in the momentum literature.

[Insert Table 1.1]

Table 1.1 reports the trust scores for all markets included in the sample. Market capitalization and the number of stocks are also reported for each market at the end of the sample

[4] I also use a text searching programming followed by a careful manual examination to exclude preferred stocks, trusts, warrants, rights, real estate investment trusts, closed-end funds, exchange-traded funds, and global and American depositary receipts to make sure all the stocks in the sample are common stocks as defined by CRSP.
[5] I also use a different screening approach suggested by Hong, Lee, and Swaminathan (2003) that excludes stocks whose market capitalizations are lower than the 5th percentile in each market every month, and sets the returns below the 1st percentile and above the 99th percentile of all stocks in each market every month as missing. My results are robust to this different screening process.

period. The last three columns present the returns of winners, losers, and momentum portfolios in each market.

The WVS/EVS trust index allows cross-market comparisons of trust attitudes. Figure 1.1 shows the percentage of survey participants reporting "most people can be trusted" in the ten largest markets in terms of their market capitalization. I observe substantial differences in trust levels among countries. Although there are time variations in their trust indices, some markets consistently have higher trust levels than others. For instance, the U.S.'s level of trust is higher than that of France, and this relationship holds over the four decades from 1981 to 2021. Table 1.1 shows that, on one extreme, more than 60% of the survey respondents in countries such as Denmark, Finland, Norway, and Sweden trust others. On the other hand, countries such as Brazil, Colombia, Peru, and the Philippines have less than 10% of the survey respondents who believe it is true. It is worth noting that there is heterogeneity in trust among countries in the same region. For example, there is a six-fold difference between the Philippines (5.58%) and neighboring Indonesia (33.12%).[6]

[Insert Figure 1.1]

The last three columns report the returns on the winner, loser, and momentum portfolios for each market. Equally weighted winner and loser portfolios are formed based on past six-month stock returns in each market. I form momentum portfolios by buying the winner stocks and selling the loser stocks and then holding the portfolios for six months. For each market, stocks with performance in the top 20% in the formation period are assigned to the winner portfolio and those in the bottom 20% are assigned to the loser portfolio. I skip one month

[6] I have a similar finding in developed countries, such as Portugal (16.99%) vs. Spain (31.83%) and France (23.82%) vs. Germany (38.02%).

between the formation and holding periods to mitigate the biases induced by market microstructure. Following Jegadeesh and Titman (1993), I construct overlapping momentum portfolios to increase the test power. Among the 65 markets, 50 have positive momentum returns (17 markets have monthly returns larger than 1%), and 27 of them are significantly larger than zero at the 5% level. Norway (1.460%), the Netherlands (1.405%), and the United Kingdom (1.365%) have the highest average monthly momentum returns. This evidence is consistent with the literature that the momentum effect is prevalent in international markets.[7]

To determine the extent to which trust can affect investor behavior in the stock market, I first examine the relationship between trust and stock market trading volume. Hong and Stein (2007) suggest that a higher proportion of unsophisticated investors can increase the differential interpretations of information, and the elevated investor disagreement can further increase stock trading. Using analyst forecast dispersion as the proxy for disagreement, I find that its correlation with my trust measure across markets is 0.1534, which is significantly positive at the 1% level. Therefore, there is stronger disagreement in high-trust countries. Following Griffin, Nardari, and Stulz (2007) and Chui et al. (2010), I measure a market's trading volume using the dollar trading volume adjusted by its market capitalization.

I use a regression model similar to that of Chui et al. (2010). Specifically, I control for insider trading (Insider), political risk (Political), the ratio of total private credit to GDP (Credit) for financial market development, exchange rate volatility (Fxvol) for monetary policy risk, and the natural logarithm of monthly average stock volatility (LnV) in the regression. As in Petersen

[7] Untabulated results show that the average monthly returns on the market-neutral and pooled-market momentum portfolios in my sample are 0.520% and 0.552%, respectively. Both are significant at the 1% level.

(2009), I cluster the standard errors by market and month to calculate the *t*-statistics for each coefficient estimation.

[Insert Table 1.2]

Panel A of Table 1.2 reports the regression results. The coefficients of Credit, Insider, Fxvol, and LnV are all positive. Among them, the coefficients of Credit and Fxvol are significant at the 5% level, which suggests that a financial market with greater access to liquidity and larger uncertainty of monetary policies has more trading volume. After including these control variables, the estimated coefficient of trust is significantly positive at the 1% level, with a *t*-statistic of 2.68.[8] Therefore, my evidence suggests that more trusted markets have higher trading volume.

In a cross-market study, Chui et al. (2010) document that stock market volatility is positively related to the individualism index in a market. In Panel B of Table 1.2, I further study the relationship between trust and stock market volatility. I regress the natural logarithm of monthly average stock volatility on the trust index (Trust), the ratio of total private credit to GDP (Credit), the ratio of market capitalization to GDP (MCap), insider trading (Insider), the volatility of exchange rates (Fxvol), political risk (Political), the GDP growth rate (GDP), and financial market openness (Open).

The results in Panel B indicate that the signs of the coefficients on control variables, such as financial market development (Credit), GDP growth rate (GDP), and financial market openness (Open), are consistent with previous literature (Du and Wei (2005); Bekaert, Geert, and

[8] The univariate regression shows that the estimated coefficient on trust is 2.531, with a *t*-statistic of 4.69. As a robustness check, I also add Hofstede's individualism index in the regression. The coefficient of trust becomes 1.068 (*t*-statistic=1.99), significant at the 5% level. However, the coefficient of the individualism index is insignificant.

Harvey (1997)), although none of the coefficients is statistically significant. Similar to Bekaert et al. (1997) and Chui et al. (2010), I find significantly positive effects of exchange rate volatility (Fxvol) and the market capitalization to GDP ratio (MCap) on stock market volatility. More importantly, I find that, unlike individualism, the coefficient of trust is not statistically significant.[9] This finding suggests that trust and individualism serve as measures of different cultural dimensions. The fact that excess trading volume and stock market volatility do not appear simultaneously in more trusted markets is allowed in disagreement models such as Hong and Stein (2007), who suggest that the errors made by less-than-fully rational investors can balance out in terms of their effects on stock prices but still cause large trading volumes if these investors interpret information differently.

## 4. Trust and Momentum

### 4.1. Trust and Momentum Profits: Portfolio Analysis

This section examines the association between the trust index and momentum returns in international stock markets. Based on their trust index, all sample markets are allocated into five groups, from low (bottom 20%) to high (top 20%).[10] I construct market-neutral momentum portfolios in each quintile, where winners and losers are first selected within each market, and then each market is given equal weight.

[Insert Table 1.3]

Panel A of Table 1.3 presents market-neutral momentum profits in the trust index-sorted quintile portfolios. In general, the momentum returns increase with the trust index. The average

[9] The univariate regression generates a qualitatively similar result - the estimated coefficient of trust is still insignificant (it is equal to -0.371, with a *t*-statistic of -1.06).
[10] My sorting starts from January 1990 since there are only ten countries with trust index and momentum returns from January 1981 in Wave 1 data.

monthly momentum return on the highest trust group is the largest (0.877% with a *t*-statistic of 6.48), whereas the average momentum return on the lowest trust portfolio is the smallest (0.092% with a *t*-statistic of 0.69). Except for the lowest trust group, the other four trust portfolios have significantly positive momentum returns. The average monthly return difference between the highest and lowest trust portfolios is 0.785%, with a *t*-statistic of 5.39, which is significant at the 1% level.[11] [12]

In Panel B, I report the winner, loser, and momentum returns in the trust-sorted quintile portfolios after I remove the markets with the trust index at the bottom 20% each month. I find that the momentum returns increase with the trust index as in Panel A. Although the momentum return on the lowest trust portfolio is higher and significant at the 10% level, it is still significantly lower than that on the highest trust portfolio, which has the highest return among the five trust portfolios. The average monthly return difference between these two trust portfolios is 0.666% and is significant at the 1% level, with a *t*-statistic of 4.19. Therefore, my findings in Panel A are not driven by a few outlier countries.

I further examine whether the three Fama and French factors explain the trust effect on momentum portfolios. In Panel C of Table 1.3, I calculate the risk-adjusted returns on winners and losers in each trust-sorted portfolio using the Fama-French (1993) three-factor model and obtain the momentum return by taking the difference between the risk-adjusted returns on the

[11] The choice of cutoffs does not affect the conclusion. I also create tercile trust groups and find the spread of momentum returns between the high and low trust groups is 0.605%, with a *t*-statistic of 4.94.

[12] I also construct pooled-market momentum portfolios in each trust-sorted quintile, where stocks are selected based on their ex-market performance in the pool of the markets for each quintile. The return spread between the highest and lowest trust portfolios is 0.682% per month, with a *t*-statistic of 3.19, also significant at the 1% level. One disadvantage of the pooled-market approach is that the trust-sorted momentum portfolios are dominated by stocks from large stock markets or markets with a large number of listed stocks. For the sake of brevity, I report the results using the market-neutral approach only in the paper. However, the pooled-market portfolio approach delivers qualitatively similar results and conclusions in my empirical analyses.

winner and loser portfolios. The results in Panel C present the same pattern: the average monthly momentum return on the lowest trust portfolio is insignificant, while the highest trust group has a significantly positive return. Their difference is 1.071% per month and significant at the 1% level, which shows that the trust effect on momentum is robust after risk adjustment.[13]

Firm size can affect momentum return. Hong, Lim, and Stein (2000) show that momentum profits decline with firm size. The relationship between firm size and momentum may result in a positive association between trust and momentum. To mitigate this possibility, I divide stocks into tercile groups based on their market capitalizations in each market every month and use stocks in the same size category to calculate momentum returns in Panel D. For the lowest trust quintile, only the small subsample has a significantly positive momentum return, while the momentum profits are insignificant for the other two size groups. By contrast, the momentum returns are all significantly positive for other trust-sorted quintile portfolios among all three size subsamples. The average monthly return differences between the highest and lowest trust portfolios are 0.559%, 0.875%, and 0.814% for the three size groups, respectively, and are all significant at the 1% level. My results suggest that the positive relationship between trust and momentum is not driven by the firm-size effect.

### 4.2. Post-holding Period Returns

Momentum literature documents that the post-holding period performance of momentum strategies depends on the holding horizon. For example, Jegadeesh and Titman (2001) show that the momentum strategy generates profits in the U.S. market during the first year; however, these returns reverse during the second or third year after portfolio formation. Griffin et al. (2003) and

[13] My results are also robust when I exclude the momentum crash periods from my sample, as in Barroso and Santa-Clara (2015) and Daniel and Moskowitz (2016). They are not included to save space but are available upon request.

Chui et al. (2010) document similar findings in international markets. In Table 1.4, I examine the profitability of trust-sorted momentum portfolios during the post-holding period.

[Insert Table 1.4]

Panel A of Table 1.4 shows the average monthly returns of the trust-sorted quintile portfolios for the three years after their formation date. Consistent with the findings in Table 1.3, the average monthly momentum returns during the first year are insignificantly negative for the lowest trust portfolio and significantly positive for the others. From the second year after the formation date, all trust-sorted momentum portfolios exhibit negative returns. However, the negative return of the lowest-trust portfolio is larger in magnitude. Therefore, the return difference between the highest and lowest trust quintiles remains positive until the third year after the portfolio formation date. The average is 0.184% in the 24 months from the beginning of the second year to the end of the third year, significant at the 1% level.

Panel B in Table 1.4 reports the post-holding period performance of momentum portfolios for the subsample of 31 developed markets with larger market capitalizations on average. I find that the trust effect on momentum is more pronounced in developed markets. For the highest trust quintile, the average monthly return in the first year is 0.850%, while the return on the same portfolio in the whole sample is 0.544%. Both are significant at the 1% level. However, momentum profits become insignificant and sometimes negative in the next two years.

By contrast, the lowest trust quintile in the developed market subsample generates an average monthly return of 0.092% in the first year after the formation date. This is insignificant, as in the whole sample. The return becomes negative and increases in magnitude over time. Consequently, the return difference between the highest and lowest trust quintiles remains

positive until the third year. It is significantly positive at the 5% level for each of the three years examined.

My findings for the trust-sorted quintile portfolios in Table 1.4 present a different pattern from the individualism-sorted portfolios in Chui et al. (2010). They show that countries with high individualism exhibit stronger momentum effects in the first year after the portfolio formation date. However, they also have stronger return reversals in the 24 subsequent months, compared to countries with low individualism. This difference once again emphasizes that although both trust and individualism have momentum effects in international markets, they represent distinct cultural factors and include different types of information. Further investigations on this issue will be conducted in the following analyses.

### 4.3. Trust and Momentum Profits: Regression Analysis

Using U.S. market data, extensive studies have examined the effects of firm characteristics and information environment on momentum returns. In this section, I investigate whether cross-market variations in these variables can explain momentum profits and whether they can affect the explanatory power of the trust measure. I run Fama-MacBeth (1973) regressions with momentum returns on the trust index and other possible determinants using the following model:

$$Mom_{jt} = \alpha + \beta \cdot Trust_{jy} + \gamma \cdot Control_{jy} + \varepsilon_{jt} ,$$

where $Mom_{jt}$ is the momentum return for market $j$ in month $t$, $Trust_{jy}$ is the trust index of market $j$ in year $y$, $Control_{jy}$ represents all control variables, and $\varepsilon_{jt}$ is the error term. The $t$-

statistics from these regressions are adjusted for autocorrelation and heteroscedasticity using Newey and West's (1987) robust standard errors.[14]

In Panel A of Table 1.5, I control for variables measuring the speed of information circulation and information uncertainty in the regression, often used in behavioral models. They have explanatory power for momentum returns at the firm level (Jegadeesh and Titman (1993); Daniel and Titman (1999); Lee and Swaminathan (2000); Hong, Lim, and Stein (2000); Zhang (2006); Verardo (2009)). These variables are also used by Chui et al. (2010) and Dou et al. (2016) in their regressions at the market level. Following the literature, I include the following control variables for each market: market trading volume (TN), stock market volatility (V), median firm size (SZ), the average number of analysts following a stock (Ana), average analyst forecast dispersion (Disp), book-to-market ratio (BM), and the volatility of the cash flow growth rate (Cfvol).

[Insert Table 1.5]

The results in Panel A confirm the significant and positive relationship between trust and momentum after controlling for other possible determinants of momentum returns. The coefficient of trust is 1.585 (with a *t*-statistic of 4.71) and is significantly positive at the 1% level. By contrast, market trading volume, stock market volatility, and cash flow volatility have significant but negative coefficients among all control variables.

Since the integrity of the financial market can also affect information circulation speed and reduce transaction costs, Chui et al. (2010) suggest that financial market development and institutional quality are associated with informational efficiency. I examine whether the trust

[14] The univariate regression (without other control variables) shows that the coefficient of trust is 1.908, with a *t*-statistic of 5.43.

effect on momentum persists after controlling for financial market development and institutional quality. Panels B and C of Table 1.5 show the results.

In Panel B, I include the total private credit to GDP ratio (Credit) as a measure of financial market development and the total equity market value to GDP ratio (MCap) to measure stock market development. I further add the average common language dummy variable (Lang) from Chan, Covrig, and Ng (2005), capital flow restrictions (Control), and financial market openness (Open) to the regression. My results indicate that a significant and positive relationship between trust and momentum remains after controlling for the above variables in the regression. The coefficient of trust is 1.358 (with a *t*-statistic of 2.82), which is significantly positive at the 1% level. Among these financial development variables, only the equity-to-GDP ratio (MCap) is significantly positive.

The institutional quality control variables include insider trading (Insider), ICRG investor protection (Protection), ICRG political risk (Political), and ICRG corruption index (Corruption). To control for transaction costs, I include the estimated trading costs (Tran) as suggested by Chan et al. (2005) in the regression. The results from Panel C show that the estimated coefficient of trust (1.551) is still significantly positive at the 1% level after including the institutional quality variables. The estimated coefficient of Protection is also significantly positive at the 10% level, while those of the other control variables are not significant.

In previous models, I have divided the control variables into three categories. In Panel D, I use a comprehensive model to examine the relationship between trust and momentum profits, including control variables from all three categories. However, due to the small sample size in the cross-market regressions, I include only control variables that are significant in the previous regressions. This group is composed of the market trading volume (TN), stock market volatility

(V), volatility of cash flow growth rate (Cfvol), the average number of analysts following a stock (Ana), equity-to-GDP ratio (MCap), and investor protection (Protection). The results in Panel D indicate that trust is still positively related to momentum returns; the coefficient on trust is 1.485 (with a *t*-statistic of 3.87), which is significantly positive at the 1% level.[15] Most of the other control variables are also significant, with the same signs as in the previous panels.[16]

## 5. Trust, Uncertainty Avoidance, and Individualism

### 5.1. Alternative Measures of Trust

So far, all the tests have been based on the trust measure of general survey respondents in different markets. This trust measure has been adopted by most trust studies investigating the relationship between trust and economic/financial outcomes. However, this trust measure does not necessarily accurately reflect the corresponding trust levels of economic and financial decision-makers. Specifically, the average person in a country may not be able to represent stock market participants whose reactions to information may cause momentum. To mitigate this concern, I adopt indirect and alternative approaches similar to Pevzner et al. (2015) to measure trust, Trust-HE, and Trust-HI, based on the corresponding subsets of respondents in the WVS/EVS.

[Insert Table 1.6]

[15] As a robustness check, I also run panel regressions with standard errors clustered by market and month (Petersen (2009)) for all the above models. The findings from these regressions are consistent with Table 1.5. The estimated trust coefficients are 1.859 (*t*-statistic=4.23), 1.523 (*t*-statistic=2.40), 1.451 (*t*-statistic=3.29), and 1.706 (*t*-statistic=3.43) accordingly. All of them are significant at the 5% level.

[16] Griffin, Ji, and Martin (2003) use the GDP growth rate and inflation rate as macroeconomic factors to explain different momentum performances in international stock markets. After controlling for these two variables, I find that trust is still positively and significantly related to momentum returns. The coefficient of trust is 1.257 (*t*-statistic=3.78). The coefficient of the inflation rate is -0.036 (*t*-statistic=-2.87), while the coefficient of the GDP growth rate is insignificant.

The WVS/EVS data contain the respondents' income and educational information. The first alternative measure of trust, Trust-HE, is based on the answers from survey participants who achieved a university level or above education. The second alternative measure of trust, Trust-HI, is created based on survey responses from individuals with income above the median of a market.[17] The advantage of these two measures is that individuals with higher income and higher education are more likely to invest in stock markets. Therefore, a trust index based on their responses can more accurately reflect stock investors' characteristics, which can cause momentum. I re-estimate the regressions using two alternative trust measures with control variables, as shown in Table 1.5. Table 1.6 presents the results. I find that these two alternative trust measures have significantly positive coefficients in all models at the 5% level, which confirms the results based on the average trust level of people in a market.[18]

### 5.2. Trust and Uncertainty Avoidance

Trust is "the subjective probability with which an agent assesses whether another agent or group of agents will perform a particular action" (Gambetta (2000), p. 217). According to Hofstede (2001), uncertainty avoidance is "how a society deals with the fact that the future can never be known: Should we try to control it or just let it happen?" and represents a cultural dimension that differs from individualism. People in high uncertainty-avoidance cultures are less tolerant of unknown and unusual circumstances. Therefore, people with high uncertainty avoidance levels are more likely to take immediate action to exclude ambiguity.[19] Dasgupta (2002) argues that trust plays a role when information asymmetry exists between two parties and

[17] I also create the trust index using answers from individuals with income in the top quintile and find consistent results.
[18] The univariate regression analyses show that the Trust-HE and Trust-HI coefficients are 1.890 (*t*-statistic=6.57) and 1.765 (*t*-statistic=5.22). Both are significant at the 1% level.
[19] In the circumstance of stock investment, the actions may include requesting more information and/or higher dividends when investors are at an information disadvantage and uncertain about their interests.

the next move of one party, who is at an information disadvantage, depends on his ignorance of these disadvantages. That is, trust is effective in a low-uncertainty avoidance scenario. Dou et al. (2016) find that uncertainty avoidance is negatively associated with earnings momentum profits. Therefore, trust may simply be a proxy for uncertainty avoidance, and investors' uncertainty avoidance may drive the trust effect on momentum.[20] To investigate this possibility, I examine how trust affects momentum returns in international stock markets after controlling for uncertainty avoidance in Panel A of Table 1.7. I classify markets into three groups–low, medium, and high–based on Hofstede's uncertainty avoidance index (UAI). Among the UAI-sorted groups of markets, I further create three trust-sorted portfolios based on each market's trust index.

[Insert Table 1.7]

The results in Panel A reveal that the trust effect on momentum returns is statistically significant in all three UAI-sorted portfolios. In the high UAI group, the average return difference between the high- and low-trust portfolios is 0.542% per month, with a *t*-statistic of 2.24. In the low and medium UAI groups, the spreads in average monthly returns between the high and low trust portfolios are 0.535% (*t*-statistic=2.91) and 0.877% (*t*-statistic=3.32), respectively. All are significant at the 5% level. Controlling for UAI, the average return difference between the high- and low-trust portfolios is 0.651% per month, with a *t*-statistic of 5.68, significant at the 1% level. Among the nine UAI-Trust-sorted portfolios, only three portfolios from markets with high/medium uncertainty avoidance and low trust and high uncertainty avoidance and medium trust do not have significant momentum profits. The

[20] The correlation coefficient between trust and uncertainty avoidance is -0.57, significant at the 1% level.

momentum returns of the three portfolios with high trust are significantly positive at the 1% level.

In Panel B, I exchange the order: I first control for trust and then construct tercile UAI-sorted portfolios within each trust group. The results suggest that UAI has no explanatory power for momentum after controlling for trust. None of the return differences between the high- and low-UAI portfolios are significant once I control for the trust level. On average, the return difference between the high- and low-UAI portfolios is only 0.012% per month, with a *t*-statistic of 0.09. Among the nine Trust-UAI-sorted portfolios, six in the medium- and high-trust groups have significant momentum returns at the 5% level. By contrast, momentum profits do not exist in the three portfolios within the low-trust group, and their economic and statistical significance is much lower than those in the medium- and high-trust groups.

In summary, the results from these two dependent sorting methods suggest that investors' uncertainty avoidance cannot explain the trust effect on momentum. Instead, trust drives the uncertainty avoidance effect on momentum. Therefore, trust has stronger explanatory power for momentum profitability.

### 5.3. Trust and Individualism

I show that both individualism and trust are positively related to momentum profits in international stock markets.[21] However, the momentum portfolios sorted by individualism and trust have different post-holding period performances. Earlier findings indicate that a market with a high trust level has more trading volume, but stock market volatility is not significantly higher, whereas individualism is positively associated with both trading volume and market

[21] The correlation coefficient between trust and individualism is 0.51, significant at the 1% level.

volatility. According to Hofstede (2001), individualism reflects the degree to which people focus on their internal attributes, such as their own abilities, to differentiate themselves from others. By definition, trust and individualism capture different aspects of cultural effects on the stock market. In this section, I conduct more detailed analyses to understand whether these two measures include separate information or simply proxy for one another in terms of their predictability of momentum returns in international markets.

To answer this question, I first examine the effects of trust and individualism on momentum profits in two subsamples: 31 developed and 34 developing markets. Developed markets are those classified as advanced economies by the International Monetary Fund (IMF), while others are considered developing markets. The motivation for this examination is that the influential factors related to momentum, such as the information environment, market development, and institutional quality, can be fairly dissimilar between advanced and non-advanced economies. The aggregated difference in these factors may affect the effect of trust or individualism on momentum. The results for individualism and trust are summarized in Panels A and B of Table 1.8, respectively.

[Insert Table 1.8]

Panel A presents the effect of individualism on momentum profits in both the developed and developing markets. Consistent with Chui et al. (2010), I find that the individualism effect on momentum profits is stronger in the developed markets. All momentum portfolios generate significantly positive momentum profits in this subsample, except in the markets with the lowest individualism. The momentum return spread between the high- and low-individualism countries is 0.846% per month, significant at the 1% level. By contrast, the momentum returns in most

individualism-sorted developing markets are insignificant, and the return spread between the high- and low-individualism countries is insignificant.

Panel B reports the trust effect on momentum returns in the developed and developing markets. The patterns are similar to those in Panel A: the momentum return spread between the high- and low-trust markets in the developed market sample is 1.077%, with a *t*-statistic of 5.58, much higher than the momentum profits in the sample in Panel A of Table 1.3. In contrast to the results in developed markets, trust has no predictive power for momentum profits in the developing subsample, as both the momentum returns and the return spread between the high- and low-trust markets are insignificant.[22]

[Insert Table 1.9]

In Panels A and B of Table 1.9, I conduct two dependent sorts, as shown in Table 1.7. The results in Panel A reveal that the trust effect on momentum returns is statistically significant only in the medium individualism-sorted portfolios. In the high individualism group, the average return difference between the high- and low-trust portfolios is 0.277% per month and is insignificant. In the medium individualism group, the return spread is 0.588%, which is significant at the 1% level. The return difference is 0.132% and insignificant in low individualism markets. Controlling for individualism, the average return difference between the high- and low-trust portfolios is 0.332% per month, significant at the 1% level.

In Panel B, I first control for trust and then construct three individualism-sorted portfolios for each trust group. My results indicate that the average return difference between the high- and

[22] Low-trust markets dominate the developing subsample. Therefore, the trust levels of high-trust markets in this subsample are not necessarily high in the whole sample.

low-individualism portfolios is statistically significant in both the medium- and high-trust portfolios, but the difference is very small and insignificant in the low-trust markets. On average, the return difference between the high- and low-individualism portfolios is 0.554% per month, significant at the 1% level after controlling for trust.

In summary, the results from these two dependent sortings suggest that trust and individualism cannot replace each other in terms of their effect on momentum profits. When I control for one of them, another variable still affects the momentum. Therefore, the momentum predictability of trust and individualism represent different information sets.

To further differentiate the information included in trust and individualism, I develop the spanning tests in Table 1.10, as in Novy-Marx (2012). These spanning tests regress a test strategy's returns on the returns to one or more explanatory strategies. An insignificant intercept suggests that the test strategy is within the span of the explanatory strategies and does not add significantly to the investment opportunity set. By contrast, a statistically significant intercept suggests that the test strategy includes some unique information, which helps span the investment opportunity set further. The test strategies used in these spanning tests are the differences between the high and low trust- and individualism-sorted momentum portfolios, respectively.

[Insert Table 1.10]

In Panel A, I regress the high- and low-trust momentum portfolio return spread on the return difference between the two individualism momentum portfolios (and the three Fama-French factors). The intercepts using the full sample are all highly significant at the 1% level, suggesting that the trust-based momentum strategy has some unique information not included in

the individualism-based momentum strategy. The loadings on individualism momentum portfolios are also highly significant, showing that these two strategies are highly correlated.

In Panel B, I exchange orders between these two momentum strategies. The results indicate that both intercepts are significant at the 1% level when the return difference between the high- and low-trust momentum portfolios (and the three Fama-French factors) are included in the regression. The loadings on the trust momentum portfolios are also highly significant. This pattern is the same as that in Panel A. The last two columns conduct the same regressions in the subsample of developed markets and provide consistent results in general, as in the whole sample. In summary, the results in these two panels suggest that trust and individualism represent different cultural dimensions and can expand the investment opportunity set when combined.

Suppose that the different information captured by trust and individualism leads to variations in portfolio performance across international markets. It is reasonable to expect that a variable incorporating both trust and individualism information should have a stronger explanatory power than any of these two cultural variables. For this purpose, I create a new variable, MIX, for each market, calculated as the product of its trust and individualism rankings within all markets.[23] For example, the markets with the highest and lowest trust (individualism)-sorted quintiles are ranked 5 and 1, respectively. I then use the same procedure as in Table 1.3 to construct five MIX-sorted momentum portfolios and examine the effect of MIX on their performance.

[Insert Table 1.11]

[23] The product of the trust and individualism rankings can help mitigate the bias when only one of the two cultural variables is ranked high. It is more effective than other measures, such as the sum or the maximum of the rankings of these two variables.

Table 1.11 reports the effects of trust, individualism, and MIX on momentum profits. Panel A shows that the average monthly return on the zero-cost momentum portfolio is 1.169% higher in markets with MIX indexes in the top 20% than those with indexes in the bottom 20%, significant at the 1% level. Panel B shows the trust effect on momentum and reports that markets with high trust indexes have 0.785% higher monthly momentum returns than markets with low trust indexes (as shown in Panel A of Table 1.3). The difference between these two panels, reported in Panel C, indicates that the return difference between the high and low MIX momentum portfolios is 0.384% higher than between the high and low trust momentum portfolios. It is significant at the 1% level. Panel D confirms the finding of Chui et al. (2010) that individualism positively affects momentum returns. The difference between the high and low individualism portfolios is 0.903% and significant at the 1% level. Panel E compares the portfolio performance sorted by individualism and MIX indexes. Compared to individualism-sorted momentum portfolios, the average monthly return difference between the high and low MIX-sorted momentum portfolios is significantly higher—0.266% with a *t*-statistic of 1.79. Interestingly, after comparing the last column in Panel C (MIX minus Trust) and Panel E (MIX minus Individualism), I find that MIX improves the trust-sorted momentum portfolio performance significantly in quintiles 4 and 5 with high trust, and it improves the individualism-sorted momentum portfolio performance significantly in quintiles 2 and 3 with relative low individualism. The return on the lowest MIX momentum portfolio is negative, lower than that of the lowest trust or individualism momentum portfolios in Panel C and Panel E. These results suggest that both trust and individualism contribute to the superior performance of MIX in

explaining momentum profits. Therefore, trust and individualism should capture different information explaining momentum profits in international markets.[24]

## 6. Conclusion

As a cultural and societal factor, trust has been investigated in several economics and corporate finance studies. However, the effect of trust on asset pricing, in general, has not been fully examined. Guiso et al. (2004, 2008) find that trust encourages stock market participation; however, they do not discuss how trust-induced participation can affect the stock market. Starting from this, I investigate the link between trust and momentum anomaly. Using international data, I find that momentum profits are significantly higher in more trusted markets. This result holds after a comprehensive set of control variables and alternative trust measures are included. The positive relationship between trust and momentum is robust after risk adjustment and across size portfolios and is more pronounced in advanced economies.

Empirical evidence supports that trust increases the proportion of naive investors and adds disagreement in a market and that the trust effect on momentum is associated with disagreement among investors. I find that trust is positively related to trading volumes and has no significant impact on stock market volatility. A possible explanation for this observation is that trust-related disagreement generates trades, but these trading activities are idiosyncratic and cancel each other out without generating volatile prices. The post-holding period performance examination presents a different pattern from the individualism effect on momentum.

[24] To further confirm the robustness of the trust effect on momentum, I add individualism in the regression models in Table 1.5. The results show that the trust coefficients in all of those models remain significant. The corresponding trust coefficients are 0.876 (*t*-statistic=2.62), 0.923 (*t*-statistic=1.85), 1.273 (*t*-statistic=3.21), and 0.951 (*t*-statistic=2.27) in the behavioral model, financial market development model, institutional quality model, and the comprehensive model, respectively.

Further tests indicate that trust has stronger explanatory power than uncertainty avoidance on momentum profitability. However, trust and individualism cannot replace each other in terms of their effects on momentum profits. When combined, the new measure, MIX, can improve momentum portfolio performance. My results shed new light on the cultural forces behind cross-country variations in momentum profits and suggest an alternative explanation that should be further examined in the future.

## Appendix

### Variable Definitions

| Variable | Source | Definition |
|---|---|---|
| **Related to firm characteristics** | | |
| Market trading volume (TN) | DataStream | The dollar value of the DataStream Global index's trading volume in a market, adjusted by its market capitalization |
| Stock market volatility (V) | DataStream | The average of the squared returns on individual stocks in a market |
| Median firm size in a market (Size) | DataStream | The median of the average firm size in a market |
| Book-to-market ratio (BM) | DataStream | The book-to-market ratio of the DataStream global index in a market |
| The volatility of cash flow growth rate (Cfvol) | DataStream | The standard deviation of the DataStream global index's cash flow growth rate in the past five years (minimum three years) in a market |
| Analyst coverage (Ana) | I/B/E/S | The average number of analysts providing one-year ahead earnings forecasts for a firm in a market |
| Analyst forecast dispersion (Disp) | I/B/E/S | The average of the coefficient of variations in firms' one-year ahead earnings forecast in a market |
| **Related to market development** | | |
| Ratio of total private credit to GDP (Credit) | World Bank | Total private credit divided by the market's GDP in a given year |
| Ratio of total equity market value to GDP (MCap) | DataStream; World Bank | Total equity market value divided by the market's GDP in a given year |
| Average common language dummy variable (Lang) | Chan, Covrig, and Ng (2005) | The average score of common language dummy (equals 1 if two markets share a common language, 0 otherwise) |
| Index on capital flow restrictions (Control) | Chan, Covrig, and Ng (2005) | A lower value indicates more capital controls |
| Stock market openness indicator (Open) | Chinn-Ito Website | A higher value indicates a financial market is more open |

Continued

**Variable Definitions (Continued)**

| Variable | Source | Definition |
|---|---|---|
| **Related to institutional quality** | | |
| Insider trading (Insider) | Bhattacharya and Daouk (2002) | An indicator variable equals 1 in years after the first insider trading law prosecution, 0 otherwise |
| Transaction cost index (Trans) | Chan, Covrig, and Ng (2005) | A higher value indicates a higher transaction cost |
| Investor protection index (Protection) | ICRG | A higher value indicates a higher level of investor protection |
| Political risk index (Political) | ICRG | A higher value indicates a lower political risk |
| Corruption index (Corruption) | ICRG | A higher value indicates a lower level of corruption |
| **Related to cultural factors** | | |
| Individualism (IDV) | Hofstede (2001) | A higher value indicates a higher degree of individualism |
| Uncertainty Avoidance (UAI) | Hofstede (2001) | A higher value indicates a higher degree of uncertainty avoidance |
| **Related to macroeconomic factors** | | |
| Volatility of exchange rates (Fxvol) | DataStream | The coefficient of variations in the exchange rates of a market's currency against US dollars in the past 60 months (minimum 24 observations required) |
| Inflation growth (Inflation) | IMF | Annual CPI percentage change in a market |
| GDP growth (GDP) | World Bank | The nominal GDP growth rate in a market |

**Table 1.1 Summary Statistics**

There are 65 stock markets in the sample. Each market is required to have a WVS/EVS trust score. The U.S. market data is from the CRSP database. The data of all the other markets comes from DataStream. Within each market and each month, I winsorize returns at the 1st and 99th percentiles. I set any monthly return of more than 1000% as missing. Further, each market should have a minimum of 30 stocks each month during the sample period and should have at least five years of return data to be included in the sample. I exclude all the non-common stocks and cross-listed stocks are only retained in their home markets to avoid the double-counting issue. This table presents the market name, sample period, trust index (%), total market value (in millions of US dollars), and numbers of stocks in the last month of the sample period for each market. To match the availability of trust data and DataStream data, the earliest month of all markets is set to January 1981. Based on the past 6-month cumulative returns, all stocks in each month are ranked in ascending order for each market and then divided into five groups. The top 20 percent stocks are assigned as the winner portfolio and the bottom 20 percent stocks are assigned as the loser portfolio. Those winner and loser portfolios are held for six months with equal weight. I skip one month after the formation period to avoid the market microstructure issue. Returns on the overlapping winner and loser portfolios are calculated as the average return on the six winner and the six loser portfolios. Following Chui et al. (2010), I use the value-weighted market return to replace the missing return and rebalance the portfolio if there is a delisted stock in the holding period. The returns of winners, losers, and momentum portfolios are reported in the last three columns for each market. The *t*-statistics are reported in parentheses.

| Summary Statistics | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Market | Period | Trust Index | Market Value (U.S.$ Million) | No. of Firms | Winner (W) | | Loser (L) | | W Minus L | |
| Argentina | 1994.08-2019.12 | 20.52 | 30160 | 68 | 1.126 | (2.07) | 1.203 | (1.93) | -0.077 | (-0.21) |
| Australia | 1981.01-2019.12 | 48.98 | 1292353 | 1889 | 1.484 | (3.92) | 1.111 | (2.54) | 0.372 | (1.75) |
| Austria | 1981.01-2019.12 | 37.62 | 117601 | 78 | 1.675 | (5.64) | 0.613 | (1.87) | 1.063 | (3.93) |
| Bangladesh | 1993.02-2019.12 | 19.12 | 32875 | 340 | 2.138 | (4.13) | 1.304 | (2.35) | 0.834 | (2.30) |
| Belgium | 1981.01-2019.12 | 31.64 | 371539 | 123 | 1.429 | (6.36) | 0.291 | (1.09) | 1.138 | (6.20) |
| Brazil | 1995.08-2019.12 | 6.34 | 839122 | 322 | 1.810 | (3.68) | 1.868 | (2.89) | -0.058 | (-0.17) |
| Bulgaria | 2007.04-2019.12 | 23.95 | 14713 | 141 | 1.319 | (2.55) | 2.020 | (3.22) | -0.701 | (-1.48) |
| Canada | 1981.01-2019.12 | 46.03 | 1884890 | 762 | 1.691 | (5.15) | 0.869 | (2.11) | 0.821 | (3.70) |
| Chile | 1990.08-2019.12 | 17.76 | 176413 | 143 | 1.784 | (5.58) | 0.967 | (2.91) | 0.817 | (4.15) |
| China | 1993.12-2019.12 | 58.24 | 6903025 | 2957 | 1.432 | (2.01) | 1.198 | (1.70) | 0.235 | (1.08) |
| Colombia | 1994.01-2019.12 | 8.95 | 110960 | 41 | 1.406 | (3.99) | 0.932 | (2.10) | 0.475 | (1.24) |
| Croatia | 2006.11-2019.12 | 20.74 | 20442 | 98 | 0.178 | (0.42) | 0.019 | (0.03) | 0.159 | (0.36) |
| Cyprus | 1996.08-2019.12 | 9.79 | 2892 | 52 | 1.362 | (1.82) | 1.777 | (2.01) | -0.415 | (-0.71) |
| Czech Republic | 1994.09-2006.08 | 26.69 | 42757 | 31 | 1.547 | (3.25) | 1.134 | (2.01) | 0.413 | (1.04) |

Continued

**Table 1.1 (Continued) Summary Statistics**

| Market | Period | Trust Index | Market Value (U.S.$ Million) | No. of Firms | Winner (W) | | Loser (L) | | W Minus L | |
|---|---|---|---|---|---|---|---|---|---|---|
| Denmark | 1981.01-2019.12 | 66.07 | 414587 | 170 | 1.655 | (6.54) | 0.495 | (1.70) | 1.160 | (6.50) |
| Egypt | 1997.10-2019.12 | 21.06 | 39710 | 211 | 0.917 | (1.83) | 0.470 | (0.91) | 0.447 | (1.24) |
| Finland | 1989.04-2019.12 | 60.26 | 280043 | 182 | 1.397 | (4.19) | 0.252 | (0.61) | 1.146 | (4.20) |
| France | 1981.01-2019.12 | 23.82 | 2756262 | 773 | 1.553 | (5.83) | 0.538 | (1.69) | 1.015 | (5.77) |
| Germany | 1981.01-2019.12 | 38.02 | 1944966 | 566 | 1.080 | (4.51) | 0.042 | (0.12) | 1.038 | (4.82) |
| Greece | 1989.02-2019.12 | 17.83 | 51332 | 150 | 1.573 | (2.93) | 1.405 | (2.37) | 0.168 | (0.46) |
| Hong Kong | 1981.01-2019.12 | 42.96 | 2804579 | 2036 | 1.584 | (3.71) | 0.860 | (1.79) | 0.725 | (3.15) |
| Hungary | 1996.10-2019.12 | 25.90 | 31690 | 37 | 3.026 | (4.70) | 2.023 | (2.56) | 1.003 | (1.42) |
| India | 1991.02-2019.12 | 31.04 | 2125913 | 4217 | 2.029 | (3.81) | 1.850 | (3.01) | 0.179 | (0.57) |
| Indonesia | 1991.05-2019.12 | 33.12 | 480763 | 641 | 1.316 | (2.27) | 1.576 | (2.13) | -0.260 | (-0.82) |
| Ireland | 1981.01-2016.09 | 40.85 | 116763 | 36 | 2.045 | (4.62) | 1.535 | (2.72) | 0.509 | (1.05) |
| Israel | 1987.02-2019.12 | 23.46 | 153659 | 438 | 1.072 | (2.82) | 0.503 | (1.18) | 0.569 | (2.71) |
| Italy | 1981.01-2019.12 | 30.54 | 701924 | 426 | 1.149 | (3.77) | -0.028 | (-0.08) | 1.176 | (5.92) |
| Japan | 1981.01-2019.12 | 40.29 | 5801448 | 3763 | 0.843 | (2.84) | 0.822 | (2.43) | 0.021 | (0.12) |
| Jordan | 2006.11-2019.12 | 22.05 | 20207 | 151 | 0.169 | (0.66) | -0.044 | (-0.14) | 0.213 | (0.86) |
| Kuwait | 2005.01-2019.12 | 30.00 | 96983 | 118 | 0.415 | (1.06) | 0.269 | (0.52) | 0.146 | (0.45) |
| Luxembourg | 1993.07-2005.11 | 27.91 | 19812 | 30 | 1.759 | (3.96) | 0.825 | (1.77) | 0.934 | (2.06) |
| Malaysia | 1987.02-2019.12 | 12.31 | 377787 | 703 | 1.248 | (2.67) | 0.914 | (1.57) | 0.334 | (1.21) |
| Mexico | 1989.02-2019.12 | 19.88 | 248058 | 93 | 1.712 | (4.76) | 0.981 | (2.34) | 0.731 | (2.53) |
| Montenegro | 2012.03-2019.12 | 28.26 | 1073 | 73 | 0.467 | (1.04) | 0.931 | (1.51) | -0.464 | (-0.78) |
| Morocco | 1994.08-2019.12 | 16.15 | 64696 | 70 | 1.408 | (4.80) | 0.692 | (2.34) | 0.716 | (2.99) |
| Netherlands | 1981.01-2019.12 | 56.30 | 813596 | 114 | 1.697 | (6.41) | 0.292 | (0.87) | 1.405 | (6.38) |
| New Zealand | 1989.02-2019.12 | 54.12 | 106150 | 127 | 1.893 | (5.61) | 0.603 | (1.40) | 1.290 | (4.37) |
| Nigeria | 2010.10-2019.12 | 18.71 | 28787 | 136 | 0.227 | (0.37) | -0.793 | (-1.32) | 1.020 | (2.61) |
| Norway | 1981.02-2019.12 | 69.26 | 308146 | 334 | 2.031 | (5.78) | 0.571 | (1.38) | 1.460 | (5.25) |
| Pakistan | 1992.02-2019.12 | 24.27 | 48686 | 416 | 1.299 | (3.36) | 1.694 | (3.45) | -0.395 | (-1.38) |
| Peru | 1992.12-2019.12 | 7.14 | 86945 | 104 | 2.141 | (7.05) | 2.237 | (4.13) | -0.096 | (-0.19) |
| Philippines | 1991.01-2019.12 | 5.58 | 200359 | 193 | 1.767 | (3.79) | 1.995 | (3.32) | -0.228 | (-0.53) |

Continued

**Table 1.1 (Continued) Summary Statistics**

| Market | Period | Trust Index | Market Value (U.S.$ Million) | No. of Firms | Winner (W) | | Loser (L) | | W Minus L | |
|---|---|---|---|---|---|---|---|---|---|---|
| Poland | 1996.08-2019.12 | 24.41 | 143864 | 712 | 1.304 | (2.56) | 0.486 | (0.86) | 0.819 | (2.87) |
| Portugal | 1989.02-2019.12 | 16.99 | 57099 | 44 | 1.229 | (3.76) | 1.613 | (3.17) | -0.384 | (-0.87) |
| Qatar | 2007.08-2019.12 | 21.44 | 148688 | 44 | 1.214 | (2.45) | 0.549 | (1.02) | 0.665 | (1.78) |
| Romania | 1998.10-2019.12 | 14.65 | 22759 | 160 | 2.606 | (4.94) | 2.630 | (4.40) | -0.024 | (-0.05) |
| Russia | 1998.10-2019.12 | 27.84 | 729459 | 185 | 2.623 | (5.15) | 3.178 | (4.49) | -0.554 | (-1.19) |
| Saudi Arabia | 2006.04-2019.12 | 53.04 | 2354120 | 190 | 0.327 | (0.44) | 0.123 | (0.15) | 0.204 | (0.44) |
| Serbia | 2010.05-2019.12 | 18.40 | 3119 | 32 | 0.769 | (1.42) | 0.475 | (0.83) | 0.295 | (0.55) |
| Singapore | 1984.02-2019.12 | 29.07 | 432584 | 323 | 1.183 | (3.26) | 0.832 | (1.66) | 0.350 | (1.22) |
| Slovakia | 2007.04-2013.09 | 20.20 | 2940 | 30 | 1.140 | (1.53) | 1.116 | (1.53) | 0.025 | (0.03) |
| Slovenia | 2007.04-2014.10 | 20.60 | 7158 | 31 | 1.615 | (1.60) | 2.240 | (1.30) | -0.625 | (-0.46) |
| South Africa | 1981.01-2019.12 | 22.15 | 439003 | 218 | 1.781 | (5.05) | 0.683 | (1.87) | 1.098 | (4.91) |
| South Korea | 1985.08-2019.12 | 31.80 | 1418162 | 2291 | 1.426 | (2.79) | 1.283 | (1.91) | 0.143 | (0.33) |
| Spain | 1988.04-2019.12 | 31.83 | 742869 | 229 | 1.068 | (3.52) | 0.365 | (0.90) | 0.704 | (2.79) |
| Sweden | 1983.02-2019.12 | 64.97 | 639656 | 719 | 1.558 | (4.83) | 0.617 | (1.45) | 0.940 | (3.59) |
| Switzerland | 1981.01-2019.12 | 49.39 | 1733088 | 211 | 1.371 | (5.87) | 0.190 | (0.70) | 1.181 | (7.03) |
| Taiwan | 1989.05-2019.12 | 30.91 | 1180527 | 928 | 0.837 | (1.66) | 0.637 | (1.13) | 0.200 | (0.76) |
| Thailand | 1988.02-2019.12 | 35.15 | 509101 | 726 | 1.576 | (3.47) | 1.118 | (2.06) | 0.458 | (1.53) |
| Tunisia | 2007.01-2019.12 | 15.12 | 8314 | 77 | 1.097 | (2.71) | -0.206 | (-0.49) | 1.303 | (3.68) |
| Turkey | 1989.02-2019.12 | 10.57 | 185055 | 416 | 2.233 | (2.98) | 2.790 | (3.43) | -0.558 | (-1.68) |
| Ukraine | 2007.04-2016.04 | 28.12 | 2517 | 30 | -0.389 | (-0.42) | 1.689 | (1.18) | -2.077 | (-1.64) |
| United Kingdom | 1981.01-2019.12 | 36.78 | 3226364 | 1370 | 1.274 | (4.88) | -0.091 | (-0.29) | 1.365 | (8.47) |
| United States | 1981.01-2019.12 | 40.18 | 31600673 | 3621 | 1.209 | (4.60) | 0.171 | (0.48) | 1.038 | (4.83) |
| Vietnam | 2008.05-2019.12 | 40.31 | 111945 | 363 | 1.010 | (1.65) | 0.375 | (0.48) | 0.635 | (1.73) |

**Table 1.2 Trust, Market Trading Volume, and Average Stock Volatility**

Panel A represents the estimated OLS coefficients of factors related to market trading volume. In each month, market trading volume is measured by the dollar trading volume of the market index available in DataStream adjusted by its corresponding market capitalization. I regress the natural logarithm of the market trading volume (LnTN) on the trust index (Trust) from WVS/EVS, the ratio of total private credit to GDP (Credit), insider trading (Insider), exchange rate volatility (Fxvol), ICRG political risk (Political), and the natural logarithm of monthly average stock volatility (LnV). Panel B reports the estimated coefficients in the average stock volatility regression. I regress the natural logarithm of average stock volatility on the trust index (Trust) from WVS/EVS, the ratio of total private credit to GDP (Credit), the ratio of market capitalization to GDP (MCap), insider trading (Insider), exchange rate volatility (Fxvol), ICRG political risk (Political), nominal GDP growth rate (GDP), and market openness (Open). The sample periods are from November 1995 to December 2019. I calculate standard errors clustered by market and month following Petersen (2009), and the corresponding *t*-statistics are reported in parentheses.

| Panel A: Market Trading Volume | | | Panel B: Average Stock Volatility | | |
|---|---|---|---|---|---|
| Intercept | 2.639 | (3.83) | Intercept | -3.866 | (-8.95) |
| Trust | 1.415 | (2.68) | Trust | -0.035 | (-0.09) |
| Credit | 0.007 | (3.50) | Credit | -0.002 | (-1.05) |
| Insider | 0.294 | (1.36) | Insider | 0.155 | (1.03) |
| Fxvol | 1.862 | (2.23) | Fxvol | 0.879 | (2.04) |
| Political | -0.635 | (-0.60) | Political | 0.665 | (1.04) |
| LnV | 0.026 | (0.39) | MCap | 0.001 | (2.03) |
| | | | GDP | -0.015 | (-1.21) |
| | | | Open | -0.391 | (-1.42) |
| $R^2$(%) | 20.14 | | $R^2$(%) | 2.30 | |

**Table 1.3 Trust and Momentum Profits**

This table reports the average monthly momentum profits for the market-neutral portfolio sorted by the trust index. At the end of each month, all the sample markets are ranked into quintile groups, from low (bottom 20%) to high (top 20%) based on their trust index. The market-neutral portfolio is formed with equal-weighted market-specific momentum portfolios within these five trust-sorted groups. Panel A reports the winner, loser, and momentum returns in the trust-sorted quintile portfolios. In Panel B, I report the winner, loser, and momentum returns in the trust-sorted quintile portfolios after I remove the markets with the trust index at the bottom 20% each month. In Panel C, I report the risk-adjusted returns for the winner, loser, and momentum portfolios in Panel A from the Fama-French three-factor model. In Panel D, at the end of each month, stocks in a market are allocated into three groups, from low to high, based on their market capitalization. The small-size, medium-size, and large-size stocks are used separately to calculate momentum profits as in Panel A. The last row in each panel (High Minus Low) reports the return difference between the high-trust group and low-trust group. The average monthly returns are reported in percentages and in U.S. dollars. The sample periods are from January 1990 to December 2019 in Panels A, B, and D, and from October 1998 to December 2019 in Panel C due to limited data availability. The *t*-statistics are reported in parentheses.

| Panel A: Trust-sorted Portfolios | | | |
|---|---|---|---|
| Trust Index | Winner (W) | Loser (L) | W Minus L |
| Low | 1.635 | 1.543 | 0.092 |
| | (6.39) | (5.21) | (0.69) |
| 2 | 1.351 | 0.769 | 0.582 |
| | (5.62) | (2.74) | (3.80) |
| Medium | 1.230 | 0.759 | 0.472 |
| | (5.03) | (2.39) | (2.86) |
| 4 | 1.243 | 0.456 | 0.787 |
| | (5.37) | (1.53) | (5.19) |
| High | 1.417 | 0.541 | 0.877 |
| | (5.58) | (1.81) | (6.48) |
| High Minus Low | -0.218 | -1.002 | 0.785 |
| | (-1.09) | (-4.40) | (5.39) |
| Panel B: Trust-sorted Portfolios (Trimmed Sample) | | | |
| Low | 1.423 | 1.098 | 0.325 |
| | (5.67) | (3.67) | (1.94) |
| 2 | 1.276 | 0.874 | 0.402 |
| | (5.78) | (3.15) | (2.51) |
| Medium | 1.185 | 0.428 | 0.757 |
| | (4.79) | (1.43) | (4.92) |
| 4 | 1.380 | 0.695 | 0.685 |
| | (5.54) | (2.14) | (4.16) |
| High | 1.540 | 0.550 | 0.990 |
| | (5.17) | (1.18) | (6.91) |
| High Minus Low | 0.117 | -0.548 | 0.666 |
| | (0.61) | (-2.68) | (4.19) |

Continued

**Table 1.3 (Continued) Trust and Momentum Profits**

| Panel C: Adjusted Returns from Fama-French Three Factors | | | |
|---|---|---|---|
| Trust Index | Winner (W) | Loser (L) | W Minus L |
| Low | 1.725 | 1.806 | -0.081 |
| | (4.58) | (3.80) | (-0.41) |
| 2 | 0.911 | 0.448 | 0.463 |
| | (2.36) | (0.93) | (1.79) |
| Medium | 1.243 | 0.565 | 0.679 |
| | (3.74) | (1.20) | (2.54) |
| 4 | 1.093 | 0.241 | 0.852 |
| | (3.69) | (0.62) | (4.17) |
| High | 1.161 | 0.171 | 0.990 |
| | (3.79) | (0.46) | (5.80) |
| High Minus Low | -0.564 | -1.635 | 1.071 |
| | (-2.27) | (-5.22) | (6.01) |
| Panel D: Control for Size | | | |
| Trust Index | Small | Medium | Large |
| Low | 0.428 | -0.082 | 0.046 |
| | (2.90) | (-0.54) | (0.32) |
| 2 | 1.036 | 0.312 | 0.474 |
| | (6.59) | (1.84) | (2.86) |
| Medium | 0.713 | 0.338 | 0.409 |
| | (4.08) | (1.93) | (2.35) |
| 4 | 1.013 | 0.690 | 0.746 |
| | (5.96) | (4.33) | (4.96) |
| High | 0.987 | 0.794 | 0.860 |
| | (6.42) | (5.63) | (6.53) |
| High Minus Low | 0.559 | 0.875 | 0.814 |
| | (3.50) | (5.15) | (5.15) |

**Table 1.4 Trust and Post-Holding Period Returns on Momentum Portfolios**

This table reports the average monthly returns (in percentages) of trust-sorted market-neutral momentum portfolios for the whole sample (Panel A) and the subsample of developed markets (Panel B). The 31 developed markets are classified as advanced economies by the IMF. I skip one month between the formation and holding periods. The momentum profits are computed over different holding periods in 36 months after their formation. The Newey-West (1987) heteroscedasticity and autocorrelation consistent standard errors are used to calculate the *t*-statistics with 4 lags. The sample period is from January 1990 to December 2019.

| Trust Index | Months 1-12 | Months 13-24 | Months 25-36 | Months 13-36 |
|---|---|---|---|---|
| Panel A: The Whole Sample | | | | |
| Low | -0.047 | -0.378 | -0.259 | -0.313 |
| | (-0.45) | (-4.88) | (-2.78) | (-4.95) |
| 2 | 0.245 | -0.415 | -0.145 | -0.280 |
| | (2.15) | (-4.00) | (-1.46) | (-3.79) |
| Medium | 0.299 | -0.096 | -0.019 | -0.064 |
| | (2.35) | (-1.20) | (-0.21) | (-0.98) |
| 4 | 0.498 | -0.276 | -0.268 | -0.278 |
| | (4.33) | (-3.42) | (-3.35) | (-4.93) |
| High | 0.544 | -0.201 | -0.048 | -0.129 |
| | (4.67) | (-2.38) | (-0.75) | (-2.29) |
| High Minus Low | 0.591 | 0.177 | 0.211 | 0.184 |
| | (6.09) | (2.27) | (2.50) | (3.07) |
| Panel B: The Developed Subsample | | | | |
| Low | 0.092 | -0.276 | -0.351 | -0.300 |
| | (0.80) | (-2.68) | (-2.63) | (-3.56) |
| 2 | 0.479 | 0.056 | 0.217 | 0.130 |
| | (4.07) | (0.71) | (2.73) | (2.32) |
| Medium | 0.647 | -0.115 | -0.153 | -0.138 |
| | (4.83) | (-1.40) | (-1.72) | (-2.35) |
| 4 | 0.418 | -0.390 | -0.244 | -0.323 |
| | (3.37) | (-3.86) | (-2.94) | (-4.91) |
| High | 0.850 | -0.021 | 0.117 | 0.044 |
| | (5.21) | (-0.18) | (1.49) | (0.60) |
| High Minus Low | 0.759 | 0.255 | 0.468 | 0.344 |
| | (5.56) | (2.00) | (3.67) | (3.71) |

**Table 1.5 Determinants of Momentum Profits: Fama-MacBeth Regressions**

Monthly market-specific momentum returns (in percentages) are regressed on the trust index and other determinants of momentum profits. Panel A shows the effect of trust on momentum returns after controlling firm characteristics suggested by behavioral momentum models. These control variables are the natural logarithm of trading volume (LnTN), the natural logarithm of stock market volatility (LnV), the volatility of cash flows growth rate (Cfvol), the natural logarithm of median firm size in a stock market (LnSZ), the natural logarithm of book-to-market ratio (LnBM) in a market, the natural logarithm of analyst coverage (LnAna), and the natural logarithm of analyst forecast dispersion (LnDisp). Panel B reports the effect of trust on momentum returns after controlling factors related to financial market development. These factors include the credit-to-GDP ratio (Credit), equity-to-GDP ratio (MCap), average common language dummy variable (Lang), cash flow restrictions (Control), and market openness (Open). Panel C reports the results after controlling for institutional quality. These control variables include insider trading (Insider), the natural logarithm of transaction cost (LnTran), investor protection (Protection), political risk (Political), and the corruption index (Corruption). Panel D shows the results using a comprehensive model, which includes the variables with significant coefficients in the previous three models. The sample periods start from December 1993, January 1991, February 1989, and December 1993 for the four models accordingly and end in December 2019. The Fama-MacBeth regression coefficients are reported in this table. The *t*-statistics are in parentheses and adjusted for heteroscedasticity and autocorrelation using the Newey-West (1987) robust standard errors with 4 lags.

| | Panel A: Behavioral Models | | Panel B: Market Development | | Panel C: Institutional Quality | | Panel D: Comprehensive | |
|---|---|---|---|---|---|---|---|---|
| Intercept | -0.892 | (-1.89) | -0.620 | (-2.56) | -0.951 | (-0.98) | -2.606 | (-3.96) |
| Trust | 1.585 | (4.71) | 1.358 | (2.82) | 1.551 | (3.91) | 1.485 | (3.87) |
| LnTN | -0.164 | (-2.51) | | | | | -0.100 | (-1.68) |
| LnV | -0.590 | (-5.48) | | | | | -0.539 | (-5.20) |
| LnSZ | -0.027 | (-0.90) | | | | | | |
| LnBM | 0.216 | (1.17) | | | | | | |
| Cfvol | -1.084 | (-2.13) | | | | | -0.774 | (-1.60) |
| LnAna | 0.220 | (1.97) | | | | | -0.007 | (-0.15) |
| LnDisp | -0.143 | (-1.62) | | | | | | |
| Credit | | | -0.002 | (-1.11) | | | | |
| Lang | | | 1.038 | (1.28) | | | | |
| Control | | | 0.021 | (0.47) | | | | |
| Open | | | 0.558 | (1.33) | | | | |
| MCap | | | 0.005 | (2.99) | | | 0.003 | (3.17) |
| Insider | | | | | -0.056 | (-0.43) | | |
| LnTran | | | | | -0.196 | (-1.40) | | |
| Protection | | | | | 1.341 | (1.80) | 1.691 | (3.29) |
| Political | | | | | 1.712 | (1.19) | | |
| Corruption | | | | | -0.524 | (-1.10) | | |
| Adjusted $R^2$(%) | 9.92 | | 7.11 | | 7.40 | | 10.72 | |

**Table 1.6 Alternative Trust Measures**

This table reports the estimates of the regression coefficients using the Fama-MacBeth approach. The *t*-statistics are in parentheses and adjusted for heteroscedasticity and autocorrelation using the Newey-West (1987) standard errors with 4 lags. The trust index is based on the percentage of WVS/EVS respondents who have a university or above education level in Panel A, and with above-median income levels in their country in Panel B. The control variables and sample periods are the same as in Table 1.5.

| | Behavioral Models | | Market Development | | Institutional Quality | | Comprehensive | |
|---|---|---|---|---|---|---|---|---|
| Panel A: Education | | | | | | | | |
| Intercept | -1.508 | (-2.82) | -0.404 | (-1.71) | -1.116 | (-1.10) | -2.235 | (-3.86) |
| Trust - HE | 1.436 | (4.67) | 2.104 | (4.84) | 1.765 | (4.18) | 1.160 | (3.79) |
| LnTN | -0.115 | (-2.00) | | | | | -0.091 | (-1.63) |
| LnV | -0.698 | (-5.09) | | | | | -0.666 | (-5.42) |
| LnSZ | -0.056 | (-1.74) | | | | | -0.033 | (-1.21) |
| LnBM | 0.244 | (1.24) | | | | | | |
| Cfvol | -0.922 | (-1.61) | | | | | | |
| LnAna | 0.212 | (1.68) | | | | | 0.076 | (1.48) |
| LnDisp | -0.101 | (-1.05) | | | | | | |
| Credit | | | -0.001 | (-0.34) | | | | |
| Lang | | | 1.465 | (1.65) | | | 1.314 | (2.15) |
| Control | | | -0.034 | (-0.72) | | | | |
| Open | | | 0.319 | (0.68) | | | | |
| MCap | | | 0.002 | (1.18) | | | | |
| Insider | | | | | -0.097 | (-0.63) | | |
| LnTran | | | | | -0.017 | (-0.10) | | |
| Protection | | | | | 0.774 | (1.08) | | |
| Political | | | | | 1.361 | (0.89) | | |
| Corruption | | | | | -0.788 | (-1.66) | 0.796 | (2.30) |
| Adjusted $R^2$(%) | 9.79 | | 5.99 | | 7.11 | | 9.53 | |
| Panel B: Income | | | | | | | | |
| Intercept | -0.932 | (-2.05) | -0.531 | (-2.17) | -1.004 | (-1.01) | -2.532 | (-4.17) |
| Trust - HI | 1.583 | (4.84) | 1.023 | (2.20) | 1.392 | (3.75) | 1.425 | (3.95) |
| LnTN | -0.167 | (-2.67) | | | | | -0.096 | (-1.69) |
| LnV | -0.572 | (-5.41) | | | | | -0.527 | (-5.37) |
| LnSZ | -0.029 | (-0.93) | | | | | | |
| LnBM | 0.236 | (1.27) | | | | | | |
| Cfvol | -1.096 | (-2.16) | | | | | -0.757 | (-1.56) |
| LnAna | 0.198 | (1.74) | | | | | -0.006 | (-0.12) |
| LnDisp | -0.122 | (-1.36) | | | | | | |
| Credit | | | -0.002 | (-1.16) | | | | |
| Lang | | | 0.969 | (1.21) | | | | |
| Control | | | 0.028 | (0.64) | | | | |

Continued

**Table 1.6 (Continued) Alternative Trust Measures**

| | Behavioral Models | Market Development | Institutional Quality | Comprehensive |
|---|---|---|---|---|
| Open | | 0.465 (1.12) | | |
| MCap | | 0.005 (3.20) | | 0.003 (3.12) |
| Insider | | | -0.070 (-0.55) | |
| LnTran | | | -0.170 (-1.21) | |
| Protection | | | 1.245 (1.65) | 1.568 (3.07) |
| Political | | | 1.645 (1.11) | |
| Corruption | | | -0.420 (-0.90) | |
| Adjusted $R^2$(%) | 9.81 | 7.24 | 7.26 | 10.60 |

**Table 1.7 Trust and Uncertainty Avoidance: Dependent Sorting**

This table reports the average monthly momentum returns (in percentages) for market-neutral portfolios classified by Hofstede's uncertainty avoidance index (UAI) and WVS/EVS's trust (Trust) index. For Panel A (B), each month, markets in the sample are first classified into tercile groups based on their UAI (Trust) rankings. The markets in each UAI (Trust) tercile are further ranked and classified into three groups based on their Trust (UAI) rankings. The last row in Panel A (B) reports the average returns from the three UAI (Trust) terciles for each Trust (UAI) group. The last column in Panel A (B) reports the difference between the high and low Trust (UAI) portfolios within each UAI (Trust) group. The sample period in Panel A (B) is from April 1994 (January 1998) to December 2019. The *t*-statistics are reported in parentheses.

| Panel A: Dependent Sorting on UAI and Trust | | | | |
|---|---|---|---|---|
| | Low-Trust | Medium | High-Trust | Diff |
| Low-UAI | 0.617 | 0.647 | 1.152 | 0.535 |
| | (2.92) | (3.38) | (6.67) | (2.91) |
| Medium | 0.180 | 0.552 | 1.057 | 0.877 |
| | (0.93) | (2.41) | (5.92) | (3.32) |
| High-UAI | -0.014 | 0.323 | 0.528 | 0.542 |
| | (-0.08) | (1.51) | (3.18) | (2.24) |
| Average | 0.261 | 0.507 | 0.913 | 0.651 |
| | (2.32) | (4.14) | (9.13) | (5.68) |
| Panel B: Dependent Sorting on Trust and UAI | | | | |
| | Low-UAI | Medium | High-UAI | Diff |
| Low-Trust | 0.027 | 0.217 | -0.010 | -0.038 |
| | (0.12) | (1.17) | (-0.04) | (-0.13) |
| Medium | 0.596 | 1.027 | 0.456 | -0.140 |
| | (3.46) | (4.04) | (2.00) | (-0.66) |
| High-Trust | 0.796 | 1.013 | 1.011 | 0.215 |
| | (4.32) | (4.41) | (5.23) | (1.21) |
| Average | 0.473 | 0.752 | 0.486 | 0.012 |
| | (4.18) | (5.77) | (3.68) | (0.09) |

**Table 1.8 Trust and Individualism: Different Economies**

Panel A (B) reports the average monthly returns (in percentages) of Individualism (Trust) sorted momentum portfolios in developed and developing markets. The IMF classification is used to determine a developed or developing market. The last row in Panel A (B) (High-minus-Low) reports the return difference between the high and low individualism (trust) groups in developed and developing markets. The sample periods in Panel A (B) start from September 1983 (January 1990) for developed markets and March 1994 (March 1995) for developing markets, and end in December 2019. The *t*-statistics are reported in parentheses.

| Panel A: Individualism Effect in Different Economics | | |
|---|---|---|
| Individualism Index | Developed | Non-developed |
| Low | 0.236 | 0.209 |
| | (1.30) | (1.43) |
| 2 | 0.569 | 0.564 |
| | (4.01) | (1.96) |
| Medium | 1.114 | 0.208 |
| | (7.86) | (0.92) |
| 4 | 1.028 | -0.298 |
| | (6.59) | (-1.29) |
| High | 1.082 | 0.402 |
| | (7.57) | (1.71) |
| High Minus Low | 0.846 | 0.193 |
| | (4.54) | (0.79) |
| Panel B: Trust Effect in Different Economies | | |
| Trust Index | Developed | Non-developed |
| Low | 0.158 | -0.007 |
| | (0.84) | (-0.03) |
| 2 | 0.716 | 0.407 |
| | (4.33) | (2.51) |
| Medium | 0.888 | 0.355 |
| | (4.91) | (1.86) |
| 4 | 0.736 | -0.019 |
| | (4.68) | (-0.06) |
| High | 1.235 | 0.178 |
| | (6.54) | (1.06) |
| High Minus Low | 1.077 | 0.184 |
| | (5.58) | (0.83) |

**Table 1.9 Trust and Individualism: Dependent Sorting**

This table reports the average monthly momentum returns (in percentages) for market-neutral portfolios classified by Hofstede's individualism (IDV) index and WVS/EVS's trust (Trust) index. For Panel A (B), each month, markets in the sample are first classified into tercile groups based on their IDV (Trust) rankings. The markets in each IDV (Trust) tercile are further ranked and classified into three groups based on their Trust (IDV) rankings. The last row in Panel A (B) reports the average returns from the three IDV (Trust) terciles for each Trust (IDV) group. The last column in Panel A (B) reports the difference between the high and low Trust (IDV) portfolios within each IDV (Trust) group. The sample periods in both panels are from April 1994 to December 2019. The *t*-statistics are reported in parentheses.

| Panel A: Dependent Sorting on IDV and Trust | | | | |
|---|---|---|---|---|
| | Low-Trust | Medium | High-Trust | Diff |
| Low-IDV | -0.009 | 0.429 | 0.123 | 0.132 |
| | (-0.04) | (2.49) | (0.59) | (0.60) |
| Medium | -0.038 | 0.393 | 0.551 | 0.588 |
| | (-0.21) | (1.99) | (2.98) | (2.83) |
| High-IDV | 1.201 | 1.011 | 1.478 | 0.277 |
| | (5.76) | (5.17) | (7.71) | (1.46) |
| Average | 0.385 | 0.611 | 0.717 | 0.332 |
| | (3.30) | (5.59) | (6.29) | (2.80) |
| Panel B: Dependent Sorting on Trust and IDV | | | | |
| | Low-IDV | Medium | High-IDV | Diff |
| Low-Trust | 0.249 | -0.295 | 0.370 | 0.120 |
| | (1.37) | (-1.25) | (1.94) | (0.59) |
| Medium | 0.286 | 0.477 | 1.132 | 0.846 |
| | (1.08) | (2.94) | (5.48) | (2.77) |
| High-Trust | 0.367 | 1.406 | 1.063 | 0.695 |
| | (2.71) | (6.33) | (5.75) | (4.23) |
| Average | 0.301 | 0.529 | 0.855 | 0.554 |
| | (2.59) | (4.32) | (7.59) | (4.12) |

**Table 1.10 Trust and Individualism: Spanning Tests**

This table reports the results of spanning tests following Novy-Marx (2012). I examine whether the trust effect on momentum, captured by the momentum return difference between the high and low Trust portfolios (High-minus-Low $Trust_{Mom}$), can be explained by the individualism effect on momentum, measured by the momentum return difference between the high and low Individualism portfolios (High-minus-Low $Individualism_{Mom}$) in Panel A, vice versa in Panel B. I conduct the tests in the whole sample and the developed subsample from January 1990 to December 2019. The Fama-French (1993) three factors (MKT, SMB, and HML) are included in the regressions as explanatory variables. The *t*-statistics are in parentheses.

| | The Whole Sample | | The Developed Subsample | |
|---|---|---|---|---|
| Panel A: Dependent variable=High-minus-Low $Trust_{Mom}$ | | | | |
| Intercept | 0.005 | 0.004 | 0.006 | 0.006 |
| | (3.42) | (2.75) | (3.72) | (3.28) |
| High-minus-Low $Individualism_{Mom}$ | 0.336 | 0.337 | 0.496 | 0.497 |
| | (7.75) | (7.63) | (11.02) | (10.99) |
| MKT | | 0.017 | | 0.011 |
| | | (0.53) | | (0.30) |
| SMB | | -0.007 | | -0.025 |
| | | (-0.10) | | (-0.30) |
| HML | | -0.040 | | 0.026 |
| | | (-0.62) | | (0.34) |
| Adjusted $R^2$(%) | 14.13 | 13.57 | 25.13 | 24.57 |
| Panel B: Dependent variable=High-minus-Low $Individualism_{Mom}$ | | | | |
| Intercept | 0.006 | 0.005 | 0.003 | 0.003 |
| | (3.59) | (2.66) | (1.89) | (1.47) |
| High-minus-Low $Trust_{Mom}$ | 0.427 | 0.418 | 0.510 | 0.510 |
| | (7.75) | (7.63) | (11.02) | (10.99) |
| MKT | | -0.092 | | -0.004 |
| | | (-2.67) | | (-0.10) |
| SMB | | -0.086 | | 0.004 |
| | | (-1.13) | | (0.05) |
| HML | | -0.111 | | -0.077 |
| | | (-1.54) | | (-0.99) |
| Adjusted $R^2$(%) | 14.13 | 15.70 | 25.13 | 24.73 |

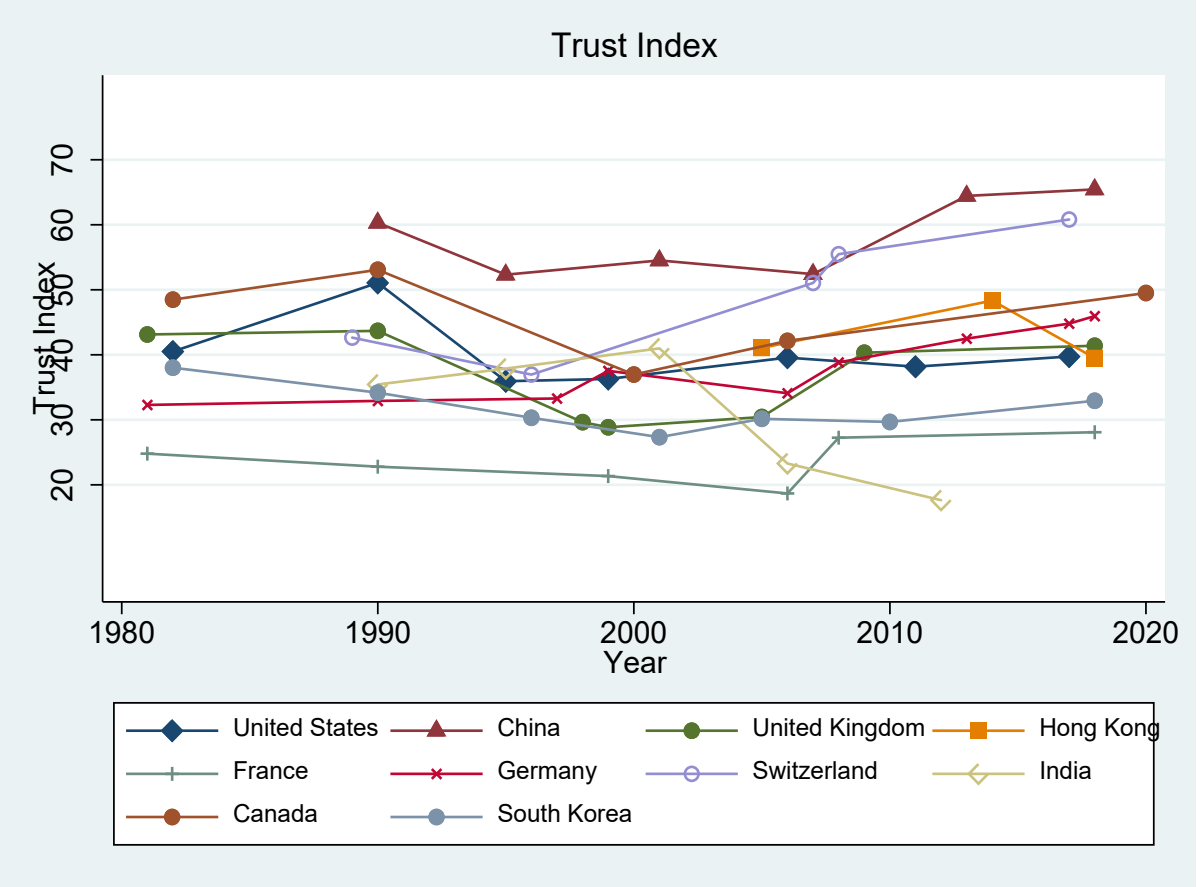
**Table 1.11 Trust, Individualism, and MIX Effects on Momentum Profits**

This table reports the profitability of the momentum trading strategy for market-neutral portfolios sorted by MIX index and its performance relative to the Trust and Individualism (IDV) sorted momentum portfolios. The portfolio formation method is similar to the one in Panel A of Table 1.3. MIX is a variable that captures the information of both Trust and Individualism (IDV). It is calculated as the product of the trust and individualism quintile ranking indexes in each market. Panel A reports the MIX effect on momentum returns. Panel B and Panel D represent the trust and individualism effects on momentum, respectively. Panel C (E) shows the difference between the MIX and Trust (IDV) sorted momentum portfolios. The sample spans from January 1990 to December 2019.

| Index | Winner | Loser | W - L | Winner | Loser | W - L | Winner | Loser | W - L | Winner | Loser | W - L | Winner | Loser | W - L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Panel A: MIX | | | Panel B: Trust | | | Panel C: MIX - Trust | | | Panel D: IDV | | | Panel E: MIX - IDV | | |
| Low | 1.566 | 1.583 | -0.017 | 1.635 | 1.543 | 0.092 | -0.069 | 0.040 | -0.109 | 1.291 | 1.116 | 0.175 | 0.275 | 0.467 | -0.192 |
| | (6.47) | (5.42) | (-0.12) | (6.39) | (5.21) | (0.69) | (-0.68) | (0.33) | (-1.42) | (5.03) | (3.53) | (1.20) | (1.46) | (2.13) | (-1.66) |
| 2 | 1.500 | 0.988 | 0.512 | 1.351 | 0.769 | 0.582 | 0.149 | 0.219 | -0.070 | 1.401 | 1.218 | 0.183 | 0.100 | -0.230 | 0.329 |
| | (5.31) | (3.17) | (3.43) | (5.62) | (2.74) | (3.80) | (0.77) | (1.05) | (-0.58) | (5.33) | (3.71) | (1.09) | (0.51) | (-0.99) | (2.30) |
| Medium | 1.177 | 0.791 | 0.385 | 1.230 | 0.759 | 0.472 | -0.054 | 0.033 | -0.086 | 1.459 | 1.375 | 0.084 | -0.283 | -0.584 | 0.301 |
| | (4.64) | (2.55) | (2.61) | (5.03) | (2.39) | (2.86) | (-0.38) | (0.18) | (-0.72) | (5.22) | (4.27) | (0.56) | (-1.72) | (-3.65) | (3.01) |
| 4 | 1.292 | 0.272 | 1.020 | 1.243 | 0.456 | 0.787 | 0.049 | -0.184 | 0.233 | 1.299 | 0.267 | 1.032 | -0.007 | 0.005 | -0.012 |
| | (5.18) | (0.85) | (6.36) | (5.37) | (1.53) | (5.19) | (0.51) | (-1.53) | (2.86) | (4.96) | (0.82) | (6.37) | (-0.09) | (0.05) | (-0.16) |
| High | 1.568 | 0.416 | 1.152 | 1.417 | 0.541 | 0.877 | 0.150 | -0.125 | 0.275 | 1.479 | 0.401 | 1.078 | 0.089 | 0.015 | 0.074 |
| | (5.80) | (1.29) | (7.35) | (5.58) | (1.81) | (6.48) | (1.19) | (-0.86) | (3.21) | (5.82) | (1.28) | (7.10) | (1.04) | (0.13) | (0.80) |
| High - Low | 0.001 | -1.167 | 1.169 | -0.218 | -1.002 | 0.785 | 0.219 | -0.165 | 0.384 | 0.188 | -0.715 | 0.903 | -0.187 | -0.452 | 0.266 |
| | (0.01) | (-4.65) | (6.71) | (-1.09) | (-4.40) | (5.39) | (1.30) | (-0.83) | (3.42) | (0.83) | (-2.56) | (5.50) | (-0.92) | (-1.87) | (1.79) |

**Figure 1.1 Trust Index in Ten Largest Markets**

The WVS/EVS asks, "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" The trust index is calculated by the percentage of respondents agreeing with the statement "most people can be trusted" in the surveys. For simplicity, the ten markets with the largest market capitalizations are included in the figure.



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# Essay 2. Trade Credit in Distrust: Evidence from Financial Restatements

## 1. Introduction

A financial restatement occurs when financial reports are found to not conform to Generally Accepted Accounting Principles. Financial restatements significantly decrease firms' information credibility and increase stakeholders' perceived information asymmetry. It is widely recognized that suppliers have an information advantage over other stakeholders and are less subject to information asymmetry issues.[25] While extensive literature has shown the economic consequences of financial restatements, there is little research on how suppliers' superior information can affect restating firms and other stakeholders after financial restatements. In this study, by using the occurrence of financial restatements as a proxy for a significant credibility reduction in financial information, I investigate how trade credit can play its role in distrust after financial restatements.

According to the Audit Analytics database, on average, there were more than 750 financial restatements each year from 1995 to 2019. The prevalence of restatements significantly reduces the market's trust in financial information. The lower information credibility and more significant perceived information asymmetry after restatements deter external fund providers, and restating firms have significantly higher costs of external financing (Hribar and Jenkins (2004); Desai, Hogan, and Wilkins (2006); Shi and Zhang (2008); Graham, Li, and Qiu (2008)).

Trade credit is the credit extended to customers by suppliers who let customers buy now and pay later. Suppliers have the liquidation and information advantage in providing credits, and they can extract a higher liquidation value from the inputs collateralized in defaults (Petersen and Rajan (1997); Fabbri and Menichini (2010)). The information acquisition for suppliers is a by-

[25] See, e.g., Smith (1987), Biais and Gollier (1997), Petersen and Rajan (1997), Burkart and Ellingsen (2004), and Fabbri and Menichini (2010).

product of selling (Ferris (1981); Emery (1984); Mian and Smith (1994)), and suppliers can obtain private information about customer firms at a low cost. Because suppliers can get information through private channels and information asymmetry less affects suppliers than other external finance providers, restating firms can rely more on trade credit financing after financial restatements.

According to the previous literature, trade credit contains suppliers' superior information about customer firms' future business and has predictive power for subsequent sales (Petersen and Rajan (1997); Goto, Xiao, and Xu (2015)). However, the informativeness of trade credit about firm sales can change during the restatement periods. Trade credit is determined by factors from the supply side and demand side. The predictability of sales by trade credit comes from suppliers' information about customer firms. Therefore, the informativeness of trade credit for firm sales improves when the information factor from the supply side becomes more important in determining trade credit. After restatements, restating firms are more financially constrained and become more demanding of trade credit. Such change can make demand-side factors less important and supply-side factors more important for trade credit in the post-restatement periods. If the information factor from the supply side can play a more critical role in determining trade credit, then trade credit with a sizeable amount of suppliers' private information can better predict sales. However, suppliers can extend trade credit based on other purposes, such as transaction costs, price discrimination, and relationship building. If such factors from the supply side become more important in trade credit decisions, then those alternative motivations of trade credit provision can blur the positive association between trade credit and firm sales. Therefore, the change in the trade credit informativeness about firm sales can be determined by the change in the importance of the information factor relative to blurring factors during restatement periods.

That is, if the information factor plays a more (less) dominant role than blurring factors, trade credit becomes more (less) informative about firm sales after financial restatements.

Great access to trade credit can positively signal to the market (Biais and Gollier (1997); Aktas et al. (2012); Goto et al. (2015)). Investors in the stock market should pay attention and react to the suppliers' superior information embedded in trade credit. Nonetheless, the credibility of financial information becomes lower after restatements, and the market is dubious about the information from restating firms. Although investors have more accurate information in the post-restatement periods (relative to that in the pre-restatement periods), financial restatements may cause investors to suspect the quality of financial reports and underreact to any financial information, including trade credit information.

In this study, I empirically assess the firms' reliance on trade credit financing, the informativeness of trade credit about firm performance, and the stock market reactions to trade credit information after restatements. For these purposes, I compile 3,357 restatements from 1995 to 2019 in the U.S. market. My empirical evidence suggests that firms rely more on trade credit financing after restatements. I further use the pass of the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) and the percentage of finished goods in inventories to measure suppliers' liquidation advantage (Petersen and Rajan (1997); Ge et al. (2017); Costello (2019)). The empirical results suggest that the tendency to switch to trade credit financing after restatements is not significantly different between observations with more and less liquidation advantage. The increased reliance on trade credit financing for restating firms is thus more likely to be associated with suppliers' advantage in addressing information issues.

I next explore whether trade credit becomes more or less informative about firms' future performance. In the pre-restatement periods, I find that sales monotonically increase for firms with low, medium, and high trade credit. In the post-restatement periods, there is no significant difference in sales between high and medium trade-credit firms. The sales spread between medium and low trade-credit firms becomes significantly larger after restatements. Hence, trade credit becomes less informative on the high end and more informative on the low end. Importantly, when suppliers face risky restating firms, the information effect dominates blurring effects, while when suppliers deal with other (less risky) restating firms, blurring effects dominate the information effect. Therefore, the valuable suppliers' information after restatements is mainly on the negative side (low end). I also find that the results are primarily driven by firms with material restatements; firms with other (non-material) restatements do not experience significant changes in the reliance on trade credit financing and the informativeness of trade credit about firm prospects.

Last, I test how the stock market reacts to trade credit information. I measure the post-announcement-price-drift for high, medium, and low trade-credit firms. The DGTW adjusted returns (Daniel et al. (1997)) are calculated to measure the portfolio performance for holding 1 to 90 trading days after the trade credit information is disclosed to the market. I find significant evidence that investors are unaware of the informativeness change of trade credit and the predictability of stock returns by trade credit is mainly from investors' underreaction to negative trade credit information.

My results are robust after running alternative models, correcting sample selection bias, and using propensity score matching. This study contributes to the literature in the following ways. First, I include trade credit in the restatement literature by showing that trade credit can be

an additional choice for restating firms' external financing after restatements. Second, by showing that the predictability of firm sales by trade credit changes after restatements, this study can advance the trade credit literature by adding further evidence that trade credit's informativeness about customer firm prospects improves when those firms are in financial distress. Third, this study complements the literature by suggesting that suppliers' information advantage can alleviate information asymmetry in the market, while investors do not realize the informativeness change of trade credit and underreact to the negative information from suppliers after financial restatements.

The remainder of the study is organized as below. Section 2 summarizes the prior research and develops hypotheses. Section 3 discusses the data sources and restatement samples. Section 4 reports the empirical results, and Section 5 presents robustness tests. Section 6 concludes.

## 2. Prior Research and Hypothesis Development

This study builds on two research streams: (a) studies that examine the economic consequences of financial restatements and (b) studies that investigate the information content of trade credit. Below I review the related two streams of studies and develop the hypotheses related to the impacts of restatements on firms' trade credit financing, the association between trade credit and firm performance, and the market reactions to trade credit information during the restatement announcement periods.

### 2.1. Economic Consequences of Financial Restatements

Financial restatements are used to correct the inaccurate financial information in the previous statements. Restatements can be caused by the failure of corporate governance and

management reward systems (Agrawal and Chadha (2005); Burns and Kedia (2006); Cheng and Warfield (2005); Efendi, Srivastava, and Swanson (2007)). In some extreme cases, financial restatements are accompanied by the discovery of severe accounting frauds, such as WorldCom and Enron. Therefore, the credibility of firm-released information decreases and investors' perceived information asymmetry increases after financial restatements (Anderson and Yohn (2002); Palmrose, Richardson, and Scholz (2004); Wilson (2008)). Consequently, restatement announcements reduce investors' confidence in firm information substantially and lead to a significant market value drop of related firms.

Financial restatements increase the information risk of restating firms and deliver disquieting information to the market (Kravet and Shevlin (2010)). Extensive literature has documented negative market reactions to this financial event, including the reduced shareholder values for the restating and peer firms (Gleason, Jenkins, and Johnson (2008)), decreased expected future earnings and increased cost of equity capital (Hribar and Jenkins (2004)), and increased interest rates for both bonds and bank loans (Shi and Zhang (2008); Graham, Li, and Qiu (2008)). A restating firm needs to pay higher risk premiums for bonds and stocks after the restatement because restatement announcements reduce investors' perceived accounting quality and increase their perceived risk (Hribar and Jenkins (2004); Shi and Zhang (2008)). Equity and bond investors heavily rely on public disclosure. The fraudulent accounting could deter them from investment significantly. Although bank credit is the most favorable among equity, bond, and bank credit, the significantly increased cost of bank loans can be a heavy burden for many restating firms (Graham, Li, and Qiu (2008)).

While these findings show that restating firms are subject to the increased cost of capital and restatements significantly affect firms' external financing, no study has examined explicitly

whether financial restatements can impact firms' use of trade credit as an external financing choice. Trade credit is important in this discussion for the following reasons. First, trade credit is an essential source of firms' external financing. The use of trade credit in the United States reached a historical maximum of 3.7 trillion dollars in 2017.[26] About 84% of Compustat firms use trade credit, and more than 46% of their external funds are financed through trade credit. Second, as a last resort of financing, trade credit provides insurance against liquidity shocks to restating customer firms. After restatements, trade credit becomes more valuable for financially constricted restating firms.

In summary, prior studies document that financial restatements damage firms' financial information credibility significantly, reduce stock values, increase the investors' perceived information asymmetry and firms' cost of capital, and affect firms' choice of external financing choices. This study extends this stream of research by examining how restatements affect firms' use of trade credit as an external financing choice. The finding of a change in reliance on trade credit financing will add further evidence of the economic consequences of financial restatements.

### 2.2. Market Reactions to the Information Content of Trade Credit

Prior financial literature has discussed the reasons for using trade credit from non-financial and financial perspectives. In non-financial arguments, trade credit is associated with price discrimination (Brennan, Maksimovics, and Zechner (1988)), product quality warrant (Long, Malitz, and Ravid (1993)), building and strengthening long-term supplier and customer relationships (Summers and Wilson (2002); Dass, Kale, and Nanda (2015)), and inventory

[26] The average annual use of trade credit from 2010 to 2019 in the United States is more than 3.2 trillion dollars.

management optimization (Bougheas, Mateut, and Mizen (2009)). The important difference between the non-financial and financial explanations for trade credit use is that the latter explains how information asymmetry can affect the demand and supply of trade credit. In financial theories, Biais and Gollier (1997) suggest that suppliers use private information to screen borrowers and have a lower monitoring cost than banks. Burkart and Ellingsen (2004) agree on suppliers' informational advantage and argue that this advantage is from the input transaction. Fabbri and Menichini (2010) further add the liquidation advantage of suppliers in the trade credit analysis. The empirical evidence from Petersen and Rajan (1997), Ng, Smith, and Smith (1999), and Nilsen (2002) supports those financial theories well.

Most trade credit-related financial literature is built on the lower information asymmetry between supplier and customer firms (compared to other stakeholders). They study how trade credit can transfer private information to other stakeholders extensively. Biais and Gollier (1997) use a signal model and find that trade credit can alleviate credit rationing because of suppliers' monitoring and information advantages. Aktas et al. (2012) find trade credit is positively related to the quality of firms' investments and argue that trade credit can be a channel for managers to commit not to expropriate. Goto et al. (2015) find that trade credit has significant predictive power for firms' future sales prospects and stock returns.

In a nutshell, prior research suggests that suppliers have an information advantage over other stakeholders and more trade credit reveals a positive signal to the market. This study extends this research line by examining how the information content of trade credit can change after financial restatements and how investors react to suppliers' information when the market is in distrust after restatements.

## 2.3. Hypothesis Development

The first hypothesis focuses on whether restatements affect firms' use of trade credit as an external financing choice. Chen, Cheng, and Lo (2013) suggest that restating firms rely more on private debt financing than open market financing because private creditors can better address information problems. Trade credit is often adopted as a substitute when private debt, such as bank credit, is not accessible (Wilner (2000); Nilsen (2002); Fisman and Love (2003)). As the last resort of financing, trade credit can be more accessible than any other choice after restatements. Suppliers have private information advantages compared to other stakeholders. The information acquisition for trade credit is a by-product of selling when sales representatives of suppliers regularly visit the customer firms. Suppliers in the production network are the experts in that field. When customers hold many intangible assets, which other stakeholders cannot or have a significantly high cost to evaluate, suppliers can evaluate customers' intangible assets with low costs and reduce the information asymmetry. Because suppliers can repossess the products from the default customer firms and resell them with favorable prices to other customers, they suffer less loss than other stakeholders when there is a default (Frank and Maksimovic (2005)). Due to the high perceived information asymmetry after restatements, other stakeholders are less willing to provide funds to restating firms. Because suppliers have the information and liquidation advantages over other stakeholders, they can be more willing to extend credit to restating firms. Trade credit can become relatively more important as a source of external financing, and therefore, firms' reliance on trade credit financing increases after financial restatements. The first hypothesis is summarized below:

**H1.** Firms rely more on trade credit financing as an external financing choice after financial restatements.

The second hypothesis examines whether trade credit has a more substantial predictive power for firms' efficiency in generating sales after restatements. As discussed above, suppliers can easily collect and accumulate private information about customer firms through the normal course of business and input transactions. Hence, they can conveniently learn information about customer firms' management and production activities. With this information advantage, suppliers will provide credit to the customer firms when the risk of credit provisions can be compensated with positive cash flows. That is, suppliers are generous with trade credit provisions if their information suggests that customer firms' management and operation are efficient and can contribute to a significant amount of future sales. Biais and Gollier (1997) and Petersen and Rajan (1997) have the consistent finding that suppliers will provide credit to even non-profitable firms and firms neglected by financial institutions as long as those firms have a high potential for future business (higher sales). Therefore, trade credit should contain suppliers' information about customer firms' prospects.

In the pre-restatement periods, restating firm managers use fraudulent accounting to hide problems and mimic good managers (Kedia and Philippon (2009)). Managers can deceive the market to obtain an inappropriate advantage to generate higher sales by purposely releasing favorable but fraudulent information. Suppliers have private information and rely less on public information about customer firms. It is more difficult for restating firm managers to deceive suppliers because of suppliers' information advantage. The inappropriate advantage from fraudulent accounting can blur the association between trade credit and sales. After financial restatements, firms have to adjust their management and operations and are less likely to cheat

the market.[27] In the post-restatement periods, the blurring effect of fraudulent accounting on the association between trade credit and sales becomes weaker and trade credit with suppliers' private information is expected to have more predictive power for sales. This is especially true for problematic firms with limited access to trade credit. The more problematic firms have stronger incentives to use fraudulent information to earn an inappropriate advantage and keep sales to certain levels. Such firm behaviors weaken the association between trade credit and sales in pre-restatement periods and exaggerate the informativeness increase of trade credit over the restatement announcement periods.

A firm's access to the trade credit can be due to customers' (un)willingness to take on more trade credit (the demand side) and suppliers' (un)willingness to extend such credit (the supply side). Fabbri and Klapper (2016) find that customer firms in advantage can ask for more trade credit by exerting bargaining power on their suppliers. This is especially credible when customer firms have many substitute suppliers. After financial restatements, firms tend to have lower bargaining power and may not be able to exert their influence on suppliers for trade credit as before. Because financial restatements significantly increase firms' external financing costs, restating firms are in financial distress and become more demanding for trade credit. Such change can reduce the importance of factors from the demand side for trade credit. Therefore, trade credit can be more determined by factors from the supply side after restatements. Suppliers' information is an essential factor in their trade credit extension decision and can become more critical after restatements. Trade credit is then more likely to be extended to customer firms with significant potential for sales in the post-restatement periods.

[27] This is true for the short term. In the long run, I do observe that restating firms have subsequent and multiple restatements.

Nini, Smith, and Sufi (2012) find that creditors can play an active role in corporate governance after violations of financial covenants. They find that firms have better operating and stock price performance in the post-violation periods because creditors obtain control rights through amendments to credit agreements, and they put strong restrictions on firm decision-making. Petersen and Rajan (1997) argue that suppliers can have an advantage in controlling customer firms. They indicate that customer firms may have "few economic alternative sources other than the supplier" due to the nature of the goods being supplied. So, suppliers' threat to cut off future supplies can increase their control rights significantly. Petersen and Rajan (1997) further suggest that suppliers' advantage in controlling buyers may be more significant than other creditors because the threat to withdraw future finance may not affect borrowers' current operations immediately, while the threat to cut off future supplies can. Suppliers can play a similar or even more positive role in the governance of corporations as creditors do in Nini, Smith, and Sufi (2012). The suppliers' control rights can restrict restating customer firms' over-investment and over-employment as discussed in Kedia and Philippon (2009) and improve violating firms' performance as in Nini, Smith, and Sufi (2012). Moreover, the marginal value of trade credit increases after restatements because of financial constraints. Therefore, additional trade credit can be more advantageous for firm performance (higher sales) in the post-restatement periods, if all else equal.

To sum it up, suppliers' information becomes a more important factor in the function of trade credit after restatements. Therefore, trade credit is less likely to be extended to risky restating firms with limited future sales. In addition, trade credit (suppliers) can also play corporate governance and assistor roles, enabling firms with more trade credit to generate more sales in the post-restatement periods. The second hypothesis is as below:

**H2a.** Trade credit becomes more informative about firm sales after financial restatements.

Although factors from the supply side can become more important in determining trade credit after financial restatements, suppliers' information is just one factor among many others. How the informativeness of trade credit would change after restatements still depends on the dominance of suppliers' other motivations for trade credit provision to the information factor. Suppliers can provide trade credit for other purposes, such as warranty for product quality, price discrimination, transaction costs, and relationship building. The effects on trade credit extension because of quality warranty are symmetrical before and after restatements. Thus, it should not change suppliers' decisions on trade credit provision during the restatement periods. Suppliers have a strong incentive to make additional sales without reducing the price to existing customers (Petersen and Rajan (1997)). Also, suppliers are interested in reducing the seasonal volatility of sales to reduce the inventory cost and the cost of financing it. Trade credit can be extended based on such purposes and directed to risky and problematic customer firms (restating firms), because good customer firms may find trade credit costly and repay it with the least delay possible, while risky and problematic customer firms may value trade credit because they do not have alternatives (Nilsen (2002)). After restatements, firms become more financially constrained, and they can receive trade credit more likely due to suppliers' other non-informational purposes for trade credit extension. Suppliers also have a strong interest in the survival of customer firms and building long-term supplier-customer relationships for future business. This is especially true when suppliers have a limited number of customers or have no potential substitutes for their customers. Suppliers' intentions of more sales, lower transaction costs, and relationship building can make them extend trade credit to risky and problematic firms (restating firms) and reduce the

weight of information in suppliers' decisions to extend trade credit, which can blur the relationship between trade credit and sales.

**H2b**. Trade credit becomes less informative about firm sales after financial restatements.

The last hypothesis examines how investors in distrust react to the suppliers' information embedded in trade credit after restatements. After restatements, trade credit may serve as a signal to the market for reasons as follows: (1) suppliers exclude potentially problematic customer firms for credit provision based on their private information (the information role); (2) suppliers play an external corporate governance role in improving firm performance (the corporate governance role); (3) trade credit can be an important assistor for the recovery of restating firms (the assistor role). If the stock market is aware of the valuable trade credit information, investors should react to it as soon as possible.

**H3a**. Investors react to suppliers' information embedded in trade credit promptly after financial restatements.

On the other hand, the significant trust reduction caused by restatements should not be underestimated. Investors may distrust all financial information of restating firms, including the trade credit information provided by managers. Therefore, investors may underreact to the suppliers' information in trade credit because they "overreact" to the financial event of restatements. Also, investors may not be able to distinguish the suppliers' valuable information among various other purposes for trade credit provision. The alternative motivations for trade credit may blur the signal of suppliers' information. This is especially true when investors are in distrust and information signals malfunction after financial restatements.

**H3b**. Investors in distrust underreact to the suppliers' information in trade credit after financial restatements.

## 3. Data and Sample

I obtain accounting data from Compustat and get stock return data from CRSP. Restatement data is from the Audit Analytics database, containing the restatements announced from 1995 to 2019.[28] Among about 20,000 restatements, some are more material and are related to intentional misreporting, while others are less severe and are immaterial restatements. The market may have different reactions to material restatements and other restatements. For this reason, I first investigate how trade credit can play a role in distrust by using the entire restatement sample. Then I separately examine the subsets of restatements that I refer to as material restatements (related to "irregularities" per Hennes et al. (2008)) and other non-material restatements.[29] It is reasonable to expect that material restatements would reduce the trust levels of investors more significantly. Therefore, my empirical results are expected to be more pronounced in the tests using a sample of material restatements.

[Insert Table 2.1]

Table 2.1 Panel A shows the process of sample selection. The Audit Analytics sample contains 18,164 restatements from 1995 to 2019. I exclude 7,896 restatements because of multiple restatements from the same firms and drop 5,823 restatements because of the lack of

[28] As indicated by Scholz (2008), the Audit Analytics database includes almost all the restatement cases in the GAO database and through Lexis-Nexis searches. It provides a more extensive sample than the GAO database. See Karpoff et al. (2017) to review different measures and databases for financial restatement studies. My results still hold by using the GAO database.

[29] Similar to Badertscher et al. (2011), Rice and Weber (2012) and Omer, Shelley, and Tice (2020), I identify material restatements if the related ones are noted in Audit Analytics with one of the following attributes: (1) fraud, (2) SEC investigation, and (3) board involvement.

Compustat or CRSP data.[30] I lose 1,088 firms after excluding the restatements in the financial (SICs 6000-6999) and utilities industries (SICs 4900-4999). My primary sample is composed of 3,357 restatements, including 1,115 material restatements and 2,242 other restatements.

Table 2.1 Panel B shows the descriptive statistics of sample firms' financial statistics in the restatement year. On average, restating firms have total assets of $3.1 billion (the average size is 5.6, where size is the natural log of total assets), and more than half of the restating firms are profitable with a median return on assets of 8%. Compared to other restating firms, material restating firms have less leverage, more sales and employees, and more negative stock returns in the restatement announcement years.

## 4. Empirical Results

### 4.1 Change in Trade Credit Financing after Financial Restatements

To examine how trade credit financing changes after restatements, I compare the proportion of trade credit to total borrowing (and total external financing) three fiscal years before ($y$-3, $y$-2, and $y$-1) and after restatements ($y$+1, $y$+2, and $y$+3).[31]

#### 4.1.1 Results Based on Benchmark-Adjusted Analysis

Following Kedia and Philippon (2009), I create a control group of non-restating firms that match age, size, and industry characteristics. Specifically, I select all non-restating firms that have a similar Compustat age with the restating firm. I then keep the non-restating firms in a similar industry (defined as the Fama-French 48 industry classification) and a similar initial total asset quintile. Financial and utilities firms are excluded. I use the average value of the control

[30] I only keep the first restatement if a firm has multiple restatements to avoid the contamination effect.

[31] My results still hold when the comparison periods extend to five fiscal years before and after restatements. They are available upon request.

group as the benchmark for each restating firm and adjust the variable of interest by subtracting the average value of the control groups.

$$\hat{g}_{iy} = g_{iy} - \bar{g}_{C(i)y}, \tag{1}$$

where $C(i)$ is the control group for firm *i*.

To investigate whether firms rely more on trade credit financing after restatements, I run the following regression:

$$\widehat{TC\ Financing}_{iy} = \beta^{before} 1_{\tau(i)-3 \le y < \tau(i)} + \beta^{during} 1_{y \in \tau(i)} + \beta^{after} 1_{\tau(i) < y \le \tau(i)+3} + \varepsilon_{iy}, \tag{2}$$

where $\widehat{TC\ Financing}_{iy}$ is restating firms' excess trade credit financing (compared to that of the control firms matched by age, size, and industry), and $\tau(i)$ is the restating period for firm *i*.

The estimated coefficients on $\beta^{before}$, $\beta^{during}$, and $\beta^{after}$ indicate whether restating firms rely more on trade credit financing than comparable firms before, during, and after the restatement year. The null hypothesis in those estimations is $\beta = 0$. I then compare $\beta s$ over time to examine whether trade credit financing reliance changes significantly around the announcement periods. The null hypothesis is then $\beta^{before} = \beta^{after}$.

[Insert Table 2.2]

Table 2.2 reports the adjusted dynamics of trade credit financing around the announcement periods using the whole restatement sample (columns (1) and (4)), the material restatement subsample (columns (2) and (5)), and the other restatement subsample (columns (3) and (6)). $\beta^{before}$ is significantly negative for the whole restatement sample in column (4), which suggests that most restating firms rely less on trade credit financing (compared to control firms)

in the pre-restatement periods. For material restating firms, the coefficients on $\beta^{before}$, $\beta^{during}$, and $\beta^{after}$ show monotonically increasing trends, indicating that material restating firms use more trade credit as a borrowing and external financing choice over time during the restatement periods. The null hypothesis that $\beta^{before} = \beta^{after}$ can be rejected at a significant level only for the material restating sample. This finding is consistent with H1 that restating firms rely more on trade credit financing when financial restatements materially reduce stakeholders' trust.

I then examine other possible determinants for the restating firms' trade credit financing choice. To do so, I regress the adjusted trade credit financing ratios on the Post indicator and other potential determinants:

$$\widehat{TC\ Financing}_{iy} = \alpha + \beta_3 Post_{iy} + \gamma Controls_{i,y-1} + \varepsilon_{iy}, \quad (3)$$

where $\widehat{TC\ Financing}_{iy}$ is the adjusted reliance on trade credit financing, and $Post_{iy}$ is the indictor for the post-restatement period. The regression coefficient $\beta_3$ captures the incremental change in trade credit financing for restating firms.

Following prior literature (Hadlock and James (2002); Rauh and Sufi (2008); Chen, Cheng, and Lo (2013)), I control for a series of firm characteristics, including firm size (Size), the natural logarithm of the M/B ratio (LnMB), prior returns (Stock return), cash and short-term investments (Cash), return on assets (ROA), book leverage (Leverage), over-investment and over-hiring measures (PP&E growth and Employees growth), and the tax effect on financing choices (Marginal tax rate). All control variables are measured at the start of the year of interest.

[Insert Table 2.3]

Table 2.3 presents the results of testing H1 using multivariate regressions. The coefficients on Post capture the restating firms' tendency to switch to trade credit financing. Consistent with the finding in the test of $\beta^{before} = \beta^{after}$, material restating firms significantly rely more on trade credit financing after restatement announcements. The relative use of trade credit financing increases by about five percentage points for material restating firms, significantly different from zero at less than one percent level. Firms with other restatements experience less significant increases in the relative use of trade credit financing. While the use of trade credit in external financing is significantly different from zero for other restating firms, the magnitude of the increase is about half of that for material restating firms (2.5 percentage points compared to 5.1 percentage points). The relative use of trade credit to total borrowing for other restating firms is not significantly different from that of control firms.

For the control variables, I find that smaller firms, firms with less leverage, more cash, worse prior stock market performance, lower PP&E and employees growth rate, and firms with higher marginal tax rates are more likely to rely on trade credit financing.

In summary, the results reported above support H1—firms rely more on trade credit financing after restatement announcements.[32] Material restating firms drive the increase, and firms with other restatements experience a less significant or insignificant change in trade credit financing. The results are consistent with Petersen and Rajan (1997) and Nilsen (2002) that firms rely more on trade credit financing when they do not have alternatives.

[32] I run the baseline regression with both industry and year-fixed effects. As a robust test, I interact fixed effects between industry and year and continue to find significant positive coefficients on Post for material restating firms, 0.057 (*t*-statistic=3.85) and 0.052 (*t*-statistic=4.26), for the trade credit financing ratios adjusted by total borrowing and total external financing accordingly.

### 4.1.2 Information Advantage and Liquidation Advantage

As discussed above, suppliers can provide trade credit to restating customer firms for two possible reasons. On the one hand, suppliers are still willing to extend credits to customer firms after restatements because their private information suggests that customers are (potentially) good firms. On the other hand, suppliers are still supportive (relative to other stakeholders) because they have a liquidation advantage and can repossess and resell their goods to other buyers (Petersen and Rajan (1997); Fabbri and Menichini (2010)). The information advantage- and liquidation advantage-based explanations have different economic consequences. The information advantage-based explanation suggests that the trade credit extension from suppliers is a positive signal to the market, and other stakeholders can adjust their behavior according to suppliers' attitudes to restating firms (Biais and Gollier (1997)). The liquidation advantage-based explanation indicates that suppliers may extend credits to firms with severe issues as long as the liquidation costs are low.

This section examines whether the tendency to use more trade credit financing after restatements is related to suppliers' information advantage, liquidation advantage, or both. I use the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) as an exogenous shock for suppliers' liquidation advantage in the first test. The pass of BAPCPA dramatically improves suppliers' ability to liquidate the goods of bankrupt customers (Ge et al. (2017); Costello (2019)). I predict that the tendency to use more trade credit financing after restatements in the post-BAPCPA should be more pronounced if the liquidation advantage is the dominant effect. In the second test, following Petersen & Rajan (1997) and Chod et al. (2019), I use the percentage of finished goods in inventories as a proxy for the suppliers' advantage in liquidation. I predict that restating firms with a higher proportion of finished goods in inventories should

have a less significant tendency to use trade credit financing after restatements if suppliers' liquidation advantage is the primary reason for the results. Because I find that firms with material restatements experience a significant change in trade credit financing, I focus on firms with material restatements in the tests. To examine the effects of suppliers' information and liquidation advantages on trade credit financing after restatements, I run regressions using model (3) for the periods before versus after the BAPCPA pass and for firms with high versus low finished goods/inventories (INVFG/ INVT) ratio.[33]

[Insert Table 2.4]

Table 2.4 Panel A (B) reports the results from using BAPCPA (INVFG/ INVT) as a proxy for suppliers' liquidation advantage. In both pre-BAPCPA and post-BAPCPA periods, the tendency to switch to trade credit financing after material restatements is highly significant, while the coefficient on Post is larger in magnitude in the pre-BAPCPA periods. Both high and low finished goods/inventories ratio firms rely more on trade credit financing after material restatements, while firms with higher finished goods/inventories ratios have more significant results. I do not observe that firms with more liquidation advantage (lower finished goods/inventories ratio) have a significantly stronger tendency to switch to trade credit financing after material restatements. This evidence suggests that firms' high proportion of trade credit financing after material restatements is more likely associated with suppliers' information advantage rather than liquidation advantage.

[33] A firm's finished goods to inventories ratio is considered as high if its ratio is higher than the average value of control firms with similar characteristics of age, size, and industry, low otherwise.

### 4.2 Trade credit and firm sales after financial restatements

This section examines whether trade credit becomes more informative about firm sales during financial restatement periods. That is, I want to know whether the information effect dominates the blurring effect or not after restatements. To investigate whether trade credit can predict subsequent sales after controlling for the known predictors, I employ the following multivariate regressions for restating firms:

$$Sales_{iy} = \alpha + \beta_{41} High_{iy-1} + \beta_{42} Low_{\ iy-1} + \beta_{43} Post_{iy} + \beta_{44} High_{\ iy-1} \times Post_{iy} + \beta_{45} Low_{\ iy-1} \times Post_{iy} + \gamma Controls_{iy-1} + \varepsilon_{iy}, \quad (4)$$

where $Sales_{iy}$ is measured by sales adjusted by total assets. $Post_{iy}$ is an indicator for the post-restatement period. $High_{iy-1}$ and $Low_{\ iy-1}$ are indicators for firms with top and bottom tercile access to trade credit among sample restating firms. These restating firms are sorted and grouped into high, medium, and low portfolios each year based on their benchmark-adjusted access to trade credit. The tercile trade-credit portfolios are constructed separately for the whole restatement sample, the material restatement sample, and the other restatement sample.

Control variables are measured at the beginning of the fiscal year and include size, ROA, the natural logarithm of market-to-book ratio, accruals, stock returns, PP&E growth rate, and employees growth rate. I also control for the industry- and year-fixed effects. *T*-statistics are calculated based on standard errors adjusted for the firm- and year-level clustering. In the regression, the coefficient $\beta_{41}$ ($\beta_{42}$) measures the difference in the predictive power of sales by trade credit between firms with high (low) trade credit and firms with medium trade credit in the pre-restatement periods. The coefficient $\beta_{44}$ ($\beta_{45}$) captures whether the change in the

predictability of sales by trade credit over the restatement announcement periods is significant for firms with high (low) trade credit (with the benchmark of medium trade-credit firms).

[Insert Table 2.5]

Table 2.5 summarizes the regression results for the predictability of sales by trade credit before and after restatement announcements. As reported in columns (1) and (4), compared to firms with medium trade credit, firms with high (low) trade credit have significantly more (less) sales in the pre-restatement periods. Columns (2), (5), and (8) show that low trade-credit firms have significantly fewer subsequent sales (relative to medium trade-credit firms) after restatements. For material restating firms with low trade credit, the economic and statistical significance of the predictive power of sales by trade credit (relative to medium trade-credit firms) is almost twice as large as that in the pre-restatement periods. The predictability of sales by trade credit is no longer significantly different between high and medium trade-credit firms after material restatements. After adding the interaction terms High×Post and Low×Post into the regressions, I find that the coefficients on the two interaction terms are statistically significant for the material restatements sample, suggesting that low (high) trade credit becomes more (less) informative about firm sales after material restatements. This result is consistent with the explanation that suppliers' other purposes of trade credit provision blur the association between trade credit and firm sales for high trade credit firms, while for low trade-credit firms, the blurring effect fades away and the information effect dominates in the post-restatement periods. Intuitively, there are two ways to understand this result. On the one hand, suppliers are willing to provide trade credit to material restating firms for non-informational purposes, such as price discrimination, transaction costs, and relationship building, only when they believe restating customer firms are non-bad firms. If suppliers' information suggests that such trade credit

extension is too risky, they will not hesitate to cut the trade credit extended to customer firms. On the other hand, the inability to access trade credit (as the last resort of financing) after material restatements should deliver a more negative signal than in the pre-restatement periods. Overall, my results also suggest that the corporate governance or assistor role of trade credit after material restatements are less likely to explain the results in Table 2.5 because I should otherwise have observed that trade credit becomes more informative about firm sales for the high trade credit firms. The information role of trade credit is more pronounced for low trade-credit firms after material restatements. I do not observe a significant change in the informativeness of trade credit for sales over the announcement periods for other non-material restatements.

As to the control variables, I find that previously profitable restating firms continue to perform well and have higher sales. Firms with higher accruals tend to have lower subsequent sales. This is consistent with the fact that firms may recognize sales earlier to increase receivables and earnings. The prematurely recognized sales increase accruals in the current year but reduce sales in the future year (Goto et al. (2015)). In addition, prior stock returns are positively related to subsequent sales for material restating firms. I find that large restating firms do not efficiently generate sales. I also observe that restating firms with overinvestment issues experience low subsequent sales.

### 4.3 Market reactions to trade credit in distrust after financial restatements

The empirical evidence in this study supports that suppliers have the information advantage and the trade credit informativeness changes after financial restatements. The next question that needs to answer is how the stock market reacts to the trade credit information after restatements.

The information asymmetry between restating firms and suppliers is much less severe than that for other stakeholders. Suppliers decide on credit provisions based on private information rather than public information. Therefore, restating firms having greater access to trade credit can be a positive signal to the stock market. This section examines whether investors are aware of and react to the suppliers' information embedded in trade credit quickly and sufficiently. If investors process and incorporate trade credit information in a timely manner, I expect this information to be incorporated on the date when it is available. More importantly, it would cause less (if any) price drift on the subsequent days. Alternatively, if investors do not recognize and respond to the trade credit information after restatements, it might cause (exacerbate) the price drift over subsequent periods.

I use restating firms' last earnings report date each year to capture the first time for the market to obtain firms' annual trade credit information. If the earnings report date is not available, I use their file date instead. I create High, Medium, and Low trade-credit portfolios as before. I calculate the cumulative returns for restating firms from the subsequent 1 to 90 trading days in the post-restatement periods for each trade credit portfolio. Then I compute the return premiums among the top tercile portfolio (High), the middle tercile portfolio (Medium), and the bottom tercile portfolio (Low). To alleviate the concerns that the portfolio performance is associated with the firm characteristics of size, book-to-market ratio, and prior performance, I follow Daniel et al. (1997) to construct the DGTW adjusted returns. By construction, the DGTW-adjusted returns are neutral to the return variations ascribed to size, book-to-market ratio, and prior stock performance.

[Insert Table 2.6]

Table 2.6 reports DGTW-adjusted returns for the High trade-credit firms, Medium trade-credit firms, Low trade-credit firms, and the return premium between the High, Medium, and Low firms. Panel A and Panel B show the results for material restatements and other restatements, respectively.[34] In Panel A, I find an increasing pattern for the returns of the Medium trade-credit portfolio from day *t*+1 to day *t*+50, when the trade credit information is available on day *t*. After 60 trading days, the trade credit information no longer has predictive power for returns. Recall that the trade credit informativeness for High and Medium trade-credit firms in Table 2.5 changes after material restatements. If investors get used to the notion that High trade credit contains more positive information than Medium trade credit before material restatements and are not aware that High and Medium trade credit indicate an equivalent level of positive information after material restatements as shown in Columns 4 and 5 of Table 2.5, then they may underreact to the positive information included in Medium trade credit given that they promptly react to the information in High trade credit. I have a similar finding for other restatements in Panel B. There is a weak pattern for investors' underreaction to the negative information in Medium trade credit after other restatements. Columns 7 and 8 in Table 2.5 show that Medium trade-credit firms have slightly fewer sales than High trade-credit firms in the post-restatement periods compared to in the pre-restatement periods. Again, suppose investors get used to High and Medium trade credit information content before other restatements and are unaware of the minor change that Medium trade credit contains less favorable information than High trade credit after restatements. In that case, investors may underreact to the negative information in the Medium trade credit, as suggested in Panel B Table 2.6. Further, the absolute

[34] For the sake of brevity, I do not report the cumulative returns from *t*+6 to *t*+9 in Table 2.6. The return patterns from *t*+6 to *t*+9 are consistent with those from day *t*+1 to day *t*+5. These results are available upon request.

value of cumulative returns for Medium trade-credit firms in Panel A is much larger than that in Panel B (3.2% versus 0.5%). Such difference suggests that the underreaction to the positive information in Medium trade credit after material restatements is more significant than the underreaction to the negative information in Medium trade credit after other restatements, which echoes the more significant informativeness change for High and Medium trade credit after material restatements than that after other restatements as in Table 2.5.

Importantly, I find that investors do not quickly react to the negative trade credit information after material restatements. The cumulative returns for Low trade-credit firms are not economically and statistically significant until after 60 trading days in Panel A. Most positive information in Medium trade credit is incorporated into stock prices only after 40 trading days. Interestingly, the results in Panel B suggest that investors incorporate most negative information in Low (Medium) trade credit in 20 (10) trading days. Moreover, the economic magnitudes of the overall cumulative returns for material restating firms are much larger than those for other non-material restating firms. The differences in reaction time and return magnitudes between material and other restatements suggest that material restatements affect the market more significantly. Investors distrust and thus delay their reactions to firm information when restatements materially damage the creditability of restating firms and their managers.

After comparing returns between High, Medium, and Low trade-credit firms, I find that the predictability of returns by trade credit mainly comes from investors' underreaction to the information in Low trade credit. While many factors can affect the information incorporation and thus the subsequent returns, I further run the following regressions to examine the predictability of stock returns by trade credit after controlling for other potential factors that can affect information incorporation:

$$DGTWRet_{i,t+1\leq\tau(i)\leq t+90} = \alpha + \beta_{51} High_{iy} + \beta_{52} Low_{iy} + \gamma Controls_{it} + \varepsilon_{it}, \quad (5)$$

The dependent variables are DGTW-adjusted cumulative returns for the subsequent corresponding trading days from *t*+1 to *t*+90, and *t* is the date the stock market becomes aware of the new trade credit information, measured by the report date of last quarter's earnings or file date if the earnings report date is unavailable. $Controls_{it}$ represents the information of control variables for firm *i* available at time *t*. The key independent variable is High and Low, which is the indicator for stocks with high and low access to trade credit. The coefficients on High (Low) capture the return spread between High (Low) and Medium trade-credit stocks after controlling other factors. The comprehensive set of control variables includes abnormal trading volume (AVol), the ratio of the difference of the stock's daily high and low price to the daily high price (HLtoH), the cumulative return from days *t*-25 to *t*-5 (CumRet), stock's average turnover from day *t*-25 to day *t*-5 (Turnover), the relative bid-ask spread (Spread), the standard deviation of daily returns from *t*-25 to *t*-5 (SDRet), the natural logarithm of the average market value of the stock from *t*-25 to *t*-5 (LnMV), the log of book-to-market ratio (LnBM), the log of the number of analysts plus one (LnNumEst) and the log of the dispersion of analyst forecasts (LnDisp). Regression results in Table 2.7 confirm my previous findings in Table 2.6 that investors underreact to the negative trade credit information and there is a more significant reaction delay if restatements more materially affect investors' confidence in firm information.[35]

[Insert Table 2.7]

Overall, my empirical evidence suggests that material restatements significantly reduce the market's trust in firm information and cause long delays for the stock market to incorporate

[35] The results for control variables are not reported in Table 2.7 to save space and are available upon request.

trade credit information into stock prices. Investors are unaware of the informativeness change of trade credit after financial restatements and have minor underreactions to the non-extreme trade credit information. Notably, the stock market underreacts to the negative trade credit information, which is the most important signal from the suppliers.

## 5. Robustness Tests

### 5.1 Controlling for Selection Bias with Heckman Two-Step Procedure

In this section, I implement a selection model to mitigate the influence of sample selection bias. To measure trade credit financing, I require a sample firm to have external financing data. Firms that do not have external financing are excluded from my sample. In other words, my analysis is based on a subsample of observations in the previous tables. Whether to finance externally is not a random decision. To mitigate the potential selection bias concern, I use Heckman's (1979) selection model. In the first stage, I run a probit model on the entire sample to predict whether a firm would be included in the analysis sample. The dependent variables, D_TB and D_TEF, equal one for observations that are included in the analysis sample, zero otherwise. In the second stage, I add the Inverse Mills' ratio generated from the first step to the baseline regression. In Table 2.8, columns (1) and (3) report the first-stage results. The second-stage results in columns (2) and (4) show that the coefficients on Post are still significantly positive. My results are therefore robust after controlling for the potential sample selection bias.

[Insert Table 2.8]

**5.2 Results Based on Propensity Score-Matched Sample Analysis**

This section uses the propensity score matching approach to construct a matched sample for material restating firms and replicate my main findings with the matched sample. Specifically, I run a probit regression using the indicator of material restating firms as the dependent variable. The independent variables include the average values of firm size, market-to-book ratio (Ln), stock returns, and leverage in the pre-restatement periods. All non-restating firms (utility and financial firms are excluded) in the sample period are the candidates for the matched control firms. I run this regression by industry-year, and the industry is defined as the Fama-French 48 industry classification. Based on this regression, a material restating firm in the sample period is matched with one non-restating firm in the same industry and year.

To evaluate the matching performance, I first compare the average values of firm characteristics between material restating firms and matched control firms. As reported in Panel A Table 2.9, the average differences between the two groups are statistically insignificant except for the leverage and accruals, suggesting that the matching procedure performs well. I run the following regressions with the matched samples to reexamine the first and second hypotheses. Following Cram et al. (2009) and Chen, Cheng, and Lo (2013), I include matched pair dummies and industry-fixed effects in the regressions.

$$\widehat{TC\ Financing}_{iy} = \alpha + \beta_{61} Material_i + \beta_{62} Post_{iy} + \beta_{63} Material_i \times Post_{iy} + \gamma Controls_{iy-1} + \varepsilon_{iy}, \quad (6)$$

$$Sales_{iy} = \alpha + \beta_{71} Material_i + \beta_{72} High_{iy-1} + \beta_{73} Low_{iy-1} + \beta_{74} Post_{iy} + \beta_{75} Material_i \times High_{iy-1} + \beta_{76} Material_i \times Low_{iy-1} + \beta_{77} Material_i \times Post_{iy} +$$

$$\beta_{78}High_{iy-1} \times Post_{iy} + \beta_{79}Low_{iy-1} \times Post_{iy} + \beta_{710}Material_i \times High_{iy-1} \times Post_{iy} +$$

$$\beta_{711}Material_i \times Low_{iy-1} \times Post_{iy} + \gamma Controls_{iy-1} + \varepsilon_{iy}, \quad (7)$$

where $Material_i$ is the indicator for material restating firms. All other key independent variables are defined similarly to models (3) and (4).

[Insert Table 2.9]

Coefficients of $\beta_{63}$ in the model (6) and $\beta_{710}$ and $\beta_{711}$ in model (7) capture the incremental change for material restating firms. Panel B and Panel C in Table 2.9 report the reexamination results for Table 2.3 and Table 2.5. I still find that firms rely more on trade credit financing and the informativeness of trade credit about firm sales changes after financial restatements when using propensity score matching.

**6. Conclusion**

This study investigates how trade credit can play an active role in distrust after financial restatements. I focus on the restatement setting because restatements are associated with significant decreases in trust and significant increases in perceived information asymmetry. By linking trade credit to financial restatements, I am able to examine how suppliers' superior information can affect restating firms' external financing choices, whether the informativeness of trade credit changes, and how the stock market reacts to trade credit information after financial restatements.

My sample includes 3,357 restatements announced during the period of 1995-2019, among which 1,115 are material restatements and 2,242 are other restatements. I compare the change in trade credit financing from the pre- to post-restatement periods and find that firms rely more on trade credit as an external financing choice after restatements. Further evidence

indicates that as a proxy for more significant trust reduction, material restatements are associated with a greater tendency to switch to trade credit financing after restatements. After comparing the predictability of firm sales by trade credit in the pre- and post-restatement periods, I find that the trade credit informativeness about firms' prospects changes during the restatement periods. Trade credit becomes less informative on the high end and more informative on the low end after material restatements. The most important signal from suppliers to other stakeholders is on the negative end. I further find that investors in the stock market do not realize the informativeness change of trade credit and underreact to the negative information in the trade credit, which leads to a significant predictive power of trade credit for the subsequent stock returns.

The findings in this study have important implications for what stakeholders can do after financial restatements when their perceived information asymmetry increases. Because of suppliers' information advantage, following suppliers' signals seems to be a reasonable solution. However, my empirical evidence suggests that financial restatements can also change suppliers' behaviors and cause their signals on the high end to malfunction. Only the negative information from the suppliers is sufficiently informative. Other stakeholders, such as stock market investors, are unaware of the effect of financial restatements on suppliers and overlook the most important negative signal from the suppliers.

## Appendix

### Variable Definitions

| Variables of trade credit | |
|---|---|
| Trade credit financing | |
| Trade credit/total borrowing | Accounts payable/(long-term debt + debt in current liabilities + accounts payable) |
| Trade credit/total external financing | Average accounts payable/(proceeds from the sale of common and preferred stock and the issuance of long-term debt + average short-term borrowings and average accounts payable) |
| Access to trade credit | Accounts payable adjusted by total assets |
| Control Variables related to firm financing and sales | |
| Firm size | The natural log of total assets |
| Cash | Cash and short-term investments adjusted by total assets |
| ROA | Operating income before depreciation/total assets |
| Leverage | Short- and long-term debt to total assets |
| Stock return | Stock returns in the fiscal year |
| M/B | The market value of assets/book value of assets |
| Marginal tax rate | Simulated marginal tax rate provided by John Graham. If missing, I calculate an estimated value according to Graham and Mills (2008) |
| Accruals | Income before extraordinary items minus (net cash flow minus extraordinary items and discontinued operations) and then divided by total assets |
| PP&E growth | The growth rate of net property, plant, and equipment |
| Employees growth | The growth rate of the number of employees |
| Control variables related to stock returns | |
| Avol | A stock's daily trading volume/the previous 252-day average volume |
| HLtoH | The difference between a stock's daily high and low price adjusted by its daily high price |
| CumRet | The cumulative return from day *t*-25 to day *t*-5 |
| Turnover | A stock's average turnover from day *t*-25 to day *t*-5 |
| Spread | The relative bid-ask spread |
| SDRet | The standard deviation of daily returns from day *t*-25 to day *t*-5 |
| BM | The book value of equity/market value of equity |
| MV | The average market value of a stock from day *t*-25 to day *t*-5 |
| NumEst | The number of analysts for the stock |
| Disp | Analyst forecast dispersion |

**Table 2.1 Sample Restatement Firms and Descriptive Statistics**

Panel A describes the selection process for the sample financial restatements. From 1995 to 2019, 10,341 firms made 18,164 restatements. Among 3,357 survived restating firms from the selection process, 1,115 cases are classified as material restatements (related to irregularities per Hennes et al. (2008)) and 2,242 cases are classified as other non-material restatements. Panel B reports the restatement firms' characteristics, including all restatement firms and the subsets of material and non-material restatement firms.

| Panel A: Sample Selection | |
|---|---|
| Restrictions | Sample Size |
| Financial restatements in the sample period 1995-2019 | 18,164 |
| Subtract: | |
| Subsequent restatements | 7,896 |
| Firms without fundamental data from Compustat or CRSP | 5,823 |
| Firms in financial and utility industries | 1,088 |
| Restatement firms in the analyses | 3,357 |
| Classifications of restatement firms | |
| Material restatements | 1,115 |
| Other restatements | 2,242 |

Panel B: Financial Characteristics of Restatement Firms in the Announcement Year

| Variable | Mean | S.D. | Q1 | Median | Q3 |
|---|---|---|---|---|---|
| All Restatements | | | | | |
| Size | 5.634 | 2.214 | 4.176 | 5.614 | 7.167 |
| Cash | 0.211 | 0.233 | 0.037 | 0.119 | 0.306 |
| Leverage | 0.338 | 2.288 | 0.020 | 0.190 | 0.383 |
| Sales | 1.058 | 0.973 | 0.450 | 0.844 | 1.415 |
| PP&E | 0.496 | 1.011 | 0.162 | 0.356 | 0.696 |
| Return on Asset | -0.200 | 4.302 | -0.034 | 0.080 | 0.140 |
| Accruals | -0.255 | 3.674 | -0.138 | -0.065 | -0.018 |
| Number of Employees (thousand) | 8.090 | 28.398 | 0.200 | 0.953 | 4.663 |
| Market-to-Book (Ln) | 0.569 | 0.736 | 0.115 | 0.422 | 0.875 |
| Stock Return | 0.099 | 0.803 | -0.321 | 0.000 | 0.285 |
| Material Restatements | | | | | |
| Size | 5.621 | 2.040 | 4.216 | 5.648 | 7.037 |
| Cash | 0.211 | 0.224 | 0.036 | 0.122 | 0.313 |
| Leverage | 0.315 | 2.187 | 0.011 | 0.180 | 0.366 |
| Sales | 1.156 | 0.941 | 0.521 | 0.969 | 1.585 |
| PP&E | 0.457 | 0.425 | 0.161 | 0.344 | 0.666 |
| Return on Asset | -0.151 | 3.834 | -0.032 | 0.078 | 0.141 |
| Accruals | -0.209 | 2.613 | -0.142 | -0.068 | -0.019 |
| Number of Employees (thousand) | 8.783 | 33.191 | 0.269 | 1.080 | 5.060 |
| Market-to-Book (Ln) | 0.560 | 0.698 | 0.135 | 0.431 | 0.855 |
| Stock Return | 0.000 | 0.656 | -0.401 | -0.082 | 0.225 |

Continued

**Table 2.1 (Continued) Sample Restatement Firms and Descriptive Statistics**

| Variable | Mean | S.D. | Q1 | Median | Q3 |
|---|---|---|---|---|---|
| Other Non-Material Restatements | | | | | |
| Size | 5.640 | 2.297 | 4.156 | 5.592 | 7.235 |
| Cash | 0.212 | 0.237 | 0.037 | 0.117 | 0.299 |
| Leverage | 0.349 | 2.337 | 0.024 | 0.195 | 0.388 |
| Sales | 1.009 | 0.986 | 0.414 | 0.789 | 1.314 |
| PP&E | 0.515 | 1.201 | 0.162 | 0.363 | 0.707 |
| Return on Asset | -0.224 | 4.518 | -0.036 | 0.081 | 0.140 |
| Accruals | -0.277 | 4.102 | -0.136 | -0.062 | -0.018 |
| Number of Employees (thousand) | 7.747 | 25.692 | 0.167 | 0.900 | 4.459 |
| Market-to-Book (Ln) | 0.573 | 0.754 | 0.109 | 0.413 | 0.881 |
| Stock Return | 0.151 | 0.865 | -0.267 | 0.012 | 0.325 |

**Table 2.2 Adjusted Dynamics of the Use of Trade Credit Financing**

This table reports the adjusted dynamics of restating firms' reliance on trade credit financing. The dependent variables (trade credit to total borrowings and trade credit to total external financing) are relative to the average value of a control group, matched by age, size, and industry. Before and After are indicators for the 3-year periods before and after the announcement year. During is a dummy for the restatement year. The continuous dependent variables in the regressions are winsorized at the 1st and 99th percentiles. The *t*-statistics are reported in parentheses and are based on standard errors that are robust and corrected for firm-level clustering.

| | Trade Credit/Total Borrowings | | | Trade Credit/Total External Financing | | |
|---|---|---|---|---|---|---|
| | All | Material | Other | All | Material | Other |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Before | -0.011 | 0.006 | -0.021 | -0.047 | -0.055 | -0.042 |
| | (-1.58) | (0.51) | (-2.56) | (-7.93) | (-5.76) | (-5.54) |
| During | -0.014 | 0.009 | -0.028 | -0.028 | -0.023 | -0.032 |
| | (-1.94) | (0.75) | (-3.21) | (-3.88) | (-1.96) | (-3.40) |
| After | -0.010 | 0.026 | -0.030 | -0.022 | -0.005 | -0.032 |
| | (-1.44) | (2.25) | (-3.71) | (-3.61) | (-0.53) | (-4.12) |
| $R^2$ | 0.0010 | 0.0025 | 0.0066 | 0.0112 | 0.0125 | 0.0116 |
| N | 13,833 | 5,199 | 8,634 | 13,098 | 4,926 | 8,172 |
| | | | | *p*-values | | |
| Before = After | 0.8644 | 0.0725 | 0.3016 | 0.0002 | 0.0000 | 0.2167 |

**Table 2.3 Multivariate Regressions of the Change in the Use of Trade Credit Financing**

This table reports restating firms' tendency to switch to trade credit financing after restatement announcements using multivariate regression approaches. The dependent variables (trade credit to total borrowings and trade credit to total external financing) are relative to the average value of a control group, matched by age, size, and industry. Post is the indicator for the post-restatement period (three years after the announcement year). Control variables are measured at the beginning of the fiscal year. All continuous variables in the regressions are winsorized at the 1st and 99th percentiles. The *t*-statistics are reported in parentheses and are based on standard errors adjusted for the firm- and year-level clustering.

| | Trade Credit/Total Borrowings | | | Trade Credit/Total External Financing | | |
|---|---|---|---|---|---|---|
| | All | Material | Other | All | Material | Other |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Intercept | 0.000 | -0.004 | 0.024 | -0.050 | -0.032 | -0.026 |
| | (0.01) | (-0.11) | (0.62) | (-1.81) | (-0.90) | (-0.93) |
| Post | 0.006 | 0.049 | -0.008 | 0.030 | 0.051 | 0.025 |
| | (0.73) | (3.07) | (-1.03) | (4.55) | (4.06) | (3.03) |
| Ln(M/B) | 0.058 | 0.052 | 0.065 | -0.066 | -0.072 | -0.060 |
| | (7.11) | (4.29) | (6.10) | (-8.54) | (-5.76) | (-6.05) |
| Stock Return | -0.007 | 0.003 | -0.017 | -0.021 | -0.020 | -0.026 |
| | (-1.40) | (0.71) | (-2.29) | (-3.79) | (-3.55) | (-3.42) |
| Firm Size | -0.020 | -0.022 | -0.021 | -0.008 | -0.012 | -0.008 |
| | (-4.72) | (-4.13) | (-4.06) | (-2.44) | (-2.55) | (-1.78) |
| Cash | 0.407 | 0.420 | 0.403 | 0.281 | 0.250 | 0.311 |
| | (10.13) | (10.26) | (8.07) | (8.36) | (5.90) | (8.49) |
| ROA | -0.059 | -0.123 | 0.030 | 0.053 | -0.006 | 0.168 |
| | (-1.56) | (-7.16) | (1.94) | (1.31) | (-0.26) | (7.30) |
| Leverage | -0.338 | -0.398 | -0.306 | -0.084 | -0.109 | -0.078 |
| | (-3.81) | (-5.10) | (-2.56) | (-2.69) | (-3.27) | (-1.71) |
| PP&E Growth | -0.014 | -0.026 | -0.007 | -0.019 | -0.017 | -0.017 |
| | (-1.89) | (-2.12) | (-0.91) | (-3.18) | (-2.15) | (-2.09) |
| Employees Growth | -0.022 | 0.004 | -0.031 | -0.018 | 0.007 | -0.031 |
| | (-1.81) | (0.30) | (-2.24) | (-2.27) | (0.54) | (-2.96) |
| Marginal Tax Rate | 0.308 | 0.396 | 0.172 | 0.196 | 0.235 | 0.058 |
| | (4.36) | (4.08) | (1.99) | (2.58) | (2.95) | (0.78) |
| Industry & Year FEs | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 11,675 | 4,374 | 7,301 | 11,045 | 4,141 | 6,902 |
| Adjusted $R^2$ | 0.2680 | 0.3148 | 0.2503 | 0.0776 | 0.1019 | 0.0807 |

**Table 2.4 The Test of Information Advantage and Liquidation Advantage of Suppliers**

This table reports the results of examining whether suppliers' information advantage or liquidation advantage is more likely to explain the tendency to switch to trade credit financing after material restatements. The dependent variable is the adjusted trade credit financing to total borrowing for columns 1-2 and adjusted trade credit financing to total external financing for columns 3-4. Before (After) in Panel A indicates the pre-BAPCPA (post-BAPCPA) periods. Below (Above) in Panel B indicates that a firm's finished goods/inventories (INVFG/ INVT) ratio is lower (higher) than that of control firms with similar characteristics of size, age, and industry. Control variables are included in the regressions and are similar to Table 2.3. All continuous variables in the regressions are winsorized at the 1st and 99th percentiles. The *t*-statistics are in parentheses and are based on standard errors adjusted for the firm- and year-level clustering.

| Panel A: Multivariate Regressions of Change in the Use of Trade Credit Financing after Material Restatements - BAPCPA | | | | |
|---|---|---|---|---|
| | Trade Credit/Total Borrowings | | Trade Credit/Total External Financing | |
| | Before | After | Before | After |
| | (1) | (2) | (3) | (4) |
| Post | 0.057 | 0.048 | 0.078 | 0.040 |
| | (2.02) | (2.15) | (3.31) | (2.26) |
| Intercept | Yes | Yes | Yes | Yes |
| Controls | Yes | Yes | Yes | Yes |
| Industry & Year FEs | Yes | Yes | Yes | Yes |
| N | 1,087 | 2,149 | 1,022 | 2,031 |
| Adjusted $R^2$ | 0.4102 | 0.2873 | 0.2013 | 0.1074 |
| Panel B: Multivariate Regressions of Change in the Use of Trade Credit Financing after Material Restatements - INVFG/ INVT | | | | |
| | Trade Credit/Total Borrowings | | Trade Credit/Total External Financing | |
| | Below | Above | Below | Above |
| | (1) | (2) | (3) | (4) |
| Post | 0.038 | 0.051 | 0.023 | 0.059 |
| | (1.26) | (2.78) | (1.05) | (4.33) |
| Intercept | Yes | Yes | Yes | Yes |
| Controls | Yes | Yes | Yes | Yes |
| Industry & Year FEs | Yes | Yes | Yes | Yes |
| N | 942 | 3,420 | 896 | 3,236 |
| Adjusted $R^2$ | 0.4291 | 0.3090 | 0.1383 | 0.1015 |

**Table 2.5 Change in the Predictability of Sales by Trade Credit**

This table reports the change in the predictability of sales by trade credit before and after restatement announcements. The dependent variables are sales adjusted by total assets. High (Low) is the indicator for restating firms with the top (bottom) tercile access to trade credit. Firms are classified as High (Low) if they are in the top (bottom) tercile portfolio based on their annual trade credit ranking. To construct these tercile portfolios, I require that each year at least 30 firms with observations on trade credit are included in my sample. Post is the indicator for the post-restatement periods (three years after the announcement year). Control variables are measured at the beginning of the fiscal year. All continuous variables in the regressions are winsorized at the 1st and 99th percentiles. The *t*-statistics are reported in parentheses and are based on standard errors adjusted for the firm- and year-level clustering.

| | All Restatements | | | Material Restatements | | | Other Restatements | | |
|---|---|---|---|---|---|---|---|---|---|
| | Before | After | All | Before | After | All | Before | After | All |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Intercept | 1.571 | 1.580 | 1.542 | 1.589 | 1.717 | 1.587 | 1.621 | 1.523 | 1.562 |
| | (25.21) | (27.19) | (28.49) | (23.64) | (18.76) | (24.63) | (22.08) | (19.02) | (20.30) |
| High | 0.090 | 0.041 | 0.090 | 0.147 | -0.003 | 0.138 | 0.024 | 0.072 | 0.028 |
| | (3.46) | (1.39) | (3.29) | (2.70) | (-0.07) | (2.57) | (0.71) | (1.72) | (0.86) |
| Low | -0.219 | -0.275 | -0.218 | -0.202 | -0.329 | -0.209 | -0.258 | -0.229 | -0.255 |
| | (-7.59) | (-11.69) | (-7.32) | (-4.97) | (-9.14) | (-5.12) | (-7.27) | (-7.57) | (-7.37) |
| Post | | | 0.061 | | | 0.143 | | | -0.011 |
| | | | (2.08) | | | (3.29) | | | (-0.34) |
| High×Post | | | -0.048 | | | -0.141 | | | 0.041 |
| | | | (-2.58) | | | (-2.47) | | | (1.28) |
| Low×Post | | | -0.057 | | | -0.118 | | | 0.023 |
| | | | (-2.14) | | | (-2.67) | | | (0.78) |
| Firm Size | -0.080 | -0.077 | -0.078 | -0.077 | -0.082 | -0.080 | -0.089 | -0.079 | -0.081 |
| | (-8.12) | (-9.19) | (-9.45) | (-6.32) | (-6.27) | (-6.99) | (-7.90) | (-6.52) | (-6.81) |
| Ln(M/B) | 0.021 | 0.037 | 0.030 | 0.007 | 0.021 | 0.014 | 0.024 | 0.041 | 0.035 |
| | (0.74) | (1.47) | (1.43) | (0.21) | (0.43) | (0.45) | (0.62) | (1.52) | (1.39) |

Continued

**Table 2.5 (Continued) Change in the Predictability of Sales by Trade Credit**

| | All Restatements | | | Material Restatements | | | Other Restatements | | |
|---|---|---|---|---|---|---|---|---|---|
| | Before | After | All | Before | After | All | Before | After | All |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Accruals | -0.217 | -0.133 | -0.173 | -0.244 | -0.179 | -0.207 | -0.171 | -0.118 | -0.157 |
| | (-4.28) | (-2.34) | (-3.98) | (-3.44) | (-1.97) | (-3.17) | (-3.13) | (-1.92) | (-3.72) |
| Stock Return | 0.020 | 0.020 | 0.021 | 0.037 | 0.036 | 0.041 | -0.012 | 0.016 | 0.007 |
| | (0.85) | (1.29) | (1.22) | (1.13) | (2.33) | (2.16) | (-0.50) | (0.63) | (0.37) |
| ROA | 0.559 | 0.410 | 0.474 | 0.439 | 0.378 | 0.404 | 0.808 | 0.451 | 0.565 |
| | (5.80) | (4.96) | (6.01) | (3.99) | (3.43) | (4.54) | (8.32) | (3.70) | (4.06) |
| Employees Growth | 0.045 | 0.016 | 0.032 | 0.034 | 0.058 | 0.040 | 0.042 | 0.011 | 0.029 |
| | (1.53) | (0.65) | (1.66) | (0.87) | (1.05) | (1.64) | (1.25) | (0.40) | (1.24) |
| PP&E Growth | -0.090 | -0.060 | -0.075 | -0.074 | -0.059 | -0.069 | -0.089 | -0.053 | -0.073 |
| | (-4.73) | (-3.54) | (-5.37) | (-2.67) | (-3.10) | (-3.71) | (-4.08) | (-2.73) | (-4.53) |
| Industry & Year FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 6,369 | 6,684 | 13,053 | 2,349 | 2,287 | 4,638 | 4,008 | 4,396 | 8,404 |
| Adjusted $R^2$ | 0.3781 | 0.3976 | 0.3881 | 0.3990 | 0.3842 | 0.3941 | 0.3776 | 0.4055 | 0.3902 |

**Table 2.6 Market Reactions to Trade Credit Information - Trade Credit Portfolio Performance**

This table reports the results of DGTW adjusted returns (Daniel et al. (1997)) for trade credit portfolios held from the subsequent 1 to 90 trading days. In the subsequent three years after financial restatements, I construct the trade-credit portfolio based on firms' benchmark-adjusted trade credit. Specifically, I calculate restating firms' mean-adjusted trade credit by using model (1). I then sort restating firms into tercile portfolios according to their abnormal access to trade credit. The restating firms with the top tercile access to trade credit are assigned as the High trade-credit portfolio, and the ones with bottom tercile access to trade credit are assigned as the Low trade-credit portfolio. To construct these tercile portfolios, I require that each year at least 30 firms with observations on trade credit are included in my sample. The trade-credit access ranking is conducted within the sample firms of material restatements and other restatements separately. Panels A and B report the results for material restatements and other restatements, respectively. The *t*-statistics are reported in parentheses.

| Panel A: Material Restatements | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *t*+1 | *t*+2 | *t*+3 | *t*+4 | *t*+5 | *t*+10 | *t*+20 | *t*+30 | *t*+40 | *t*+50 | *t*+60 | *t*+70 | *t*+80 | *t*+90 |
| High | 0.000 | -0.001 | -0.002 | -0.003 | -0.003 | -0.001 | -0.003 | 0.005 | 0.010 | 0.012 | 0.012 | -0.004 | -0.005 | -0.007 |
| | (0.20) | (-0.30) | (-0.61) | (-0.89) | (-0.72) | (-0.24) | (-0.41) | (0.65) | (1.05) | (1.06) | (0.97) | (-0.30) | (-0.43) | (-0.54) |
| Medium | 0.005 | 0.004 | 0.004 | 0.005 | 0.005 | 0.009 | 0.009 | 0.011 | 0.028 | 0.032 | 0.018 | 0.012 | 0.007 | 0.005 |
| | (1.72) | (1.22) | (1.31) | (1.49) | (1.44) | (1.85) | (1.53) | (1.61) | (2.07) | (2.32) | (1.97) | (1.13) | (0.67) | (0.44) |
| Low | -0.001 | -0.003 | -0.001 | 0.001 | 0.001 | -0.005 | -0.001 | -0.007 | -0.010 | -0.015 | -0.023 | -0.027 | -0.038 | -0.033 |
| | (-0.57) | (-0.94) | (-0.22) | (0.31) | (0.14) | (-0.87) | (-0.19) | (-0.98) | (-1.06) | (-1.60) | (-2.20) | (-2.45) | (-3.41) | (-2.73) |
| High - Medium | -0.005 | -0.005 | -0.006 | -0.008 | -0.008 | -0.011 | -0.012 | -0.006 | -0.019 | -0.020 | -0.007 | -0.016 | -0.013 | -0.013 |
| | (-1.20) | (-1.11) | (-1.37) | (-1.69) | (-1.51) | (-1.43) | (-1.31) | (-0.61) | (-1.10) | (-1.11) | (-0.44) | (-0.98) | (-0.77) | (-0.70) |
| Medium - Low | 0.006 | 0.007 | 0.005 | 0.004 | 0.004 | 0.014 | 0.010 | 0.018 | 0.039 | 0.048 | 0.041 | 0.039 | 0.046 | 0.038 |
| | (1.69) | (1.52) | (1.04) | (0.73) | (0.79) | (1.90) | (1.16) | (1.81) | (2.25) | (2.75) | (2.96) | (2.55) | (2.91) | (2.19) |
| High - Low | 0.002 | 0.002 | -0.001 | -0.004 | -0.003 | 0.003 | -0.002 | 0.012 | 0.020 | 0.027 | 0.035 | 0.023 | 0.033 | 0.025 |
| | (0.54) | (0.52) | (-0.23) | (-0.80) | (-0.58) | (0.44) | (-0.16) | (1.15) | (1.49) | (1.84) | (2.18) | (1.45) | (1.95) | (1.40) |
| Panel B: Other Restatements | | | | | | | | | | | | | | |
| | *t*+1 | *t*+2 | *t*+3 | *t*+4 | *t*+5 | *t*+10 | *t*+20 | *t*+30 | *t*+40 | *t*+50 | *t*+60 | *t*+70 | *t*+80 | *t*+90 |
| High | -0.002 | -0.001 | -0.003 | -0.003 | -0.002 | -0.003 | -0.001 | -0.003 | 0.000 | 0.001 | 0.000 | 0.002 | 0.000 | -0.005 |
| | (-1.55) | (-0.90) | (-1.59) | (-1.35) | (-0.85) | (-0.99) | (-0.17) | (-0.62) | (-0.01) | (0.19) | (0.02) | (0.29) | (-0.01) | (-0.60) |

Continued

**Table 2.6 (Continued) Market Reactions to Trade Credit Information - Trade Credit Portfolio Performance**

| | *t*+1 | *t*+2 | *t*+3 | *t*+4 | *t*+5 | *t*+10 | *t*+20 | *t*+30 | *t*+40 | *t*+50 | *t*+60 | *t*+70 | *t*+80 | *t*+90 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium | -0.002 | -0.004 | -0.005 | -0.004 | -0.005 | -0.005 | -0.002 | -0.003 | -0.002 | 0.001 | 0.005 | 0.010 | 0.006 | 0.005 |
| | (-1.19) | (-2.37) | (-2.70) | (-2.03) | (-2.27) | (-1.89) | (-0.63) | (-0.69) | (-0.38) | (0.16) | (0.77) | (1.58) | (0.86) | (0.67) |
| Low | -0.006 | -0.008 | -0.008 | -0.009 | -0.009 | -0.011 | -0.013 | -0.005 | -0.008 | -0.005 | -0.011 | -0.011 | -0.014 | -0.015 |
| | (-4.06) | (-4.06) | (-3.51) | (-3.42) | (-3.15) | (-2.82) | (-2.28) | (-0.77) | (-1.15) | (-0.59) | (-1.14) | (-1.09) | (-1.31) | (-1.36) |
| High - Medium | 0.000 | 0.002 | 0.002 | 0.002 | 0.003 | 0.002 | 0.002 | 0.000 | 0.002 | 0.000 | -0.004 | -0.008 | -0.006 | -0.010 |
| | (-0.20) | (0.96) | (0.68) | (0.54) | (0.96) | (0.48) | (0.30) | (-0.02) | (0.24) | (0.04) | (-0.47) | (-0.76) | (-0.54) | (-0.89) |
| Medium - Low | 0.004 | 0.004 | 0.003 | 0.005 | 0.004 | 0.006 | 0.011 | 0.002 | 0.006 | 0.006 | 0.015 | 0.021 | 0.020 | 0.020 |
| | (2.27) | (1.71) | (1.12) | (1.39) | (1.19) | (1.34) | (1.66) | (0.29) | (0.78) | (0.61) | (1.44) | (1.84) | (1.64) | (1.57) |
| High - Low | 0.004 | 0.006 | 0.005 | 0.006 | 0.007 | 0.008 | 0.012 | 0.002 | 0.008 | 0.007 | 0.011 | 0.014 | 0.014 | 0.010 |
| | (2.12) | (2.50) | (1.67) | (1.89) | (1.98) | (1.62) | (1.78) | (0.25) | (0.90) | (0.59) | (0.92) | (1.05) | (1.02) | (0.71) |

**Table 2.7 The Predictability of Returns by Trade Credit - Regression Analysis**

This table reports the results of multivariate regressions of stock returns on the trade credit. The dependent variable is the DGTW-adjusted cumulative returns for the subsequent trading days from *t*+1 to *t*+90, where *t* is the date when the trade credit information is available. The key independent variables are High and Low, as defined in Table 2.5. I include a comprehensive set of control variables that can affect the information incorporation, including the abnormal trading volume (AVol), the ratio of the difference of a stock's daily high and low price to its daily high price (HLtoH), the cumulative return from days *t*-25 to *t*-5 (CumRet), a stock's average turnover from day *t*-25 to day *t*-5 (Turnover), the relative bid-ask spread (Spread), the standard deviation of daily returns from *t*-25 to *t*-5 (SDRet), the natural logarithm of the average market value of a stock from *t*-25 to *t*-5 (LnMV), the log of book-to-market ratio (LnBM), the log of the number of analysts plus one (LnNumEst) and the log of the dispersion of analyst forecasts (LnDisp). Panels A and B report the results for material and other restatements, respectively. All continuous regression variables are winsorized at the 1st and 99th percentiles. The *t*-statistics are reported in parentheses and are based on standard errors adjusted for the firm- and day-level clustering.

| Panel A: Material Restatements | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *t*+1 | *t*+2 | *t*+3 | *t*+4 | *t*+5 | *t*+10 | *t*+20 | *t*+30 | *t*+40 | *t*+50 | *t*+60 | *t*+70 | *t*+80 | *t*+90 |
| High | -0.002 | 0.000 | 0.000 | -0.003 | -0.004 | -0.007 | -0.007 | 0.001 | -0.007 | -0.008 | -0.009 | -0.015 | -0.013 | -0.008 |
| | (-0.43) | (0.09) | (0.06) | (-0.56) | (-0.55) | (-0.86) | (-0.75) | (0.09) | (-0.51) | (-0.48) | (-0.51) | (-0.79) | (-0.64) | (-0.38) |
| Low | -0.005 | -0.005 | -0.002 | 0.000 | 0.001 | -0.005 | 0.001 | -0.011 | -0.024 | -0.033 | -0.041 | -0.037 | -0.035 | -0.022 |
| | (-0.93) | (-0.79) | (-0.25) | (-0.03) | (0.08) | (-0.56) | (0.05) | (-0.89) | (-1.94) | (-2.12) | (-2.37) | (-1.98) | (-1.78) | (-1.10) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 1501 | 1501 | 1501 | 1501 | 1501 | 1499 | 1496 | 1495 | 1491 | 1488 | 1481 | 1478 | 1473 | 1471 |
| $R^2$ | 0.0081 | 0.0164 | 0.0127 | 0.0164 | 0.0174 | 0.0127 | 0.0189 | 0.0219 | 0.0313 | 0.0334 | 0.0340 | 0.0302 | 0.0252 | 0.0194 |
| Panel B: Other Restatements | | | | | | | | | | | | | | |
| | *t*+1 | *t*+2 | *t*+3 | *t*+4 | *t*+5 | *t*+10 | *t*+20 | *t*+30 | *t*+40 | *t*+50 | *t*+60 | *t*+70 | *t*+80 | *t*+90 |
| High | -0.004 | -0.004 | -0.003 | -0.002 | -0.002 | -0.004 | -0.001 | -0.001 | 0.003 | 0.003 | 0.007 | 0.002 | 0.003 | 0.000 |
| | (-1.46) | (-1.21) | (-0.96) | (-0.61) | (-0.49) | (-0.71) | (-0.11) | (-0.21) | (0.45) | (0.37) | (0.65) | (0.18) | (0.29) | (-0.02) |
| Low | -0.005 | -0.007 | -0.009 | -0.009 | -0.011 | -0.011 | -0.013 | -0.015 | -0.015 | -0.019 | -0.025 | -0.029 | -0.022 | -0.021 |
| | (-1.55) | (-1.68) | (-1.98) | (-1.93) | (-2.20) | (-1.88) | (-2.01) | (-1.88) | (-1.66) | (-1.80) | (-2.15) | (-2.27) | (-1.63) | (-1.43) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 2744 | 2744 | 2744 | 2744 | 2744 | 2742 | 2740 | 2736 | 2732 | 2724 | 2718 | 2710 | 2705 | 2698 |
| $R^2$ | 0.0140 | 0.0130 | 0.0065 | 0.0082 | 0.0073 | 0.0058 | 0.0041 | 0.0058 | 0.0092 | 0.0108 | 0.0121 | 0.0138 | 0.0094 | 0.0101 |

**Table 2.8 Addressing Sample Selection Bias Using Heckman's (1979) Selection Model**

Heckman's (1979) selection model is used to mitigate the concerns of sample selection bias. In the first step (results reported in columns (1) and (3)), I run a probit model using the entire sample to predict whether a firm is in the sample for the second step regression. The dependent variables in columns (1) and (3) equal one if the observations are included in the final sample for my baseline regression, zero otherwise. In the second stage (results are presented in columns (2) and (4)), I rerun the baseline regression with an added variable of Inverse Mills' ratio to control for selection bias. The dependent variables in columns (2) and (4) are trade credit/total borrowings (TC/TB) and trade credit/total external financing (TC/TEF). All continuous regression variables are winsorized at the 1st and 99th percentiles. The *t* (*z*)-statistics are reported in parentheses.

| | First Stage<br>D_TB<br>(1) | Second Stage<br>TC/TB<br>(2) | First Stage<br>D_TEF<br>(3) | Second Stage<br>TC/TEF<br>(4) |
|---|---|---|---|---|
| Intercept | 0.008 | 0.010 | 0.895 | 0.042 |
| | (0.02) | (0.23) | (1.33) | (0.53) |
| Post | -0.029 | 0.050 | 0.028 | 0.049 |
| | (-0.36) | (2.78) | (0.68) | (3.62) |
| Ln(M/B) | -0.028 | 0.050 | 0.083 | -0.075 |
| | (-0.37) | (3.50) | (2.11) | (-4.86) |
| Stock Return | -0.033 | -0.003 | -0.025 | -0.020 |
| | (-0.53) | (-0.70) | (-0.80) | (-3.19) |
| Firm Size | 0.057 | -0.020 | -0.013 | -0.010 |
| | (2.23) | (-3.50) | (-1.06) | (-2.12) |
| Cash | 0.290 | 0.419 | 0.640 | 0.193 |
| | (1.15) | (10.50) | (4.97) | (3.00) |
| ROA | -0.765 | -0.081 | 0.043 | 0.010 |
| | (-2.48) | (-2.83) | (0.40) | (0.41) |
| Leverage | 0.603 | -0.485 | 0.302 | -0.175 |
| | (2.97) | (-6.84) | (3.38) | (-4.63) |
| PP&E Growth | -0.150 | -0.036 | -0.070 | -0.014 |
| | (-2.30) | (-2.33) | (-1.92) | (-1.23) |
| Employees Growth | -0.094 | 0.002 | 0.066 | 0.002 |
| | (-0.93) | (0.09) | (1.18) | (0.12) |
| Marginal Tax Rate | 0.523 | 0.295 | -0.690 | 0.241 |
| | (0.93) | (2.67) | (-2.48) | (2.96) |
| Inverse Mills Ratio | | 0.455 | | -0.430 |
| | | (1.67) | | (-0.87) |
| Industry & Year FEs | Yes | Yes | Yes | Yes |
| N | 9,416 | 3,538 | 11,915 | 4,141 |
| [Pseudo] Adjusted $R^2$ | [0.4006] | 0.3489 | [0.1110] | 0.1108 |

**Table 2.9 Propensity-Score Matched Sample Regressions**

This table presents the results of reexamining Table 2.3 and Table 2.5 using the propensity score-matched sample. I match each material restating firm with a non-restating firm based on their propensity scores. Panel A reports the means and differences of key characteristics between material restating firms and matched control firms. Panel B and Panel C present the reexamination results of Table 2.3 and Table 2.5 from the propensity score matching. Control variables are similar to those in the corresponding tables. Industry fixed effect and matched pair dummies are included in each regression. All continuous regression variables are winsorized at the 1st and 99th percentiles. The *t*-statistics are reported in parentheses and are based on standard errors adjusted for the firm- and year-level clustering.

Panel A: Descriptive Statistics for Propensity Score Matched Subsamples

| Variable | Material Restating Firms | Matched Firms | Differences (*t*-statistics) |
|---|---|---|---|
| Ln(M/B) | 0.580 | 0.578 | 0.001 |
| | | | (0.08) |
| Size | 5.545 | 5.529 | 0.016 |
| | | | (0.30) |
| Stock Return | 0.141 | 0.153 | -0.012 |
| | | | (-0.62) |
| ROA | 0.027 | 0.033 | -0.005 |
| | | | (-0.80) |
| Cash | 0.252 | 0.251 | 0.001 |
| | | | (0.15) |
| Leverage | 0.211 | 0.200 | 0.012 |
| | | | (2.00) |
| Marginal Tax Rate | 0.246 | 0.250 | -0.003 |
| | | | (-1.13) |
| Accruals | -0.096 | -0.088 | -0.008 |
| | | | (-1.75) |
| PP&E Growth | 0.187 | 0.180 | 0.007 |
| | | | (0.60) |
| Employees Growth | 0.097 | 0.095 | 0.002 |
| | | | (0.20) |

Panel B: Trade Credit Financing Regression with Propensity Score Matched Subsamples

| | Trade Credit/ Total Borrowings | Trade Credit/ Total External Financing |
|---|---|---|
| Material | -0.018 | -0.064 |
| | (-1.76) | (-3.68) |
| Post | -0.009 | -0.013 |
| | (-0.68) | (-0.79) |
| Material×Post | 0.043 | 0.071 |
| | (2.73) | (3.66) |

Continued

**Table 2.9 (Continued) Propensity-Score Matched Sample Regressions**

| | Trade Credit/ Total Borrowings | Trade Credit/ Total External Financing |
|---|---|---|
| Intercept | Yes | Yes |
| Controls | Yes | Yes |
| Matched Pair Dummies | Yes | Yes |
| Industry FEs | Yes | Yes |
| N | 4,816 | 4,592 |
| Adjusted $R^2$ | 0.6554 | 0.3098 |
| Panel C: Trade Credit and Sales Regression with Propensity Score Matched Subsamples | | |
| | Firm Sales | |
| Material | -0.030 | |
| | (-0.62) | |
| High | -0.017 | |
| | (-0.47) | |
| Low | -0.170 | |
| | (-3.81) | |
| Post | -0.046 | |
| | (-1.03) | |
| Material×High | 0.081 | |
| | (1.67) | |
| Material×Low | 0.018 | |
| | (0.26) | |
| Material×Post | 0.170 | |
| | (2.63) | |
| High×Post | -0.008 | |
| | (-0.14) | |
| Low×Post | 0.074 | |
| | (1.54) | |
| Material×High×Post | -0.100 | |
| | (-1.58) | |
| Material×Low×Post | -0.163 | |
| | (-1.88) | |
| Intercept | Yes | |
| Controls | Yes | |
| Matched Pair Dummies | Yes | |
| Industry FEs | Yes | |
| N | 5,303 | |
| Adjusted $R^2$ | 0.6773 | |

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