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Empirical Evidence from the French Stock Market

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Pricing Corporate Financial Distress:

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Abstract

This study examines whether financial distress, liquidity, and Value-at-Risk are sources of priced systematic risk in the stock returns of the French stock market. In particular, we investigate the explanatory power of the Fama and French (1993) model augmented by and substituted with these three risk factors for distressed and non-distressed firms. For this purpose, we construct nine portfolios composed of non-distressed firms and one portfolio consisting only of distressed firms. We find that for the portfolios of non-distressed firms, the financial distress factor is significantly priced only in the absence of the size and book-to-market factors. Not surprisingly, the financial distress is a systematic risk factor for the portfolio of distressed firms. Our findings also show that liquidity is priced for the portfolios of distressed and non-distressed firms. Furthermore, our empirical results show that only investors in the portfolios of non-distressed firms are rewarded for bearing Value-at-Risk (VaR) risk. Likewise, our findings indicate that the alternative model, constructed by substituting the Fama and French (1993) factors with the financial distress, liquidity and VaR risk factors, underperforms the Fama and French (1993) model, which, in turn, underperforms the considered augmented models. Our results provide insights both for international investors for new opportunities and for financial market supervisory authority.

Keywords: Equity pricing, Financial distress, Liquidity, Value-at-Risk, Systematic risk factors
JEL classifications: G11 G12, G32, G33

1- Introduction

One of the most important issues in empirical studies about financial markets in recent years has been the pricing of equity returns and determining the risk components driving asset returns. Finance theory suggests that equity returns are affected by systematic risks related to common factors and, in equilibrium, more risk-sensitive assets must compensate investors for holding the equity by offering higher returns (Lin et al., 2011). Research in finance has been significantly marked by the seminal study of Fama and French (1993), who propose a three-factor model for pricing equities. Numerous studies confirm the outperformance of the Fama and French (1993) model over the traditional Capital Asset Pricing Model (CAPM). While the CAPM perceives that excess returns can only be explained by the market premium, the Fama and French (1993) model shows that equity returns are affected by market, corporate size and corporate book-to-market premiums. Subsequently, several studies introduce additional factors to the three-factor model of Fama and French (1993) to provide a more reliable explanation of average excess returns.

Within the context of financial distress, a number of studies show that as financial distress is imminent or is ongoing, equity returns are affected. Asset pricing theory stipulates that investors will require a premium for investing in such stocks. The idea is that asset returns of firms with a high probability of financial distress tend to move together and, accordingly, their risk cannot be diversified and hence reduced (Campbell et al., 2008). This justifies the empirical concern of whether investors are compensated for bearing the risk of financial distress. In this context, Park (2015) suggests that distressed firm portfolios are generally found to have higher non-diversifiable risk (for instance, higher market beta, stock volatility, and default probability) but lower returns. The author considers the "high systematic risk to low return" relationship as anomalous since it contradicts basic financial theory.

In a separate area of the financial literature, researchers examine whether liquidity is a source of priced systematic risk (Ho and Chang, 2015; Lin et al., 2011; Naranyan and Zheng, 2010; Pastor and Stambaugh, 2003). The literature provides evidence of the emergence of the market liquidity risk factor as an important determinant of equity pricing. In another stream of research, only a few studies have examined the Value-at-Risk (hereafter VaR) as an additional risk factor to the Fama and French (1993) three factors. The VaR as a proxy for the predicted worst loss over a target horizon and within a given confidence level is a pertinent risk factor and is an appropriate risk

measurement that summarizes global exposure to market risks and hence could have effective explanatory power in stock returns (Jorion, 1996).

Systematic risk factors such as size, book-to-market, liquidity, relative distress and VaR, contribute to price financial assets and estimate their expected returns. Indeed, each of these risk factors systematically requires a risk premium to the extent that it captures a significant portion of systematic risk ignored by the market portfolio. The assessment of financial distress risk factor leads to a relevant choice of active and passive investment strategies in the assets of distressed (non-distressed) companies. The risk factors previously specified permit to identify highly (lowly) volatile financial assets, independently of their idiosyncratic risk.

This study aims to test whether financial distress, liquidity, and VaR are sources of priced systematic risk in the French stock market. This involves testing whether augmented models and/or alternative ones outperform the three-factor model of Fama and French (1993). Additionally, the objective of our study is to identify the risk factors that best capture the financial distress risk in the French market for the period spanning from 1998 to 2012.

In particular, we pose the following questions: 1) Do the financial distress, liquidity, and VaR risk factors drive returns of firms listed in the French stock market? 2) Does the inclusion of these additional risk factors enhance the performance of the Fama and French (1993) model? 3) Do financial distress, liquidity, and VaR risk factors subsume the size and book-to-market risk factors of Fama and French (1993)? 4) Is the behavior of risk factors similar for portfolios of distressed and non-distressed firms?

The choice of the French market is motivated by the limited number of studies that explore the explanatory power of the Fama and French (1993) model in the French context. Additionally, in recent years, statistics reveal that the number of French bankrupt firms is increasing. Thus, testing the Fama and French (1993) model in the context of the financial distress of French firms can provide important findings and offer fresh insights both for international investors for new opportunities and for financial market supervisory authority.

Our study contributes to the existing literature on corporate financial distress and equity returns pricing in four ways. First, our study is among the few ones that focus on the equity prices of distressed portfolios. Second, to the best of our knowledge, our study, which incorporates liquidity and VaR as systematic risk factors in the French context, is so far unique. Third, as far as we know, we are the first to introduce a model that simultaneously incorporates financial distress, liquidity

and VaR in the context of equity pricing. Fourth, relative to previous studies, we estimate a large number of models that are augmented versions of the three-factor model of Fama and French (1993), as well as an alternative version of it. The findings show that for the portfolios of non-distressed firms[1], liquidity and VaR are priced risks and hence contribute to moving equity prices up/down. For the portfolio of distressed firms, we find that financial distress and liquidity are systematic risk factors. Interestingly, we find that the explanatory power of the liquidity and VaR risk factors gets better when they are included together in the pricing model. Furthermore, our findings show that the alternative model, consisting of the market, financial distress, liquidity and VaR factors, underperforms the Fama and French (1993) model and the augmented models. We thus conclude that the best pricing model for French distressed firms is the one including the market, size, financial distress and liquidity risk factors. Moreover, for the portfolios of French non-distressed firms, liquidity and VaR are systematic risk factors that are priced in addition to the three factors of Fama and French (1993).

The rest of this paper is organized as follows. Section 2 discusses the related literature. In Section 3, we introduce the methodology, data and models. Empirical results are presented in Section 4 and discussed in Section 5. Section 6 concludes.

2- Literature review

Many criticisms of CAPM have emerged over time, and several empirical studies reject its validity. Fama and French (1992) observe that two classes of stocks tend to outperform the market as a whole: stocks with small caps and stocks with a high book-to-market equity ratio. Subsequently, Fama and French (1993) propose a three-factor model by including two additional risk factors, namely, corporate size (SMB) and corporate book-to-market (HML), in the CAPM in order to reflect the portfolio's exposure to risk.

While a great number of researchers have examined the validity of the Fama and French (1993) model in different contexts, unfortunately few studies have examined the French context. For instance, Molay (2000) finds that the positive relationship between HML and returns is less significant in the French context. Similarly, Malin and Veeraraghavan (2004) find that growth stocks generate higher returns than value stocks for equities listed in the French stock market.

[1] A firm is considered distressed if it has a judgment for financial distress declaration to the judicial tribunal of commerce during 2012-2013 period.

Another stream of research focuses on the robustness of the Fama and French (1993) model and its extensions in the context of financial distress. According to Fama and French (1993), the average HML return is a premium for a state variable risk linked to relative distress. Furthermore, Fama and French (1994) find that variations through time in the loadings of industries on HML correctly reflect periods of industry power or distress. Likewise, Fama and French (1996) suggest that their three-factor model is an equilibrium pricing model that captures much of the variations in the cross-section of average stock returns and absorbs a number of anomalies that have plagued the CAPM. The authors argue that SMB and HML factors are good proxies for financial distress.

To briefly sum up, a great number among the presented studies identifies SMB and HML as risk factors that successfully capture the default risk. For the size factor, SMB, the evidence suggests that small firms must generate higher equity return than big firms since small firms are more likely to fail than big ones during recession periods. Hence, considerable positive variations in the SMB factor should be related to systematic default risk. For the HML factor, the fact that firms with high book-to-market value tend to have persistent low earnings makes them less creditworthy than low book-to market value firms. For this reason, HML can be considered as a default risk factor. These findings go along with the following hypotheses:
H_1: The size factor, SMB, is a systematic risk factor that captures the firm's financial distress.
H_2: The value factor, HML, is a systematic risk factor that captures the firm's financial distress.

While the Fama and French (1993) model outperforms the CAPM, its performance against other multifactor models is generally inconclusive (Rahim and Nor, 2006). Indeed, Fama and French (1996) assert that their model, like any other model, has some weaknesses and cannot explain all asset returns (Liu, 2006). Motivated by this assertion, two streams of research have emerged. The first does not consider SMB and HML as systematic factors and proposes other risk factors able to capture the missing beta risk. Hence, alternative models come into sight. The second stream of research augments the Fama and French model (1993) with additional risk factors. In this study, we examine the two streams of research, and we consider three risk factors that can be added to or substituted for the size and book-to-market factors of Fama and French (1993). These three risk factors are financial distress, liquidity, and VaR, which we subsequently introduce in the following three subsections.

2-1 Financial distress risk factor

A large strand of the literature considers that size and book-to-market factors of Fama and French (1993) are good proxies for financial distress. This finding makes a restricted number of studies interested in examining the explanatory power of a financial distress risk factor in explaining asset returns. Ferguson and Shockley (2003) show that relative distress and relative leverage factors subsume the powers of Fama and French's (1993) factors in explaining the cross-sectional average returns. Likewise, Vassalou and Xing (2004) show that default risk is a priced systematic risk and find that SMB and HML include important information related to default and hence are proxies for the default risk. In addition, Chou et al. (2010) put forward an augmented five-factor model, which combines the factors of Ferguson and Shockley (2003) with the Fama and French (1993) three-factor model. The empirical results show that the augmented five-factor model can explain almost all anomalies. In the same stream of research, Campbell et al. (2011) examine the performance of distressed firms using the CAPM and the Fama and French (1993) model. They find that distressed firms significantly underperform safe stocks by delivering lower returns. Indeed, the portfolios of distressed firms show high levels of volatility and market betas, indicating that they are risky and must deliver a high risk premium. A strategy that buys a portfolio of safe stocks and sells those of distressed firms is found to be promotable. This result suggests that the market has not priced distress risk appropriately. Furthermore, the authors find that the underperformance of distressed firms is present in all size and value quintiles, although the underperformance of distressed stocks is more pronounced for small firms. Likewise, Nielsen (2011) suggests that size and default risk share some common information but that size dominates in explaining stock returns.

Based on the above discussion, we propose to test the following third hypothesis:

H_3: Financial distress is a systematic risk factor that captures financial distress risk.

2-2 Liquidity risk factor

While the literature related to the importance of liquidity in asset pricing has been prominent for over a decade, studies on the liquidity risk[2] have emerged recently. Recent studies examine liquidity as an additional good candidate for equity pricing. These studies attribute to liquidity the role of a risk factor, similar to SMB and HML of the Fama and French (1993) model (Ho and Chang, 2015; Chai et al., 2013; Minović and Živković, 2012; Asl et al., 2012; Amihud, 2002).

[2] High probability of not being liquid would suggest that there is a liquidity risk

Nevertheless, very few studies focus on how liquidity risk is priced in the context of financial distress. Among these studies, we refer to Liu (2006), who views liquidity as a pertinent issue when the economy is in or is foreseen to be in a recessionary state. Everything else being equal, no investor has interest in holding shares of distressed companies. Firms with a high probability of default are unattractive to investors and hence are less liquid. The author speculates that liquidity risk may, to some extent, capture any default premium. Furthermore, a liquidity factor can capture distress risk more directly than size and book-to-market factors of the Fama and French (1993) three-factor model. In the Malaysian context, Rahim and Nor (2006) claim that investors should be interested in firm-specific factors, such as distress and liquidity levels. The authors document that, rationally, small size in itself does not make a firm riskier. Rather, it is the firm's risk of being in distress and the risk of illiquidity that incite investors to look for higher than market-risk premiums. To sum up, findings are unanimously in agreement with a pricing model that includes a liquidity risk factor. It seems rational that a great number of investors require higher expected returns on stocks whose returns are sensitive to liquidity. Accordingly, we can hypothesize that:

H_4: Liquidity is a systematic risk factor that captures financial distress risk.

2-3 VaR risk factor

The concept of VaR is defined as the expected value that can be lost during critical and unfavorable market fluctuations (Marrison, 2002). Current research on asset pricing theory leaves a critical void in our knowledge, as only two empirical studies have been conducted to test whether the VaR is a source of priced systematic risk in stock returns. First, Bali and Cakici (2004) show that stocks with the lowest (highest) VaR are associated with the lowest (highest) average returns. In addition to market, SMB, and HML risk factors, a fourth factor based on VaR, HVARL (high VaR minus low VaR), is employed. Besides, they construct a liquidity factor – HILLIQL – defined as the difference between the average returns for the high-illiquidity and low-illiquidity portfolios. The conclusions highlight the additional explanatory power of the HVARL and HILLIQL factors in capturing the cross-sectional variation in expected returns. Likewise, following Bali and Cakici (2004), Chen et al. (2014) find that the HVARL factor of Bali and Cakici (2004) further captures the variation in emerging stock markets, especially for larger companies.

In this study, we extend the study of Bali and Cakici (2004) to the context of financial distress, and we propose testing the following hypothesis:

H_5: VaR is a systematic risk factor that captures distress risk.

3- Data, methodology, and model specification

3-1 Data

Our sample is composed of all French-listed firms (780 firms) from 1998 to 2012. We eliminate financial and banking firms (SIC[3] codes between 6000 and 6999), given that they have different financial, operating, and risk characteristics. Furthermore, companies with missing data are excluded. Due to the small number of French listed companies before 1998, and in order to obtain nine well-diversified portfolios constructed by crossing size and book-to-market ratio, our study period cannot be longer. Our final sample includes 543 firms.

We use the database Diane to collect the data required to compute the probability of financial distress one-year-ahead. The construction of risk factors requires accounting and financial data acquired from the Thomson One Banker database and historical stock prices obtained from the Datastream database. We use the French 1-month T-bill as a measure of the risk-free asset.

3-2 Methodology and model specification

One of the objectives of this study is to explore the explanatory power of the risk factors that best capture financial distress. To this end, we separate financially distressed firms from healthy ones and create a portfolio composed only of highly distressed firms. To select distressed firms, each year from 1998 to 2012, we sort firms according to their probabilities of financial distress.

To compute the probability of financial distress, we use the logistic model of Mselmi et al. (2017) with an average accuracy of 85.71%[4]. The authors use a sample of 212 French firms where half of them are financially distressed. While a great majority of studies focuses on the five ratios that Altman (1968) uses in his Z-Score model, Mselmi et al. (2017) suggest that they can better predict French financial distress using an ad hoc model (French context-specific model). The literature shows that the determinants of financial distress and the best-suited model to predict firms' financial distress vary across markets and classes of assets.

The probability of financial distress is computed as follows (Mselmi et al., 2017):

$$P = 2.4317 - 2.8145R_1 - 0.0834\,R_2 - 0.1196\,R_3 + 9.0795\,R_4 \quad (1)$$

[3] The Standard Industrial Classification Codes (SIC Codes) permit the classification of companies by their primary line of business.

[4] The stepwise regression is used to select, among a battery of financial ratios, the financial variables that significantly discriminate between distressed and non-distressed firms. See Mselmi et al. (2017) for more details.

where P is the probability of financial distress and R_1, R_2, R_3 and R_4 denote the liquidity ratio, solvency ratio, debt to equity ratio and long-term liabilities to total assets ratio, respectively. Each year during the sample period, we select the top 20% of firms with the highest probability of financial distress to form the equally weighted[5] distressed portfolio to be tested separately afterwards. After removing highly distressed firms, healthy firms (the remaining ones) are independently sorted at the beginning of each year by size and book-to-market ratio. The intersection of the independent sorting forms nine equally weighted portfolios. Subsequently, we identify the risk factors that systematically determine the monthly returns of the ten portfolios. For this purpose, we construct the SMB and HML risk factors following Fama and French (1993), as well as the financial distress (HFDL), liquidity (IML), and VaR (HVARL) risk factors. Table 1 summarizes the definitions and the measurement of dependent and independent variables that we use in our study.

After the construction of the risk factors, we first estimate the Fama and French (1993) three-factor model (Model 1). We then estimate the respective considered augmented models by adding, separately, the HFDL, IML and HVARL risk factors (Models 2, 3, 4), then jointly (model 5). Subsequently, in order to test whether the additional risk factors can substitute for the SMB and HML factors of Fama and French (1993), an alternative model that only incorporates the RMRF, HFDL, IML and HVARL risk factors is estimated (Model 6).

Model 1: $R_{i,t} - R_{f,t} = \alpha_{i,t} + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t$ (2)

Model 2: $R_{i,t} - R_{f,t} = \alpha_{i,t} + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HFDL_t$ (3)

Model 3: $R_{i,t} - R_{f,t} = \alpha_{i,t} + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 IML_t$ (4)

Model 4: $R_{i,t} - R_{f,t} = \alpha_{i,t} + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HVARL_t$ (5)

Model 5: $R_{i,t} - R_{f,t} = \alpha_{i,t} + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HFDL_t + \beta_5 IML_t + \beta_6 HVARL_t$ (6)

Model 6: $R_{i,t} - R_{f,t} = \alpha_{i,t} + \beta_1 RMRF_t + \beta_2 HFDL_t + \beta_3 IML_t + \beta_4 HVARL_t$ (7)

where $(R_i - R_f), \alpha_i$, and $RMRF$ refer to the monthly return on the portfolio i in excess of the risk-free rate, the constant term, and the market risk premium measured by the monthly return on the

[5] Molay (2000) argues that value weighting leads to more weight for large capitalisation profitability. Nonetheless, the portfolios of Fama and French (1993) control for size and book-to-market ratio; hence, equally weighted portfolios are required.

market portfolio in excess of the risk-free rate, respectively. SMB, HML, $HFDL, IML$, and $HVARL$ are risk factors related to size, value, financial distress, liquidity, and VaR, respectively. The β coefficients capture the sensitivity of sorted portfolio returns to the variations in the respective risk factors.

4- Empirical results

4-1 Descriptive statistics of the independent variables

Table 2 reports summary statistics and Sharpe ratios of monthly returns of the six risk factors. These returns correspond to risk premiums associated with these risk factors for the period 1998-2012.

The average return of the market premium is the lowest. It corresponds to the average market premium per unit of beta (market risk). Over the long term, the market risk premium needs to be positive since it rewards investors for taking risks. Nevertheless, in some cases, market fluctuations can provoke its shift to the negative side (Arnott and Ryan, 2001; Arnott and Bernstein, 2002). The average premium for the size-related factor, SMB, is 0.82% per month, indicating that investors buying small firms and selling big firms exhibit positive average returns. Moreover, the mean monthly return of the HML factor is equal to 1.32%. This suggests that longing firms with high book-to-market ratios and shorting ones with low book-to-market ratios generate positive returns. Surprisingly, we highlight that arbitrage strategy based on financial distress generates significant negative returns. The negative average return means that investors buying distressed firms and selling non-distressed firms exhibit negative returns. In other words, investors are not rewarded for bearing financial distress risk. Additionally, the financial distress factor is the least volatile. We find also that the average return of the liquidity factor is about -0.37%, showing that investors who buy illiquid firms and sell liquid ones exhibit losses. Additionally, the VaR premium is positive. Thus, investors buying firms with high VaR and selling ones with low VaR earn positive premiums. Examination of Sharpe ratios shows that the SMB factor has the highest ratio, followed by the HML, HVARL, and IML factors. The market and financial distress factors have the lowest ratios. Consequently, strategies based on size, value and VaR outperform those based on liquidity, market portfolio, and financial distress.

Correlation matrices and multicollinearity diagnostic statistics for the six risk factors are computed and presented in Table 3. If risk factors are highly correlated, then it is likely that they detect similar effects. On the other hand, when risk factors are not highly correlated, no much information is

likely to be lost (Chan et al., 1998). Our findings show that all the correlation coefficients are generally low, which satisfies the orthogonal relations between explanatory variables as suggested by Fama and French (1993). Exceptions are for some correlations. To confirm the correlation results, we proceed to an analysis of Variance Inflation Factor (VIF). We find that all explanatory risk factors have VIFs lower than 10, which proves the absence of a multicollinearity problem.

After having examined the returns of the explanatory factors, we now focus on the returns of the nine portfolios sorted by size and book-to-market ratio and those of the distressed portfolio.

4-2 Descriptive statistics of the dependent variables

Table 4 reports summary statistics and Sharpe ratios of nine portfolios composed of non-distressed firms sorted by size and book-to-market ratio (Panel A) and the portfolio of distressed firms (Panel B). Empirical results show that the average monthly returns in excess of risk free rate of all the size and book-to-market ratio sorted portfolios are negative, except for the LSHB portfolio. In addition, the average monthly return in excess of risk-free rate of the distressed portfolio is negative. This shows that these portfolios, excepting the LSHB portfolio, underperform the French Treasury bills-1 month (a risk-free rate).

We find that average returns tend to increase with book-to-market ratio in each size quintile. This finding confirms evidence provided by Fama and French (1992) concerning the presence of a positive relationship between book-to market ratio and average excess returns. Additionally, we confirm the Fama and French (1992) evidence about the presence of a negative relationship between size and average excess returns. Our findings show that the HBLS portfolio has the highest average return and the highest Sharpe ratio, showing that this portfolio outperforms all other portfolios. This is consistent with the evidence that value firms outperform growth ones and with the evidence that smaller firms tend to outperform large ones.

After focusing on the descriptive side of the excess returns of the constructed portfolios, we now regress these excess returns on a set of risk factors, i.e., the three factors of the Fama and French (1993) model in Eq. (2). We also test four augmented models (Eqs. 3-6) and an alternative model (Eq. 7) afterwards. To evaluate the performance of the different models, we compare their explanatory power measured by their pricing errors and their adjusted R^2.

4-3 Equity pricing model estimation results

In this subsection, we present the results of Fama and French (1993), the augmented models and the alternative one. In particular, we focus on the loadings and the coefficients of determination since, in time-series regressions, they indicate whether the different risk factors capture a common variation in stock returns (Chen et al., 2014).

4-3-1 Results of the Fama and French (1993)

Table 5 reports factor loadings for portfolios sorted by size and book-to-market ratio, after excluding distressed firms, and for the portfolio of distressed firms. The factors' loadings are estimated from time-series regressions of monthly equally weighted portfolios' excess returns on the factors of Fama and French (1993) model. As previously mentioned, the pricing error is among the tools used to assess the performance of pricing models. It represents the intercept of the time series regressions and corresponds to the proportion of the excess portfolio return that is not explained by the set of risk factors included in the regression. Findings show that all the intercepts are close to zero. Moreover, except for three portfolios, all the intercepts are insignificant. Besides, the market factor appears to explain the time-series average returns better than the size and value factors. Not surprisingly, all loadings on the size factor are significant, showing that the SMB factor captures shared variation in stock returns that is missed by the other risk factors. In addition, loadings on SMB are related to size. This finding is consistent with the results of Fama and French (1993), which stipulate that small firms earn higher returns than big firms. Subsequently, the hypothesis that the size factor is a proxy for systematic risk (H_1) is accepted.

Likewise, all loadings on the HML factor are significant. The value factor obviously captures shared variation in stock returns missed by the market and size factors. Our findings support the results of Fama and French (1993), which stipulate that value firms earn higher returns than growth firms. Consequently, the hypothesis that the value factor is a proxy for systematic risk (H_2) is accepted. Examination of the adjusted R^2 for the nine portfolios sorted by size and book-to-market ratio shows that the explanatory power of the Fama and French (1993) three-factor model is relatively high across the different portfolios. The results from the F-test indicate a global significance of the Fama and French (1993) three-factor model.

The results of the Fama and French (1993) time series regression for the portfolio of distressed firms one year ahead show that the abnormal return is significant. This result indicates that the returns of the default portfolio are not completely explained by the three risk factors of Fama and

French (1993). Like the results of the non-distressed portfolios, the market factor is significantly positive. The size factor is, in turn, significantly negative. This result reveals that the distressed portfolio does not consist mainly of small firms. Nevertheless, Campbell et al. (2008) document that in the U.S. context; the high failure risk portfolios have extremely high SMB coefficients, showing the prevalence of small firms among distressed stocks. The value factor is significantly positive, showing that the portfolio of distressed firms includes more firms with high book-to-market ratios. This result is confirmed by Campbell et al. (2008), who suggest that high failure risk portfolios have positive loadings on HML. The adjusted R^2 is high and equal to 93.60%. Moreover, the F-test indicates a global significance of the Fama and French (1993) model for the distressed portfolio. Interestingly, we can infer from our findings that the size and value factors include some information related to financial distress.

In the following, we test the Fama and French (1993) model augmented by the financial distress risk factor.

4-3-2 Results of Fama and French (1993) augmented by the financial distress risk factor

Our findings in Panel A of Table 6 show that the addition of the financial distress risk factor does not affect the abnormal return estimates of the non-distressed portfolios. All the intercepts keep their significance and signs unchanged. Moreover, the market factor remains significantly positive and conserves its greater ability in explaining average returns in comparison with the other factors. The financial distress risk factor is significant and negative only for three portfolios. We can conclude that the financial distress risk factor is not systematic for all non-distressed portfolios. The adjusted R^2 shows that the explanatory power of the augmented Fama and French (1993) model by the financial distress risk factor, compared to the one of the classical three-factor Fama and French (1993) model, remains almost unchanged for the portfolios of non-distressed firms. The fact that the adjusted R^2 does not considerably increase when the financial distress factor is included suggests that the latter does not improve the model more than would be expected by chance.

As expected, the addition of the financial distress risk factor affects the abnormal return estimates of the distressed portfolio. The intercept of the default portfolio actually becomes insignificant, which is an improvement compared to the Fama and French (1993) three-factor model. The market factor preserves its greater ability in explaining the excess returns of distressed portfolios. If all the priced information in SMB and HML is linked to financial distress, SMB and HML would lose their ability to explain equity returns in the presence of the default risk factor (Vassalou and Xing,

2004). Our findings in Panel B of Table 6 show that when the financial distress risk factor is included in the traditional Fama and French (1993) model, the size factor remains significant and its loadings vary from -0.4207 to -0.3017. Furthermore, the value factor becomes insignificant. The variation in the coefficients of SMB following the incorporation of the financial distress risk factor indicates that the latter shares common information with SMB. Additionally, the fact that HML becomes insignificant shows that it loses its explanatory power in the presence of a superior proxy for financial distress. More importantly, the financial distress risk factor is significantly positive. For the portfolio of distressed firms, the presence of a positive distress risk premium means that financial distress is a systematic priced risk. In other words, this positive premium is a compensation for financial distress risk. With the inclusion of financial distress factor, the average adjusted R^2 for the distressed portfolio increases. This indicates that the resulting four-factor model better explains excess returns compared to the traditional Fama and French (1993) model.

In the following, we test the Fama and French (1993) model augmented by the liquidity factor.

4-3-3 Results of Fama and French (1993) augmented by the liquidity risk factor

Our findings in Panel A of Table 7 show that the inclusion of the liquidity factor in the Fama and French (1993) model affects the abnormal returns of the non-distressed portfolios. In addition, the liquidity factor is significantly positive for the portfolios of high book-to-market ratio and significantly negative only for the portfolio MSLB. The adjusted R^2 increases slightly for six of the nine portfolios and decreases slightly for the remaining three portfolios. Subsequently, the liquidity factor seems to improve slightly the Fama and French (1993) model showing that it has an additional explanatory power for the portfolios of non-distressed firms.

Likewise, we find that the incorporation of the liquidity factor in the Fama and French (1993) model does not affect the significance and the sign of the abnormal returns of the portfolio of distressed firms (Panel B). The liquidity factor is significantly positive, showing that the portfolio of distressed stocks is rewarded a positive liquidity premium. Consequently, we can conclude that the liquidity factor is a systematic risk factor for the portfolio of distressed firms.

4-3-4 Results of Fama and French (1993) augmented by the VaR risk factor

The findings from the addition of the VaR risk factor to the Fama and French (1933) model are summarized in Table 8. The abnormal return estimates, market loadings as well as the loadings of SMB and HML factors of Panel A maintain their significance and signs unchanged compared to

those of the Fama and French (1993) model. The VaR factor is significant for six of the nine portfolios. It is negative for the portfolios of firms with high book-to-market ratios and positive for those with low book-to-market ratios. The adjusted R^2 shows that the incorporation of the VaR risk factor improves the Fama and French (1993) model. The addition of the VaR risk factor to the Fama and French (1993) model does not affect the abnormal return estimate, market loading, SMB coefficient, and HML loading for the portfolio of distressed firms. Additionally, the VaR coefficient is not significant showing that the VaR factor is not priced for distressed firms. Following the inclusion of VaR factor, the adjusted R^2 decreases from 93.60% to 93.56%.

4-3-5 Results of Fama and French (1993) model augmented by the financial distress, liquidity, and VaR risk factors simultaneously

Panel A of Table 9 shows that, like the results from using the three factors of Fama and French (1993), only three out of nine portfolios show significant abnormal returns. Following the addition of our three factors to the factors of Fama and French (1993), the loadings on the SMB factor for the MSHB and MSLB portfolios and the loading on the HML factor for the MSMB become insignificant. This shows that for these three portfolios, SMB or HML shares common information with the financial distress, liquidity and VaR risk factors. Moreover, we find that the financial distress risk factor maintains its significance and signs for three portfolios. Six of the nine loadings on the liquidity factor are significant. Examination of the adjusted R^2 shows that the joint incorporation of the financial distress, liquidity, and VaR factors improves the Fama and French (1993) model. Consequently, we can assume that financial distress, liquidity and VaR provide a significant additional explanation of the variation in portfolio's returns. Furthermore, size, book-to-market ratio, liquidity and VaR are systematic risk factors that are priced for the portfolios of non-distressed firms. Additionally, our results indicate that the explanatory power of the VaR factor improves in the presence of the financial distress and liquidity risk factors. Except for the LSLB portfolio, the loadings of the VaR factor are all significant. Similarly, our findings show that the explanatory power of the liquidity factor ameliorates in the presence of the financial distress and VaR risk factors.

Panel B of Table 9 reports the results for the portfolio of distressed firms. The joint addition of the financial distress, liquidity and VaR factors to the three factors of Fama and French (1993) model affects the abnormal return estimate of the default portfolio. In fact, the abnormal return becomes insignificant showing that the six factors explain well the average excess returns of distressed firms.

In other words, the six-factor model does not leave unexplained return for the portfolio of distressed firms. The market and size factors maintain their significantly positive loadings. As expected, the HML factor loses its explanatory power in the presence of the financial distress factor. The latter and the liquidity factor continue to be significantly positive. The VaR factor remains insignificant for the portfolio of distressed firms. The adjusted R^2 reaches the value of 95.37% showing an improvement of the pricing model. Hence, we conclude that size, financial distress, and liquidity are systematic risk factors that are priced for the portfolio of distressed firms (H_1, H_3, and H_4 are accepted).

To supplement the findings so far, and since the VaR factor is always insignificant for the portfolio of distressed firms, in the following we seek to examine the explanatory power of only the financial distress and liquidity factors, in addition to the three factors of Fama and French (1993), in explaining the excess returns of the distressed portfolio. The findings from Table 10 show that the removal of the VaR factor does not affect estimates of the abnormal returns and the remaining risk factors. Nevertheless, the adjusted R^2 increases to 95.40%. This indicates that the financial distress and liquidity factors in addition to the three factors of Fama and French (1993) are sufficient in explaining the excess returns of the distressed portfolio[6].

4-3-6 Results of the alternative model

If the alternative model described average excess returns well, we would expect to find higher adjusted R^2s and the regression intercepts statistically indistinguishable from zero. Table 11 reports the empirical results of the alternative model.

Our findings in panel A imply that our alternative model cannot well explain the average excess returns of the portfolios sorted by size and book-to-market ratio. In fact, the alternative factors leave a proportion of excess returns not explained. Examination of the adjusted R^2 shows that the alternative model underperforms the Fama and French (1993) model and the augmented models.

The findings in Panel B show that the alternative model cannot well explain the average excess returns of the portfolio of distressed firms since the abnormal return is significant.

[6] We also tried to remove the VaR factor for the nine portfolios sorted by size and book-to-market ratio, and we regressed the excess returns on the three factors of Fama and French (1993) together with the financial distress and liquidity factors. We found that the adjusted R^2s decrease.

5- Discussion

The pricing of default risk is a central issue in understanding financial economics. It consists in identifying and assessing the risk factors that systematically determine financial asset return across different asset classes. In a financial market that prices efficiently financial assets, a risk factor that contributes to explaining variations in expected returns must be systematically rewarded. The evidence from the previous subsections demonstrates that liquidity and VaR are priced for non-distressed portfolios and consequently investors are rewarded for bearing these two risks. Additionally, our findings indicate that for the portfolio of distressed firms, the VaR factor is not priced and that investors investing in such portfolios are rewarded by financial distress and liquidity premiums in addition to the size and market premiums. The Fama and French (1993) model augmented by financial distress and liquidity seems to be the best in explaining the average excess returns of the distressed portfolio in France. Additionally, the alternative model composed of the market, financial distress, liquidity and VaR factors is found to underperform the Fama and French (1993) model and the augmented ones. This result highlights the explanatory power of the size and value factors in the pricing of distressed and non-distressed firms in the French context. Our results corroborate those of Vassalou and Xing (2004), Campbell et al. (2008), Acharya and Pedersen (2005), Ho and Chang (2015), Chen et al. (2014) as well as Bali and Cakici (2004).

Our findings show that the VaR factor is not a systematic risk for distressed firms. Despite the fact that our study is the first to examine the explanatory power of VaR in pricing distressed firms in the French context, we find this result somewhat surprising since the principal goal of risk management through the computation of VaR is to remove the probability of costly lower-tail outcomes that would lead to financial distress (Stulz, 1996). Another interesting finding that we report in this study is that the explanatory power of the liquidity and VaR risk factors improves when they are included together in the pricing model. This can be seen in the number of liquidity and VaR loadings that are significant and in the adjusted R^2s.

6- Conclusion

The pricing of financial distress risk is a central issue in financial economics. In this study, we provide evidence on the role of the financial distress, liquidity and VaR risk factors in the pricing of French distressed and non-distressed portfolios over the period from January 1998 to December 2012. Our work is the first that combines these risk factors, applies them in the French context, and tests their abilities for explaining average excess returns of a financially distressed portfolio.

We first estimate the Fama and French (1993) benchmark model. We then consider five additional models; three of them are constructed by augmenting the traditional three-factor Fama and French (1993) model by the financial distress, liquidity and VaR risk factors separately. The fifth model is constructed by augmenting the benchmark model by these risk factors simultaneously. The sixth model is an alternative to the Fama and French (1993) model and is constructed by substituting the Fama and French (1993) factors with the financial distress, liquidity and VaR risk factors. Our empirical results consistently show that for the portfolios of non-distressed firms sorted by size and book-to-market ratio, liquidity and VaR are systematic risk factors which are priced in addition to the three factors of Fama and French (1993). Likewise, non-distressed portfolios with high book-to-market ratios and the distressed portfolio have a positive liquidity premium, while the non-distressed portfolios with low book-to-market ratios have a negative liquidity premium. We find also that the distressed portfolio is rewarded a positive distress premium. For the VaR premium, we find that portfolios of non-distressed firms with high book-to-market ratios have negative premiums whereas those of firms with low book-to-market ratios are rewarded positive premiums. Interestingly, we find that VaR risk is not priced for the portfolio of distressed firms. While the best model for pricing the portfolios of non-distressed firms sorted by size and book-to-market ratio is that consisting of the six risk factors, the best model to price the portfolio of distressed firms is composed only of the market, size, financial distress, and liquidity factors. Additionally, our findings show that the alternative model, composed of the market, financial distress, liquidity and VaR factors, underperforms the Fama and French (1993) model and the augmented models.

Our findings have practical implications as they help to promote the comprehension of the nature of distressed stocks and the different premiums of which an investor can take advantage depending on the risks that he is supposed to bear.

Augmented three-factor models can be considered as benchmark pricing models for estimating expected returns which have important implications for financial industry practice. Indeed, based on these benchmark pricing models, market investors can price assets more accurately. Besides, portfolio managers are more incline to implement efficient portfolio strategies. Portfolio strategy based on the risk factors previously specified (liquidity, relative distress and VaR) leads to a high rate of return, ceteris paribus. Insofar as this strategy is rewarded by these risk premiums, it outperforms the market portfolio strategy. Moreover, the different financial risk factors affect the cost of capital and consequently they affect investment decisions and firm value. Lastly, in the

context of a long-term event study, the valuation of abnormal returns must take into account the risk factors previously specified to make the event-specific impact more relevant and robust.
One can extend the research in diverse directions. For instance, a promising research avenue could consider the contribution of analyst coverage and risk-taking factors in the pricing of distressed and non-distressed portfolios.

Appendix:

Table 1. Summary of variable definitions

Variable name	Description
Dependent variables	
$(R_i - R_f)$	Return in excess of the risk-free rate of nine portfolios sorted by size, book-to-market ratio and the portfolio of distressed firms.
Independent variables	
$RMRF$	Market risk premium.
SMB	Represents the size premium. This variable expresses the difference in average monthly returns between the portfolio of small-cap firms and that of large-cap firms. The arbitrage strategy consists in buying the portfolio of small firms and selling the one of big firms.
HML	Represents the value premium. This variable expresses the difference in average monthly returns between the portfolio of firms with high book-to-market ratios and that of firms with low book-to-market ratios. The arbitrage strategy consists in buying the portfolio of firms with high book-to-market ratio and selling the one with low book-to-market ratio.
$HFDL$	Represents the financial distress risk premium. It is computed as the difference in average monthly returns between the equally weighted portfolio of highly distressed firms (top 20%) and the equally weighted portfolio of the least distressed ones (bottom 20%) after sorting the stocks based on their probability of financial distress.
IML	Represents the liquidity risk premium. This variable is computed as the difference in average monthly returns between the equally weighted portfolio of firms with low turnover ratio (bottom 30%) and the equally weighted portfolio of firms with high turnover ratio (top 30%).
$HVARL$	Represents the VaR risk premium. This variable is calculated as the difference in average monthly returns between the high-VaR and low-VaR of equally weighted portfolios. The median 5% VaR value is employed to divide the stocks into two groups: high-VaR and low-VaR groups (Chen et al., 2014).

Note: this table summarizes the dependent and independent variables used in this study.

Table 2: Descriptive statistics of monthly returns of explanatory factors.

RMRF is the market risk premium, SMB is the size premium, HML is the value premium, HFDL is the financial distress premium for one year before financial distress, IML is the liquidity premium, and HVARL is the VaR premium, respectively.

Variable	RMRF	SMB	HML	HFDL	IML	HVARL
Mean	-0.0137***	0.0082***	0.0132***	-0.0066***	-0.0037	0.0031
Std. Dev.	0.0697	0.0403	0.0662	0.0254	0.0747	0.0488
Min	-0.3041	-0.0813	-0.3702	-0.1472	-0.7129	-0.1353
Max	0.1730	0.3859	0.6016	0.0734	0.2136	0.4058
Sharpe ratio	-0.1966	0.2035	0.1994	-0.2598	-0.0495	0.0635

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively.

Table 3: Correlation matrix and multicolinearity statistics for the six risk factors

RMRF is the market risk premium, SMB is the size premium, HML is the value premium, HFDL is the financial distress premium for one year before financial distress, HILLIQL is the illiquidity premium, and HVARL is the VaR premium, respectively.

	RMRF	SMB	HML	HFDL	IML	HVARL
RMRF	1.0000					
SMB	-0.0713	1.0000				
HML	-0.0064	0.5824***	1.0000			
HFDL	-0.0387	-0.0762	0.3698***	1.0000		
IML	0.2913***	-0.7944***	-0.6726***	-0.0130	1.0000	
HVARL	0.5733***	0.4024***	0.2245***	-0.1649**	-0.0958	1.0000
VIF	1.8915	3.8814	2.7900	1.4695	4.5499	2.3040
TOL	0.5287	0.2576	0.3584	0.6805	0.2198	0.4341

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively.

Table 4: Descriptive statistics of portfolios sorted by size and book-to-market ratio and the portfolio of distressed firms:

Panel A summarizes descriptive statistics for nine portfolios sorted by size and book-to-market ratio after excluding distressed firms one-year ahead. Panel B reports the results of the distressed portfolio, and a default portfolio composed of distressed firms one-year ahead.

LS: low size, MS: medium size, HS: high size, HB: high book-to-market ratio, MB: medium book-to-market ratio, LB: low book-to-market ratio

Panel A: Portfolios sorted by size and book-to-market ratio

		Size		
		LS	**MS**	**HS**
Book to Market ratio		**Mean monthly returns in excess of risk-free rate**		
	HB	0.0005	-0.0152	-0.0104
	MB	-0.0139	-0.0192	-0.0164
	LB	-0.0127	-0.0191	-0.0197
		Standard deviation of monthly returns in excess of risk-free rate		
	HB	0.0739	0.0701	0.0816
	MB	0.0729	0.0717	0.0747
	LB	0.0795	0.0875	0.0878
		Minimum		
	HB	-0.2528	-0.3219	-0.3411
	MB	-0.3009	-0.2982	-0.3209
	LB	-0.2404	-0.2888	-0.3105
		Maximum		
	HB	0.2415	0.1776	0.3048
	MB	0.1981	0.1865	0.2073
	LB	0.2117	0.4549	0.3751
		Sharpe Ratio		
	HB	0.0071	-0.2173	-0.1278
	MB	-0.1909	-0.2673	-0.2195
	LB	-0.1595	-0.2182	-0.2239

Panel B: Portfolio of distressed firms

	Mean	Std. Dev.	Min	Max	Sharpe Ratio
Default portfolio	-0.0195	0.0743	-0.3342	0.1811	-0.2631

Table 5: OLS regression results of excess returns of portfolios sorted by size and book-to-market ratio and the portfolio of distressed firms on the three factors of Fama and French (1993) model:

Panel A summarizes OLS regression results for monthly excess returns of nine portfolios sorted by size and book-to-market ratio, after excluding distressed firms, on the three factors of the Fama and French (1993) model. Panel B reports the results of the OLS regression for the distressed portfolio Default composed of distressed firms. The sample covers the period from January 1998 to December 2012. LS: low size, MS: medium size, HS: high size, HB: high book-to-market ratio, MB: medium book-to-market ratio, LB: low book-to-market ratio

	Panel A: Portfolios sorted by size and book-to-market ratio									**Panel B: Portfolio of distressed firms**
	HB			**MB**			**LB**			
	HS	**MS**	**LS**	**HS**	**MS**	**LS**	**HS**	**MS**	**LS**	**Default portfolio**
α_i	0.0046**	-0.0025	0.0097***	0.0001	-0.0028**	-0.0007	0.0028	0.0015	-0.0002	-0.0038**
	(2.2210)	(-1.3540)	(3.7600)	(0.0810)	(-2.1530)	(-0.3290)	(1.4440)	(0.7290)	(-0.0470)	(-2.5900)
β_{RMRFi}	0.9952***	0.9028***	0.9313***	0.9833***	0.9684***	0.9478***	1.0852***	1.0925***	0.9442***	0.9941***
	(34.4300)	(35.5870)	(25.9600)	(57.4220)	(52.1590)	(28.8680)	(40.1770)	(39.2740)	(19.9360)	(49.1750)
β_{SMBi}	-0.8458***	-0.4447***	0.2241***	-0.6023***	-0.2587***	0.3112***	-0.1897***	0.3582***	0.4278***	-0.4207***
	(-13.7290)	(-8.2230)	(2.9300)	(-16.5000)	(-6.5380)	(4.4460)	(-3.2960)	(6.0400)	(4.2370)	(-9.7640)
β_{HMLi}	0.4125***	0.2458***	0.1289***	0.1405***	-0.0693***	-0.2056***	-0.4613***	-0.6461***	-0.2333***	0.0969***
	(11.0350)	(7.4930)	(2.7800)	(6.3470)	(-2.8850)	(-4.8420)	(-13.2050)	(-17.9570)	(-3.8090)	(3.7090)
Adjusted R^2	89.16%	88.66%	79.64%	95.47%	94.21%	82.49%	91.83%	91.27%	69.31%	93.60%
F-statistic	491.6	467.3	234.5	1257	971.1	282.1	671.8	625	135.8	873.0
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively. Student's t-statistics and p-values are given in brackets and square brackets, respectively.

Table 6: OLS regression results of excess returns of portfolios sorted by size and book-to-market ratio and the portfolio of distressed firms on the three factors of Fama and French (1993) model and the financial distress factor:

Panel A summarizes OLS regression results for monthly excess returns of nine portfolios sorted by size and book-to-market ratio, after excluding distressed firms, on the three factors of Fama and French (1993) model and the financial distress factor. Panel B reports the results of the OLS regression for the distressed portfolio default composed of distressed firms. The sample covers the period from January 1998 to December 2012. LS: low size, MS: medium size, HS: high size, HB: high book-to-market ratio, MB: medium book-to-market ratio, LB: low book-to-market ratio

	Panel A: Portfolios sorted by size and book-to-market ratio									**Panel B: Portfolio of distressed firms**
	HB			**MB**			**LB**			
	HS	**MS**	**LS**	**HS**	**MS**	**LS**	**HS**	**MS**	**LS**	**Default portfolio**
α_i	0.0051**	-0.0017	0.0092***	0.0005	-0.0033**	-0.0027	0.0007	-0.0022	0.0009	-0.0005
	(2.2690)	(-0.9140)	(3.3190)	(0.4210)	(-2.2990)	(-1.1130)	(0.3510)	(-1.1340)	(0.2570)	(-0.3440)
β_{RMRFi}	0.9964***	0.9049***	0.9294***	0.9846***	0.9672***	0.9417***	1.0787***	1.0812***	0.9475***	1.0043***
	(34.2990)	(35.5890)	(25.7920)	(57.3450)	(51.8900)	(28.9890)	(40.8310)	(42.0800)	(19.9370)	(56.6660)
β_{SMBi}	-0.8318***	-0.4193***	0.2018**	-0.5861***	-0.2725***	0.2402***	-0.2654***	0.2258***	0.4671***	-0.3017***
	(-12.4010)	(-7.1410)	(2.4260)	(-14.7820)	(-6.3300)	(3.2020)	(-4.3510)	(3.8060)	(4.2560)	(-7.3730)
β_{HMLi}	0.4005***	0.2241***	0.1479***	0.1267***	-0.0576**	-0.1448***	-0.3965***	-0.5328***	-0.2669***	-0.0048
	(9.1720)	(5.8630)	(2.7310)	(4.9090)	(-2.0550)	(-2.9660)	(-9.9850)	(-13.7960)	(-3.7370)	(-0.1830)
β_{HFDLi}	0.0495	0.0897	-0.0782	0.0572	-0.0483	-0.2507**	-0.2672***	-0.4673***	0.1387	0.4203***
	(0.5350)	(1.1070)	(-0.6810)	(1.0450)	(-0.8130)	(-2.4210)	(-3.1740)	(-5.706)	(0.9160)	(7.4400)
Adjusted R^2	89.11%	88.67%	79.58%	95.47	94.19%	82.96%	92.23%	92.6%	69.28%	95.11%
F-statistic	367.3	351.2	175.4	943.9	727.1	218.9	532.3	560.9	101.9	870.8
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively. Student's t-statistics and p-values are given in brackets and square brackets, respectively.

Table 7: OLS regression results of excess returns of portfolios sorted by size and book-to-market ratio and the portfolio of distressed firms on the three factors of Fama and French (1993) model and the liquidity factor:

Panel A summarizes OLS regression results for monthly excess returns of nine portfolios sorted by size and book-to-market ratio, after excluding distressed firms, on the three factors of Fama and French (1993) model and the financial distress factor. Panel B reports the results of the OLS regression for the distressed portfolio default composed of distressed firms. The sample covers the period from January 1998 to December 2012. LS: low size, MS: medium size, HS: high size, HB: high book-to-market ratio, MB: medium book-to-market ratio, LB: low book-to-market ratio

	Panel A: Portfolios sorted by size and book-to-market ratio									**Panel B: Portfolio of distressed firms**
	HB			**MB**			**LB**			
	HS	**MS**	**LS**	**HS**	**MS**	**LS**	**HS**	**MS**	**LS**	**Default portfolio**
α_i	0.0029 (1.3670)	-0.0041** (-2.1080)	0.0075*** (2.7470)	-0.0005 (-0.3880)	-0.0028* (-1.9560)	-0.0005 (-0.1950)	0.0039* (1.9130)	0.0041** (1.9910)	0.0004 (0.0940)	-0.0059*** (-3.9830)
β_{RMRFi}	0.9635*** (30.1160)	0.8725*** (31.154)	0.8871*** (22.4250)	0.9715*** (50.8300)	0.9702*** (46.5700)	0.9534*** (25.8850)	1.1071*** (36.7970)	1.1435*** (38.0970)	0.9539*** (17.9570)	0.9530*** (44.1110)
β_{SMBi}	-0.7164*** (-8.4670)	-0.3207*** (-4.3300)	0.4047*** (3.8680)	-0.5542*** (-10.9630)	-0.2659*** (-4.8280)	0.2885*** (2.9610)	-0.2791*** (-3.5070)	0.1499* (1.8890)	0.3879*** (2.7610)	-0.2529*** (-4.4280)
β_{HMLi}	0.4571*** (10.8460)	0.2885*** (7.8220)	0.1912*** (3.6690)	0.1571*** (6.2410)	-0.0717*** (-2.6150)	-0.2134*** (-4.3990)	-0.4921*** (-12.4160)	-0.7177*** (-18.1540)	-0.2471*** (-3.5310)	0.1547*** (5.4370)
β_{IMLi}	0.1194** (2.2060)	0.1143** (2.4140)	0.1665** (2.4890)	0.0443 (1.3710)	-0.0066 (-0.1890)	-0.0209 (-0.3360)	-0.0823 (-1.6180)	-0.1919*** (-3.7810)	-0.0367 (-0.4090)	0.1546*** (4.2320)
Adjusted R^2	89.39%	88.96%	80.23%	95.49%	94.17%	82.40%	91.91%	0.9189	69.17%	94.16%
F-statistic	378 [0.0000]	361.5 [0.0000]	182.6 [0.0000]	948.3 [0.0000]	724.4 [0.0000]	210.5 [0.0000]	509.1 [0.0000]	507.7 [0.0000]	101.4 [0.0000]	722.1 [0.0000]

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively. Student's t-statistics and p-values are given in brackets and square brackets, respectively.

Table 8: OLS regression results of excess returns of portfolios sorted by size and book-to-market ratio and the portfolio of distressed firms on the three factors of Fama and French (1993) model and the VaR factor:

Panel A summarizes OLS regression results for monthly excess returns of nine portfolios sorted by size and book-to-market ratio, after excluding distressed firms, on the three factors of Fama and French (1993) model and the financial distress factor. Panel B reports the results of the OLS regression for the distressed portfolio default composed of distressed firms. The sample covers the period from January 1998 to December 2012. LS: low size, MS: medium size, HS: high size, HB: high book-to-market ratio, MB: medium book-to-market ratio, LB: low book-to-market ratio

	Panel A: Portfolios sorted by size and book-to-market ratio									**Panel B: Portfolio of distressed firms**
	HB			**MB**			**LB**			
	HS	**MS**	**LS**	**HS**	**MS**	**LS**	**HS**	**MS**	**LS**	**Default portfolio**
α_i	0.0054***	-0.0009	0.0103***	0.0005	-0.0024*	-0.0003	0.0014	0.0008	-0.0004	-0.0038**
	(2.6320)	(-0.6030)	(3.9440)	(0.4550)	(-1.7840)	(-0.1280)	(0.7590)	(0.4380)	(-0.1230)	(-2.5730)
β_{RMRFi}	1.0671***	1.0371***	0.9794***	1.0246***	1.0159***	0.9907***	0.9534***	1.0394***	0.9202***	0.9922***
	(28.2900)	(34.3450)	(20.5790)	(45.7910)	(41.9880)	(22.7350)	(29.0920)	(28.3560)	(14.5600)	(36.7500)
β_{SMBi}	-0.7487***	-0.2632***	0.2891***	-0.5464***	-0.1945***	0.3692***	-0.3678***	0.2863***	0.3954***	-0.4232***
	(-10.8310)	(-4.7550)	(3.3140)	(-13.3230)	(-4.3880)	(4.6220)	(-6.1250)	(4.2620)	(3.4140)	(-8.5530)
β_{HMLi}	0.4066***	0.2348***	0.1249***	0.1372***	-0.0732***	-0.2092***	-0.4504***	-0.6416***	-0.2314***	0.0971***
	(11.0840)	(7.9950)	(2.7000)	(6.3030)	(-3.1100)	(-4.9340)	(-14.1330)	(-18.0000)	(-3.7640)	(3.6990)
β_{HVARLi}	-0.1692***	-0.3161***	-0.1133	-0.0974***	-0.1118***	-0.1009	0.3102***	0.1252**	0.0564	0.0043
	(-2.8860)	(-6.7340)	(-1.5310)	(-2.7990)	(-2.9730)	(-1.4910)	(6.0880)	(2.1970)	(0.5740)	(0.1030)
Adjusted R^2	89.59%	90.94%	79.80%	95.64%	94.45%	82.61%	93.22%	91.46%	69.19%	93.56%
F-statistic	386.1	450.1	177.8	981.7	763	213.6	616.3	480.1	101.5	651.1
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively. Student's t-statistics and p-values are given in brackets and square brackets, respectively.

Table 9: OLS regression results of excess returns of portfolios sorted by size and book-to-market ratio and portfolios of distressed firms on the six risk factors:

Panel A summarizes OLS regression results for monthly excess returns of nine portfolios sorted by size and book-to-market ratio, after excluding distressed firms, on the three factors of Fama and French (1993) model, the financial distress factor, the liquidity factor, and the VaR factor. Panel B reports the results of the OLS regression for the distressed portfolio default composed of distressed firms. The sample covers the period from January 1998 to December 2012. LS: low size, MS: medium size, HS: high size, HB: high book-to-market ratio, MB: medium book-to-market ratio, LB: low book-to-market ratio

	Panel A: Portfolios sorted by size and book-to-market ratio									**Panel B: Portfolio of distressed firms**
	HB			**MB**			**LB**			**Default**
	HS	**MS**	**LS**	**HS**	**MS**	**LS**	**HS**	**MS**	**LS**	**portfolio**
α_i	0.0029	-0.0038**	0.0061**	-0.0002	-0.0033**	-0.0029	0.0018	0.0003	0.0018	-0.0023
	(1.2970)	(-2.1260)	(2.1160)	(-0.1230)	(-2.2270)	(-1.1100)	(0.9450)	(0.1220)	(0.4730)	(-1.6140)
β_{RMRFi}	1.0403***	1.0062***	0.9456***	1.0136***	1.0128***	0.9896***	0.9775***	1.0753***	0.9294***	0.9672***
	(27.3370)	(33.9920)	(19.8080)	(44.3030)	(40.7080)	(22.4160)	(29.9870)	(31.7880)	(14.2760)	(41.0810)
β_{SMBi}	-0.5581***	-0.0428	0.5165***	-0.4649***	-0.1814***	0.3469***	-0.5603***	-0.0163	0.3473**	-0.1997***
	(-5.9080)	(-0.5830)	(4.3580)	(-8.1860)	(-2.9370)	(3.1660)	(-6.9240)	(-0.1940)	(2.1490)	(-3.4180)
β_{HMLi}	0.4788***	0.3168***	0.2506***	0.1578***	-0.0429	-0.1256**	-0.4611***	-0.6143***	-0.3016***	0.0441
	(9.8310)	(8.3610)	(4.1010)	(5.3900)	(-1.3490)	(-2.2230)	(-11.0490)	(-14.1870)	(-3.6200)	(1.4610)
β_{HFDLi}	-0.0491	-0.0517	-0.1867	0.0122	-0.0855	-0.2935***	-0.1534*	-0.3846***	0.1817	0.3911***
	(-0.5340)	(-0.7230)	(-1.6190)	(0.2200)	(-1.4220)	(-2.7520)	(-1.9470)	(-4.7060)	(1.1550)	(6.8740)
β_{IMLi}	0.1656***	0.1905***	0.2215***	0.0646*	0.0268	0.0366	-0.1293***	-0.1766***	-0.0735	0.1104***
	(3.0090)	(4.4480)	(3.2070)	(1.9510)	(0.7440)	(0.5730)	(-2.7410)	(-3.6070)	(-0.7800)	(3.2400)
β_{HVARLi}	-0.2124***	-0.3653***	-0.1828**	-0.1112***	-0.1263***	-0.1379**	0.3253***	0.1288**	0.0911	0.0166
	(-3.5420)	(-7.8310)	(-2.4300)	(-3.0830)	(-3.2220)	(-1.9820)	(6.3320)	(2.4170)	(0.8870)	(0.4470)
Adjusted R^2	89.99%	91.78%	80.81%	95.69%	94.46%	83.15%	93.67%	93.13%	69.13%	95.37%
F-statistic	269.3	334	126.6	663.5	509.7	148.2	442.1	405.4	67.8	616.2
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively. Student's t-statistics and p-values are given in brackets and square brackets, respectively.

Table 10: OLS regression results of excess returns of the portfolio of distressed firms on the five risk factors:

This table reports the results of the OLS regression for the distressed portfolio default composed of distressed firms on the three factors of Fama and French (1993) model, the financial distress factor and the liquidity factor. The sample covers the period from January 1998 to December 2012.

	α_i	β_{RMRFi}	β_{SMBi}	β_{HMLi}	β_{HFDLi}	β_{IMLi}
Default	-0.0023	0.9732***	-0.1876***	0.0461	0.3861***	0.1142***
	(-1.6270)	(50.1720)	(-3.6360)	(1.5490)	(6.9360)	(3.4630)
Adjusted R^2	95.40%					
F-statistic	742.8					

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively. Student's t-statistics and p-values are given in brackets and square brackets, respectively.

Table 11: OLS regression results of excess returns of portfolios sorted by size and book-to-market ratio and portfolios of distressed firms on the alternative risk factors:

Panel A summarizes OLS regression results for monthly excess returns of nine portfolios sorted by size and book-to-market ratio, after excluding distressed firms, on the market, the financial distress, liquidity, and VaR factors. Panel B reports the results of the OLS regression for the distressed portfolio default composed of distressed firms. The sample covers the period from January 1998 to December 2012. LS: low size, MS: medium size, HS: high size, HB: high book-to-market ratio, MB: medium book-to-market ratio, LB: low book-to-market ratio

	Panel A: Portfolios sorted by size and book-to-market ratio									**Panel B: Portfolio of distressed firms**
	HB			**MB**			**LB**			
	HS	**MS**	**LS**	**HS**	**MS**	**LS**	**HS**	**MS**	**LS**	**Default portfolio**
α_i	0.0092***	0.0019	0.0133***	0.0005	-0.0051***	-0.0036	-0.0095***	-0.0113***	-0.0021	-0.0025*
	(3.3960)	(1.0140)	(4.7000)	(0.3160)	(-3.6480)	(-1.4490)	(-3.8180)	(-4.2170)	(-0.5620)	(-1.8650)
β_{RMRFi}	1.1164***	1.0442***	0.9549***	1.0494***	1.0148***	0.9621***	0.9457***	1.0053***	0.8816***	0.9798***
	(22.7680)	(30.4220)	(18.5400)	(37.8290)	(40.4420)	(21.3990)	(20.8580)	(20.6340)	(13.2020)	(40.9720)
β_{HFDLi}	0.4627***	0.2723***	0.0449	0.1934***	-0.1211**	-0.4367***	-0.5969***	-1.0084***	-0.1405	0.4447***
	(4.5750)	(3.8450)	(0.4230)	(3.3810)	(-2.3390)	(-4.7090)	(-6.3830)	(-10.0330)	(-1.0200)	(9.0160)
β_{IMLi}	0.0966**	0.0146	-0.1371***	0.1538***	0.1253***	-0.0253	0.3750***	0.2041***	-0.0283	0.1633***
	(2.5700)	(0.5570)	(-3.4720)	(7.2370)	(6.5150)	(-0.7340)	(10.7900)	(5.4650)	(-0.5520)	(8.9060)
β_{HVARLi}	-0.2803***	-0.3123***	0.0244	-0.2179***	-0.1897***	-0.0599	0.0612	-0.0038	0.1325	-0.0342
	(-4.1110)	(-6.5410)	(0.3400)	(-5.6480)	(-5.4360)	(-0.9580)	(0.9700)	(-0.0570)	(1.4270)	(-1.0290)
Adjusted R^2	82.85%	88.58%	76.93%	93.46%	94.18%	81.95%	87.35%	85.28%	66.46%	95.07%
F-statistic	217.1	348.2	150.2	640.5	725.4	204.2	309.9	260.3	89.68%	864.5
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]

Note: ***, **, * denote two-tailed statistical significance levels at 1%, 5%, and 10%, respectively. Student's t-statistics and p-values are given in brackets and square brackets, respectively.

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