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The empirical study of Quality Minus Junk strategy in Korean stock market

한국 증시의 Quality Minus Junk 전략의 실증연구

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Abstract

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The research explains quality stocks which shows direct relevance to higher price, in other words market to book ratio. In Korea, High quality of stocks maintain its high quality in the future as well. A quality-minus-junk (QMJ) strategy is long high-quality stocks and short low-quality stocks earning significant risk-adjusted returns in the Korean stock market (KOSPI, KOSDAQ). The main finding is the excess return of QMJ is calculated as 1.77% which is higher and more significant compared to other components of quality (Profitability, Growth, Safety). The research result suggests using QMJ strategy on Korean stock market (KOSPI, KOSDAQ) can be practically useful.

Keywords: Quality, Junk, Profitability, Growth, Safety, QMJ, Korean stock market.

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Table of Contents

List of Tables

List of Figures

List of Appendix

I. INTRODUCTION

Quality stocks are a recent market anomaly that investors have demonstrated a growing interest in over the last few decades. While the popular previous anomalies have universally accepted definitions, this is not the case for quality. Each academician and specialists have their own explanation with their commonalities and differences. For example, Gross profit over assets(GPOA) which could be the highest representation of the quality concept (Novy-Marx, 2013) For Jeremy Grantham, founding father of the leading trade plus management firm Grantham, dressing and Van Otterloo, quality may be a combination of high returns, stable returns and low debt (GMO, 2004). For others, the study should look at undervalued ratios like the return on invested capital (Greenblatt, 2010). According to the QMJ factor, the presently studied model, quality is a combination of 16 accounting ratios that embody three aspects; profitability, growth, and safety (Asness, Frazzini, & Pedersen, 2019). Quality companies generate time stable profit generators. Also, these stocks are less risky and less volatility. This lack of volatility tends to underprice the stocks. Finance theory would have instructed that investors should over-pay for quality stocks. But it's usually the inverse development that happens given their low-risk profile (Asness et al., 2019). It started from this consideration to build their definition of quality: a quality stock has characteristics that, everything else equal, an investor would be willing to pay a higher price for. The question will be on which characteristics a payer would allow paying more? As mentioned at the beginning of this section, the answer lies in three components:

i. Profitability: everything else equal, a profitable company should command a higher price

ii. Growth: growing corporations ought to be expensive

iii. Safety: Payer attribute higher price to safe securities

The quality anomaly is part of the risk story of the rational finance theory. However, quality stocks by definition usually tend to be safer than usual ones. Thus, an investor make a profit from excess return when risk is kept quite low. This is one in all the explanation of why the quality firm is heavily investigated recently. It somehow refutes the risk-return relationship theoreticians relate to so much. "Quality stocks earn higher returns and however seem safer, not riskier, than junk stocks." (Asness et.,al 2018). The broad sample of Asness et.,al (2018) includes 24 developed countries excluded South Korea. Thus, the research tries to examine the quality minus junk (QMJ) strategy in the Korean stock market (KOSPI, KOSDAQ).

For the creation of quality, the research follows "Quality Minus Junk" by (Asness et.,al 2018). The research results are similar with the original paper. To analysis the relation of quality and prices (M/B), monthly cross sectional regressions of the logged market to book are run on quality scores and the time series average displays a positive and significant relation of quality and prices (M/B). Yet, the explanatory power of regression is quite low at a 2% R squared. In the Korean market, the excess returns of quality-sorted portfolios are significantly negative which means that this stock market has mispricing. However, the research finds high-quality stocks to take long position junk stocks take short position makes significantly positive returns and alphas. Concluding the main results of the research, the results show that QMJ profits in the Korean stock market. The study also shows that controlling for the market (beta) decreases quality premiums and profits.

The other parts of the research are structured as follows. Section 2 discusses theoretical background which includes literature review, explanation, and hypothesis of the quality score. Sources of data are explained in Section 3. Empirical study of QMJ and reports results are shown in Section 4. Finally, Section 5 summarizes this research.

II. THEORETICAL BACKGROUND

1. Literature review and Hypothesis

In addition to the papers already mentioned, the subject matter of this thesis is linked to a broad asset pricing literature. (Banz, 1981) finds that big firms command higher prices, and hence lower returns. Motivated by the idea that enormous stocks are additional liquid and have less liquidity risk than tiny corporations and so higher costs and lower needed returns (Asness et al., 2019). This is dubbed the size effect and the phenomenon of smaller firms outperforming bigger firms, in terms of excess returns, is documented repeatedly, for instance by Fama and French (1992), n.d.). Asness, Frazzini and Pedersen (2019) find that big firms continue to command higher prices even after controlling for quality, so the size effect remains robust.

The role of longing and shorting is investigated among the SMB (size), HML (value) and UMD (momentum) strategies by Israel & Moskowitz, (2013). They find that long positions make up most of SMB profits, more than half of HML profits and half of the momentum profits.

Underperform of the high credit risk Firms have been documented by (CAMPBELL, HILSCHER, & SZILAGYI, 2008). Kim & Lee, (2019) test and modify new hazard model that better fits Korean firms and outperforms another model in bankruptcy prediction accuracy. (Y. Kim & I.Choi (2013,) examine that Alman Z-score is useful in Korea.

Value stocks have been documented, time and again, to outperform growth stocks (Kothari, Shanken, & Sloan, 1995), Rosenberg, Reid, and Lanstein (1985), DeBondt and Thaler (1985), Fama and French (1992), Lakonishok, Shleifer and Vishny (1994), etc. Israel & Moskowitz, (2013) test the performance of the value strategy within size and find that the value premium decreases with firm size and shorting becomes less important for value as firm size increases.

On the goods market, the product quality can be assumed by its price. In other words, products usually have their own price according to their quality. Therefore, a common assumption is that a higher price means better quality and a lower price means cheaper or lower quality. Similar to this, on the financial market the securities such as stocks, bonds, and derivatives are traded by the price relatively relied on their quality. The quality measurement of the securities directly depends on the security issued firms' quality. Based on this assumption, the first hypothesis is that:

Hypothesis 1: High-quality stocks have higher prices that mean higher quality commands higher price.

People don't hesitate to buy good securities by paying higher price, in response, the securities' return decreases. Hence the higher price stocks have lower return, making a higher profit by buying these securities while selling the low-quality junk stocks seems impossible. But, as found by Asness, Frazzini, and Pedersen (2019), buying high-quality stocks and selling junk stocks makes significantly positive returns. Relied on this presumption, the next hypothesis is:

Hypothesis 2: When quality stocks are long and junk stocks are short strategy will work in the Korean stock market.

2. Quality score

Following the method of Asness, Frazzini, and Pedersen (2019), The research constructs the quality factor as a combination of profitability, growth, safety, and payout. Each of the four quality components is calculated by taking an average of a set of individual measure z-scores. The z-scores are computed as:

$$Z_i = \frac{(r_i - \bar{r}_i)}{\sigma(r_i)} \quad (1)$$

Where r_i , $\bar{r}_i$ and $\sigma(r_i)$ are the ranks of each measure, mean of the ranks and standard deviation of the ranks, respectively. The rank, mean and standard deviation are all cross sectional. The composition of each quality component is illustrated below and details regarding the calculation of each component's measures can be found in Appendix

$$Profitability = \frac{z_{GPOA} + z_{ROE} + z_{ROA} + z_{CFOA} + z_{GMAR} + z_{ACC}}{6} \quad (2)$$

The measures contained within the profitability component are gross profit over assets, return on equity, return over assets, cash flow over assets, gross margin, and low accruals.

$$Growth = \frac{z_{\Delta GPOA} + z_{\Delta ROE} + z_{\Delta ROA} + z_{\Delta CFOA} + z_{\Delta GMAR}}{5} \quad (3)$$

The growth measures are the three-year growth in all profitability measures. The sample data has a short duration of data due to the research considers three-year growth instead of five-year growth.

$$Safety = \frac{z_{BAB} + z_{LEV} + z_{H-score} + z_{Z-score}}{4} \quad (4)$$

The safety measures are low beta, low idiosyncratic volatility, low leverage, low bankruptcy risk in the form of New hazard-score is new CHS's hazard score (CAMPBELL et al., 2008) which modified by (D. Kim & Lee, 2015) for Korean firms, Altman's Z scores, and low earnings volatility. BAB, betting against beta, is minus market beta and is calculated using the methodology of Frazzini and Pedersen (2018). Betas are estimated as in Frazzini and Pedersen (2018) based on the product of the rolling one-year daily (120 trading days data required) standard deviation and the QMJ rolling three-year three-day (360 trading days data required) correlations. By Asness et al., (2013), for correlations, it is used three-day returns to account for nonsynchronous trading and a longer horizon so that correlations are more stable than volatilities. The study removes EVOL ratio from the safety ratio due to our sample duration is not enough for EVOL which is the standard deviation of quarterly ROE over the past 60 quarters.

$$Quality = \frac{z_{Profitability} + z_{Growth} + z_{Safety}}{3} \qquad (5)$$

Finally, the quality score is calculated by taking the average of the three components.

Quality sorted portfolios are formed by assigning stocks to ten portfolios each month, based on their quality score. They are value weighted and rebalanced every month to maintain their value weights. The portfolio breakpoints are determined using KOSPI stocks. The construction of QMJ portfolios follows the methodology of (Fama et al., 1992,1993 and 1996). The profitability, growth, safety and payout portfolios are constructed in the same manner as the QMJ portfolios. First, the dataset is split into half based on market capitalization, or size, each month using KOSPI breakpoints and ten quality sorted portfolios are formed within the universe of small and big stocks. Quality portfolios one, two and three within the small universe are denoted small junk, and portfolios eight, nine and ten are small quality. Similarly, the study obtains big junk and big quality portfolios. The QMJ return is the return from QMJ in both big and small stocks, as illustrated below.

$$QMJ = \frac{(Big\ Quality - Big\ Junk)}{2} + \frac{(Small\ Quality - Small\ Junk)}{2} \qquad (6)$$

III. DATA DESCRIPTION

The study uses monthly stock return data, annual accounting data, quarterly stock fundamentals from the FnGuide database. The sample consists of Korean (KOSPI & KOSDAQ) common stocks and runs from June 2000 to June 2019. However, results begin from June 2003, since three years of data are required for some quality characteristics. All missing, not reliable data, and data disclosed before IPO are removed from the main sample. The research sample duration is shorter than the U.S. due to some ratios(EVOL) which requires long term data are deleted.

Table 1 Summary statistics

This table reports the number of Korean (KOSPI, KOSDAQ) common stocks remaining within quality and each quality component after all data manipulations, in the sample period December 2003 to December 2018. The mean, standard deviation, minimum, median, maximum, skewness and kurtosis of the quality scores and each component's scores is also reported.

	N	Mean	SD	Min	Med	Max	Skew	Kurt
Profitability	21395	-2.35848E-18	0.64	-1.72	0.02	1.67	-0.12	-0.54
Growth	21395	-8.66851E-18	0.76	-1.73	0.02	1.73	-0.06	-0.76
Safety	21395	-3.34701E-18	0.66	-1.74	0.01	1.62	-0.06	-0.60
Quality	21395	1.1577E-17	0.56	-1.64	0.02	1.49	-0.16	-0.44

Table 1 reports some summary statistics. The number of stocks remaining within quality and its components, after all data manipulations, is reported as N. Also, the mean, standard deviation, minimum, median, maximum, skewness and kurtosis of the quality and component scores can be observed. The study has 21395 observations for quality and all components of quality after cleaning. The mean of quality is positive and the standard deviation of quality is lower than other three components. Also other statistic characters of quality are lower (excluding Median and Skewness) than components of quality. Growth has the highest characters and the means of components are nearly negative. Minimums of components are around -1.73, similar to each other. The summary statistic of ratios, including the components, are shown in Table A2 in Appendix.

IV. EMPIRICAL STUDY

1. Preliminary analysis

Before starting, the study should count that a stock's quality is persistent. That is, by selecting companies that were profitable, growing, and safe in the recent past, the study succeeds (except growth) in selecting companies that display these characteristics in the future. This step is very important once the research communicates the central analysis of whether or not the high-quality companies command higher price since, in a very advanced rational market, price ought to be associated with future quality characteristics (Asness et al., 2019).

Of course, predictability of quality is absolutely in line with an efficient market—market efficiency says solely that, since prices should reflect quality, stock returns ought to be unpredictable (or only predictable due to risk premium) (or only predictable due to risk premium), not that quality itself should be unpredictable. Table 2 analyzes the predictability of quality as follows. The table reports the value-weighted average of our quality measures across stocks in each of the portfolios. The table shows these average quality scores both at the time of the portfolio formation (time t) and in the subsequent 5 years (t + 60 months). By construction, the quality scores vary very similarly across portfolios at the time of portfolio formation, so the impressive part of the table is the forthcoming quality scores (Asness et al., 2018). Table 2 shows that, on average, high-quality firms today remain high-quality firms three and 5 years into the future. For the other components, profitability, and safety

Table 2 Persistence of Quality

This table shows average quality scores. Each decile's stocks in are ranked in escalating order on the basis of their quality score. The ranked stocks in KOSPI and KOSDAQ are appointed to one of 10 portfolios. Stock arranges are based on KOSPI breakpoints. The following table reports each portfolio's quality score at portfolio formation (date t) up to the next 5 years (date t + 60 months). Here, the table reports the time series mean of the value-weighted cross-sectional means. The sample period goes from December 2003 to December 2018.

		P1 (Low)	P2	P3	P4	P5	P6	P7	P8	P9	P10 (High)	H-L	H-L (t-value)
Quality	*t*	-0.840	-0.480	-0.281	-0.117	0.018	0.159	0.296	0.432	0.617	0.934	**1.774**	44.230
Quality	*t+12 M*	-0.417	-0.283	-0.133	-0.068	0.028	0.139	0.299	0.334	0.495	0.828	**1.245**	15.339
Quality	*t+24 M*	-0.225	-0.132	-0.071	-0.068	0.083	0.107	0.308	0.274	0.435	0.718	**0.942**	10.859
Quality	*t+36 M*	-0.061	0.063	0.001	-0.019	0.114	0.168	0.214	0.264	0.378	0.621	**0.682**	9.655
Quality	*t+48 M*	-0.133	0.084	0.024	-0.062	0.118	0.146	0.292	0.263	0.364	0.558	**0.691**	15.211
Quality	*t+60 M*	-0.029	0.092	-0.038	-0.051	0.147	0.127	0.239	0.289	0.358	0.592	**0.621**	6.377
Profitability	*t+60 M*	-0.387	-0.257	-0.203	-0.143	-0.072	-0.021	0.067	0.163	0.240	0.467	**0.854**	50.048
Growth	*t+60 M*	0.037	0.005	0.021	0.007	0.004	0.009	0.044	-0.023	-0.032	-0.040	**-0.076**	-2.920
Safety	*t+60 M*	-0.494	-0.390	-0.312	-0.222	-0.116	0.018	0.153	0.290	0.500	0.815	**1.309**	60.147

are the same as quality, they could keep their persistence excluding growth. High growth firms could not be having a stable growth in the Korean stock market (KOSPI, KOSDAQ).

In conclusion, quality is a persistent characteristic such that today's high quality anticipates future high quality. All components are persistence and significant except Growth. Growth is negatively persistent and significant. In the Korean stock market (KOSPI, KOSDAQ) high-quality firms keep their high quality, profitability, and safety in the future. However, the firms who are high quality could not remain their growth persistently.

2. Price of Quality

Given that future quality can be predicted, now it can be turned to the main question of how quality affects prices: do high-quality stocks command higher prices than low-quality ones? Accordingly, the study examines how the market to book ratio or price to book, moves with quality and its components;

$$logMB_t^i = a + bQuality_t^i + controls + e_t^i \quad (7)$$

$$logMB_t^i = a + b_1Profitability_t^i + b_2Growth_t^i + b_3Safety_t^i + controls + e_t^i \quad (8)$$

Through that, it can be revealed that do high-quality stocks higher prices than low-quality ones? This is completed by running yearly cross-sectional regressions of the log of a firm's market-to-book ratio on the quality score of each stock. Table 3 reports the time-series average of the resulting regression coefficients and Model 1, Model 2 are shown affection of quality to the market to book ratio (Equation 7) and from Model 3 to Model 10 are shown affection of other components to market to book ratio (Equation 8). As can be seen in Model 1, the price of quality is positive and highly significant. Thus, it can be concluded that high quality is linked to high prices according to the sample, in its cross section. The average adjusted R square, however, is a low 3%. It means that quality does not explain sufficient deal of the variation in prices. The average adjusted R square of multi variation regression is declined to 32% and all evaluated coefficients are significant. The price increases by 22%, if the quality score increases by 1 standard deviation. It is also included several controls. The Quality Score in model 1 (model 2), was calculated as the average of three main components which are profitability, growth, and safety, is comparable to result of model 9 (model 10) where these three components took place as separate variables in regression analyses. From the comparison between model 1 and model 9, recommends using quality score in price to quality regression is better than price to components of quality regression. Also, the comparison between model 2 and model 10 which have control variables shows a similar result. With the exception of dummy variables, it is measured each of these controls as the z-score of their cross-sectional rank for consistency and ease of interpretation of the coefficients. First, it is controlled for size, the theory that large stocks are more liquid and have less liquidity risk than small firms is motivated and thus higher prices and lower required returns (Amihud & Mendelson, 2008; Pástor & Stambaugh, 2003; Acharya & Pedersen, 2005). Consistent with this theory, it can be seen that larger firms do have higher prices, controlling for quality. This result is the analogue of the size effect on returns as Banz (1981) and Berk (1995) mentioned, it is expressed in terms of prices. Particularly, big firms, notwithstanding for the same quality, are more expensive, possibly leading to the return effect observed by Banz (1981). Motivated by the theory of learning about profitability by Pástor & Stambaugh (2003) it is also controlled for age, profit uncertainty, and a dividend payer dummy, as defined as in the research. Firm age is the cumulative number of years after the firm's IPO. Dividend payer is a dummy equal to one if the firm paid any dividends over the previous year. Persistent with Pastor & Veronesi (2003), it can be found that prices are lower for firms that pay dividends, decrease in age, and increase in profit uncertainly, exclusively for firms that pay no dividends. The research also controls for past stock returns. A positive coefficient on past returns usually reflects that high recent returns raise ongoing prices while the book value has not had time to adjust. For the multi variation regression, firm size, firm age, 1-year return, and dividend dummy increases (decreases) by 1 standard deviation, the price accordingly increases (decreases) by 33%, (21%), 16%, (62%). From Model 3 to Model

Table 3 Price of Quality

The table shows the results of annual Fama-Macbeth regressions. The dependent variable is the log of a firm's market-to-book ratio in each calendar year's (date t) June. The explanatory variables are the components of quality score and quality scores on date t plus a series of controls. "Firm size" is the log of the firm's market capitalization; "1-year return" is the firm's stock return over the previous year (Chang, Jo, & Li, 2018) "Firm age" is the cumulative number of years after the firm's IPO. "Dividend dummy" is a dummy equal to one if the firm paid any dividends over the previous year. All explanatory variables at time t are ranked cross-sectional and rescaled to have a zero cross-sectional mean with the exception of the "Dividend payer" dummy. "Average AdjR2 is the time series average of the adjusted R-squared of the cross-sectional regression. The coefficient estimates and statistical significance is indicated in bold, also T-statistics are shown below.

	1	2	3	4	5	6	7	8	9	10
Quality	**0.22**	**0.23**	-	-	-	-	-	-	-	-
	5.3	7.6								
Profit-ability	-	-	**0.16**	**0.17**	-	-	-	-	0.06	**0.09**
			5.0	8.2					1.8	5.2
Growth	-	-	-	-	**0.19**	**0.15**	-	-	**0.17**	**0.11**
					10.1	11.9			14.9	11.3
Safety	-	-	-	-	-	-	0.07	**0.07**	-0.02	-0.01
							1.7	2.1	-0.5	-0.1
Firmsize	-	**0.33**	-	**0.34**	-	**0.34**	-	**0.35**	-	**0.33**
		16.5		17.8		18.9		17.5		16.8
Firmage	-	**-0.21**	-	**-0.21**	-	**-0.21**	-	**-0.22**	-	**-0.20**
		-21.1		-21.1		-25.2		-21.5		-22.9
1-year return	-	**0.16**	-	**0.16**	-	**0.16**	-	**0.16**	-	**0.16**
		9.3		9.4		9.2		9.8		9.8
Dividend dummy	-	**-0.62**	-	**-0.61**	-	**-0.56**	-	**-0.56**	-	**-0.59**
		-30.6		-27.9		-20.9		-33.4		-37.3
Average AdjR2	0.03	0.32	0.02	0.31	0.03	0.32	0.02	0.31	0.05	0.33

8 show the tenderness of the components of quality to price. Controllers with components affect to price closely. The attitude of profitability, growth and safety are separately positive to the Price. However, only safety is not significant, others

significantly affect to Price. The average adjusted R squares are increased in comparison to without controllers. The comparison of Model 1 (Model 2), the result of price to quality regression (the result of price to quality and controllers' regression), and Model 9 (Model 10) which is the result of price to the combination of quality's components regression (the result of price to components of quality and controller's regression) shows that the affection of quality

Figure 1 Price of Quality

The following figure shows the coefficients from cross sectional regressions of standardized z scores of a stock's market to book on its quality. The Dec 2003 to Dec 2018, time series of the coefficients of the regression from Model 1, in Table 3 are shown. The dependent variable is the log of a firm's market-to-book ratio in each calendar year's (date t) June. The explanatory variables are the components of quality score and quality scores on date t plus a series of controls. "Firm size" is the log of the firm's market capitalization; "1-year return" is the firm's stock return over the previous year (Chang, Jo, & Li, 2018) "Firm age" is the cumulative number of years after the firm's IPO. Over the past year if the firm paid any dividends, it is a dummy equal to "Dividend dummy". All explanatory variables at time t are ranked cross-sectional and rescaled to have a zero cross-sectional mean with the exception of the "Dividend payer" dummy. "Average AdjR2 is the time series average of the adjusted R-squared of the cross-sectional regression.

combination of components is insignificant excluding growth. When we combine the three components, one standard deviation increase of profitability decreases price. A time-series representation of the cross-sectional price of quality is shown in Figure 1.

While varying between -0.1 to 0.5, the price of quality is considered as generally decreasing. Consistent with (Oh, Nam, Kim, & Lee, 2013) investors overreact future return on favorable stocks, the source of value (quality) leads that overreaction. To sum up, quality explains price better than the combination of components which includes profitability, growth, and safety. The research results are consistent with hypothesis 1 that high-quality firms command higher prices (scaled). Leaving a large amount of variation in prices unexplained, however, the explanatory power of quality is limited (Asness et al., 2018). Hence, to try to explain the limited relationship between price and quality, the research needs to analyze the future returns of quality stocks.

3. Quality-Sorted Portfolios

To construct quality-sorted portfolios, the research sorts all stocks on their respective quality score each month. Then, it uses KOSPI quality breakpoints to sort stocks into ten quality portfolios. Portfolios are value-weighted using market equity from the last trading day of the previous month. The research reports excess returns, alphas, and betas across the ten quality portfolios in Table 4. Again, the research obtains value-weighted cross -sectional means of excess return and then a time series average, within each decile, that is reported. The Sharpe ratio that is the excess return divided by the standard deviation of the value weighted excess returns in each decile, is reported as well. A time series regression of the value weighted excess stock return on excess market return yields an intercept which is reported as the CAPM alpha and the regression coefficient is reported as beta. Moreover, alphas for the three and four factor models which add SMB, HML and UMD as explanatory variables, along with excess return on the market, are reported. For the CAPM the study employs the first right-hand side variable, for the 3-factor model it uses the three first right-hand side variables, and for the 4-factor model the study also uses all right-hand side variables of Equation 9:

$$Exret_t^i = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + e_t^i \quad (9)$$

In the original paper, the authors claim that excess returns rise monotonically with quality. Still, there are extreme values in the bottom and top decile, which is valuable for the long-short strategy. In table 4, it can be seen reverse results for quality sorted excess returns as reported in the original paper. In the research case, excess return varies between -2.91% to -2.20% from decile two till decile ten, and decile one has by far the lowest excess return with -4.21%. It can be concluded that excess returns increase in ascending of quality such that high quality stocks outperform low-quality stocks. The return difference between the highest and lowest deciles and the

Table 4 Return of Quality sorted portfolios

The results of annual Fama-Macbeth regressions are shown in this table. The dependent variable is the log of a firm's market-to-book ratio in each calendar year's (date t) June. Each calendar month, stocks are assigned to two portfolios based on increasing market equity and breakpoints are established by KOSPI. The explanatory variables are the components of quality score and quality scores on date t plus a series of controls. The log of the firm's market capitalization is "Firm size"; the firm's stock return over the previous year (Chang et al., 2018) is "1-year return". The cumulative number of years after the firm's IPO is "Firm age". If the firm paid any dividends through the previous year it is dummy equal and called as "Dividend dummy". With the exception of the "Dividend payer" dummy, all explanatory variables at time t are ranked cross-sectional and rescaled to have a zero cross-sectional mean. "Average AdjR2 is the time series average of the adjusted R-squared of the cross-sectional regression. The coefficient estimates and statistical significance are indicated in bold, also T-statistics are shown below.

	P1 (Low)	P2	P3	P4	P5	P6	P7	P8	P9	P10 (High)	H-L
Excess return	**-0.0421**	**-0.0291**	**-0.0259**	**-0.0278**	**-0.0224**	**-0.0265**	**-0.0190**	**-0.0212**	**-0.0219**	**-0.0220**	**0.0200**
	-7.13	-5.74	-4.95	-5.34	-4.38	-5.15	-4.09	-5.01	-5.37	-5.73	4.16
Alpha (CAPM)	**-0.0131**	-0.0039	0.0017	-0.0002	0.0052	-0.0003	0.0050	0.0008	-0.0001	-0.0021	**0.0197**
	-3.26	-1.15	0.55	-0.07	1.81	-0.11	1.74	0.31	-0.04	-0.89	4.12
Alpha (3Factor)	**-0.0245**	**-0.0114**	**-0.0067**	-0.0047	-0.0002	-0.0063	0.0007	-0.0013	-0.0009	-0.0002	**0.0420**
	-5.02	-3.09	-2.06	-1.49	-0.07	-2.14	0.25	-0.54	-0.45	-0.10	9.31
Alpha (4Factor)	**-0.0266**	**-0.0118**	-0.0043	-0.0052	0.0003	-0.0065	0.0012	-0.0017	-0.0011	-0.0001	**0.0430**
	-5.37	-3.05	-1.33	-1.60	0.13	-2.15	0.41	-0.68	-0.50	-0.07	9.32
Betta	1.20	1.04	1.15	1.14	1.14	1.09	1.00	0.91	0.90	0.83	-0.38
Sharpe ratio	-0.51	-0.41	-0.36	-0.39	-0.32	-0.37	-0.30	-0.36	-0.39	-0.41	0.30
Adjusted R2	0.65	0.66	0.76	0.74	0.80	0.75	0.72	0.75	0.78	0.78	0.35

associated t-statistic are reported in the right-most column, showing that high-quality stocks earn higher average excess returns than low quality stocks by 2%, and the research can prove that with t-statistics of 4.16. When the study controls for market risk and other factor exposures, the outperformance in the alpha of high-quality stocks and their statistical significance is in fact larger. This higher outperformance arises as long as high-quality stocks actually have lower market exposures and lower exposures to

Table 5 Correlation of Component's return

This table reports the correlations between QMJ, profitability, safety, growth and payout strategy monthly excess returns for the long sample (July 2004 to June 2019) of KOSPI, KOSDAQ common stocks. Each calendar month, stocks are assigned to two portfolios based on increasing market equity and breakpoints are established by KOSPI. Quality is conditionally sorted within each size portfolio and QMJ and component strategy excess returns are obtained. Portfolios are value weighted and rebalanced every month to maintain their weights.

	Quality	**Profitability**	**Growth**	**Safety**
Quality	1.000	-	-	-
Profitability	0.875	1.000	-	-
Growth	0.702	0.607	1.000	-
Safety	0.676	0.568	0.206	1.000

other factors than low-quality stocks. That is to say, as measured by the CAPM or a three- and four-factor model, high-quality stocks are safer (have lower factor loadings) than low-quality stocks. Adjusting by the CAPM alone materially strengthens our results, as higher-quality stocks are, partly by construction, lower beta stocks (Asness Et Al, 2013). Across three risk models, the study employs, in our Korean stock market. sample, a portfolio that is long high-quality stocks and short low-quality stocks earn average abnormal returns ranging from 1.97% to 4.30% per month with associated t-statistics ranging between 4.12 and 9.32. Next results deal with analyzing the QMJ factor returns, as well as profitability, growth, and safety long-short strategy returns. Here, the study presents correlations between all the factor excess returns in Table 5. The research implies that all of the pairwise correlations among the quality components are positive. The average pairwise correlation among the quality components is 0.61 in the KOSPI, KOSDAQ. Also it is observed that Safety is weakly correlated with the other factors and with quality, while the other factors show higher degrees of correlation.

4. Quality Minus Junk Portfolios

After replicating the quality-sorted portfolios, the study proceedы with the replication of the QMJ factor. To construct QMJ, it sorts stocks conditionally on size and then on quality. Each month, stocks are sorted into two size portfolios, with the median KOSPI market equity as the size breakpoint. Next, both small and big stocks are sorted into three quality portfolios based on their total quality score by a 30/40/30 split. The lowest quality portfolios are characterized as junk and the highest quality portfolios are characterized as quality. These six portfolios are refreshed and rebalanced every calendar month to maintain value weights. The QMJ factor returns are the monthly average return of the small high-quality and big high-quality portfolios, minus the small junk and big junk portfolios (Equation 6). The study follows the same procedure to construct factor portfolios for profitability, growth and safety.

The table 6 describes the excess returns and alphas of QMJ and long/short quality component strategies. The construction of QMJ is outlined in Section 2 (Quality score). Specifically, the table reports the average excess returns and the alphas with respect to the CAPM, three-, and four-factor models. We see that each quality factor delivers a statistically significant positive excess return and alpha with respect to the CAPM, three-, and four-factor models in the Korean stock market sample. The excess return of Quality is calculated as 1.77% which is the highest and significant as you can see from the Table 6. The abnormal returns are positive and

Table 6 Return of QMJ

This table reports return characteristics of QMJ and component strategies for the long sample (July 2004 to June 2019) of Korean stock market (KOSPI, KOSDAQ) common stocks. Stocks are assigned to two portfolios based on increasing market equity and breakpoints are established by KOSPI in each calendar month. Quality is conditionally sorted within each size portfolio and QMJ and component strategy excess returns are obtained. Portfolios are value weighted and rebalanced every month to maintain their weights. The time series average of each strategy's excess returns is reported and Sharpe ratio is calculated as the excess return divided by the standard deviation of excess return in the strategy. Alphas are the intercept in a time series regression of the monthly excess return on excess return on the market, SMB, HML and UMD. T statistics are reported in brackets and significance is indicated in bold. Alphas and returns are calculated in monthly percent.

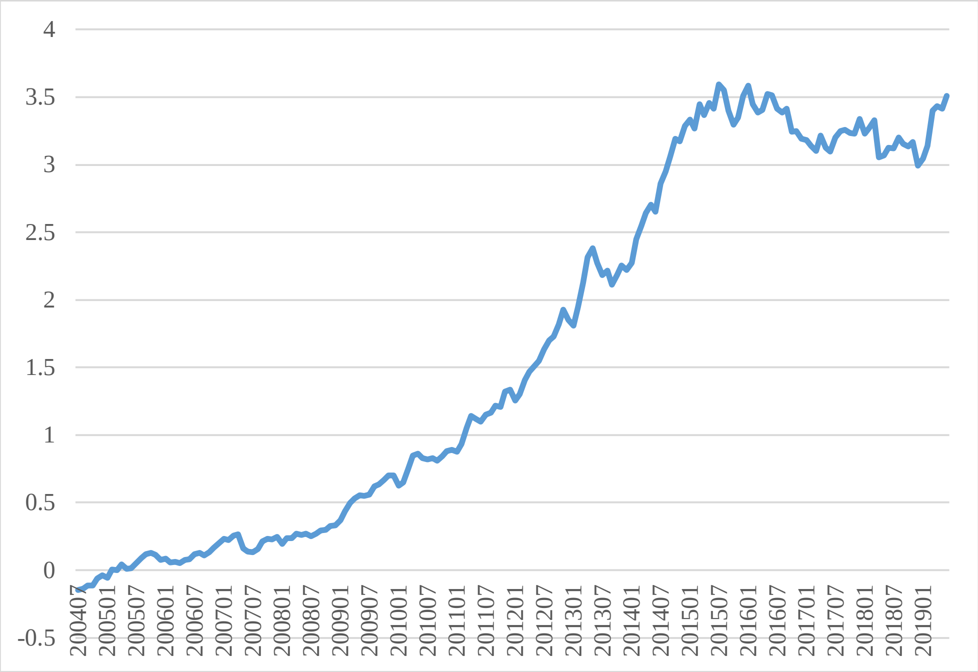
	QMJ	Profitability	Growth	Safety
Excess return	**0.0177**	**0.0165**	**0.0118**	**0.0171**
	7.88	8.03	5.77	6.28
Alpha (CAPM)	**0.0143**	**0.0150**	**0.0118**	**0.0083**
	5.96	6.66	5.22	3.23
Alpha (3Factor)	**0.0072**	**0.0086**	**0.0080**	0.0000
	3.13	3.95	3.40	-0.01
Alpha (4Factor)	**0.0082**	**0.0092**	**0.0079**	0.0018
	3.40	3.98	3.17	0.71
MKT	**-0.1321**	-0.0580	0.0032	**-0.3490**
	-3.65	-1.67	0.08	-9.38
SMB	**-0.3528**	**-0.3090**	-0.1543	**-0.3881**
	-7.53	-6.89	-3.18	-8.07
HML	**0.2011**	**0.2220**	**0.3114**	**0.3471**
	2.30	2.65	3.44	3.87
UMD	0.0753	0.0408	-0.0060	**0.1283**
	1.33	0.75	-0.10	2.21
Sharpe ratio	0.57	0.58	0.42	0.45
Adjusted R2	0.28	0.22	0.08	0.48

highly statistically significant. In our sample, a QMJ portfolio that is long high-quality stocks and short junk stocks delivers CAPM, three-, and four-factor abnormal returns of 1.43%, 0.72%, and 0.82% per month (with corresponding t-statistics of 5.96 3.13 and 3.40). Table 6 also shows the report of the risk-factor loadings for the four-factor model. QMJ has significantly negative size exposure and market. The relationship between The QMJ and value loading (HML) is significantly positive. The loadings on UMD lead to be smaller in magnitude and statistically insignificant in some of the items. In the study, it is shown that the QMJ strategy has significant factor exposures. Profitability and growth and safety, as other item factors of Quality, have positive excess returns which are exceedingly statistically significant. The safety factor brings significant alpha only in CAPM. The other 2 components show significantly positive alphas with respect to the CAPM, three-, and four-factor models. The loadings are persistent through quality sub-components, with safety, profitability all having same SMB, HML and UMD loadings in the Korean stock market (KOSPI, KOSDAQ).

In the Figure 2, it shows the QMJ factor's performance of over time in the Korean stock market. As well as, Figure 2 refers the cumulative summation of QMJ's 4 factor risk adjusted returns (time series regression alpha plus the regression residuals), showing that QMJ factor has regularly delivered positive risk adjusted returns over time. It is generally increased until end of 2014 and from then varying between 3.0-3.5.

Figure 2 Cumulative 4 factor alphas

This figure shows 4 factor cumulative abnormal returns (alpha plus regression residual) from the time-series regression. long sample (July 2004 to June 2019) of the Korean stock market (KOSPI, KOSDAQ) common stocks. Each calendar month, stocks are assigned to two portfolios based on increasing market equity and breakpoints are established by KOSPI. Quality is conditionally sorted within each size portfolio and QMJ and component strategy excess returns are obtained. Portfolios are value weighted and rebalanced every month to maintain their weights. The time series average of each strategy's excess returns is reported and the Sharpe ratio is calculated as the excess return divided by the standard deviation of excess return in the strategy. Alphas are the intercept in a time series regression of the monthly excess return on excess return on the market, SMB, HML and UMD.



The return evidence on the QMJ factors could be persistent with both mispricing (junk stocks are overreacted and quality stocks are underreacted) and risk (quality stocks underperform than junk stocks in Korea) that it is not fully captured by the above considered factor models. Consistent with Hypothesis 2, QMJ strategy that goes long high-quality stocks and shorts low-quality stocks earns significant risk-adjusted returns in the Korean stock market (KOSPI, KOSDAQ).

5. Robust test of QMJ

The research examines QMJ strategy in more detail by considering the performance of the quality factors using alternative risk factors. Table 7 reports the performance of the research quality factors using alternative risk-factors. Specifically, the study reports alphas relative to the five-factor model of Fama and French (2015) and the six-factor model augmented with the (UMD) momentum portfolio. The regression of six factor model will be:

$$Exret_t^i = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 CMA_t + \beta_5 RMW_t + \beta_6 UMD_t + e_t^i \quad (10)$$

While using this six-factor adjustment reduces the magnitude of the abnormal returns, the results are consistent with prior ones, however statistically not significant. QMJ portfolios earn positive returns, controlling for the five- or six-factor models. The study notes that QMJ portfolios have large positive loading on the RMW factor based on gross profit over assets (GPOA), which is not surprising given that GPOA is a component out our profitability composite. Nevertheless, alphas are positive, ranging from 0.0001% to 0.02% per month, and all of them are not significant. Said differently, RMW is a quality factor, so study is measuring the return of quality broadly defined, controlling for a narrow quality measure and other

Table 7 Robust test

These table reports return characteristics of QMJ and component strategies for the long term sample (July 2004 to June 2019) of the Korean stock market (KOSPI, KOSDAQ) common stocks. Each calendar month, the stocks are assigned to two portfolios based on increasing market equity and breakpoints which are established by KOSPI. Quality is conditionally sorted within each size portfolio and QMJ and component strategy excess returns are obtained. Portfolios are value-weighted and rebalanced every month to maintain their weights. The time-series average of each strategy's excess returns are reported and the Sharpe ratio is calculated as the excess return divided by the standard deviation of excess return in the strategy. Alphas are the intercept in a time series regression of the monthly excess return on excess return on the market, SMB, HML, RMW, CMA, and UMD. T statistics are reported in brackets and significance is indicated in bold. Alphas and return are calculated in monthly percent.

	QMJ	Profitability	Growth	Safety
Excess return	**0.0177**	**0.0165**	**0.0118**	**0.0171**
	7.88	8.03	5.77	6.28
Alpha (5Factor)	0.0002	0.0019	0.0026	-0.0042
	0.10	1.25	1.31	-1.86
Alpha (6Factor)	0.0000	0.0016	0.0018	-0.0027
	0.01	0.99	0.82	-1.14
MKT	**-0.1234**	-0.0434	-0.0016	**-0.3233**
	-5.26	-1.82	-0.05	-9.13
SMB	**-0.0838**	-0.0645	**0.0545**	**-0.2558**
	-2.54	-1.91	1.21	-5.13
HML	**0.1454**	**0.1845**	**0.2456**	**0.3618**
	2.60	3.23	3.23	4.28
CMA	**0.1646**	0.0920	**0.2271**	-0.1038
	2.79	1.53	2.83	-1.16
RMW	**0.7162**	**0.6851**	**0.4970**	**0.4617**
	14.14	13.26	7.23	6.04
UMD	0.0089	-0.0191	-0.0582	0.0969
	0.25	-0.53	-1.21	1.82
Sharpe ratio	0.57	0.58	0.42	0.45
Adjusted R2	0.72	0.66	0.39	0.57

factors. Furthermore, factor loadings to the market and size remain negative, indicating that high-quality stocks are safer than junk stocks in terms of these risk exposures (while CMA, RMW, and UMD have less clear interpretations as risk).

The main result of Robustness is persistent with the result of 3, 4-factor regressions and explanation of robustness is 72%. But alphas of 5, 6-factor model is not significant statistically. In the study result, high-quality stocks are overvalued (Plus HML factor) because of their high prices. Accordingly, long quality stocks make positive risk-adjusted returns. That proves hypothesis 2 again. Therefore, the QMJ strategy fits in the Korean stock market (KOSPI, KOSDAQ).

V. CONCLUSION

In Korea, quality score is a persistent characteristic such that today's high quality anticipates future (*t+60M*) high quality. The research defines quality security as one that has characteristics that should command a higher (scaled) price. Thus, the study creates empirical counterparts of each quality sub-component and quality in general, which are robust and inclusive from across the literature, testing the hypothesis that high-quality firms have higher scaled prices. Consistent with the theory, the study finds that high-quality firms do exhibit higher prices, on average. Even though, the explanation power (adjusted r square) of quality on prices is low, leaving the majority of cross-sectional dispersion in scaled prices is unidentified. In the Korean stock market (KOSPI, KOSDAQ), a quality-minus-junk (QMJ) factor which goes long high-quality stocks and shorts low-quality stocks earns significant risk-adjusted positive returns. The study results are also consistent with underpriced quality stocks being and overpriced junk stocks or with quality stocks being riskier than junk stocks. The study shows that quality stocks are low beta. Overall, the research could find the useful results of QMJ strategy in the Korean stock market (KOSPI, KOSDAQ).

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APPENDIX

Table A1 The composition of each quality component		
Profitability ratios		
GPOA	GPOA=GP/AT	Gross profits over assets
	GP	Gross profit (1000KRW)
	AT	Total assets (1000KRW)
ROE	ROE=IB/SEQ	Return on equity
	IB=NI	The income before extraordinary items, approximation of the net income=Net income (1000KRW)
SEQ	SEQ=TE-PSTK-MIBT	Stock holder's equity
	TE	Total equity(1000KRW)
	PSTK	Preferred Stocks (1000KRW)
	MIBT	Minority interest=Non controlling interest equity (1000KRW)
ROA	ROA=IB/AT	Return on Assets
CFOA	CFOA=((NI+DP-ΔWC-CAPX)=CF)/AT	Cash flow over assets
	DPAM	Depriciation & Amortization(1,000 KRW)
WC	WC=ACT − LCT − CHE + DLC + TXP	Working capital
	ACT	Current assets (1,000 KRW)
	LCT	Current liability (1,000 KRW)
	CHE	Cash & Cash equivalent (1,000 KRW)
	DLC	Short-term Debt (1,000 KRW)
	TXP	Income tax payable=Current income tax assets (1,000 KRW)
CAPX	CAPX=NPPE+NAI	Capital expenditures
	NPPE	Net amount PPE purchased (1,000 KRW)
	NAI	Net amount of intangibles purchase (1,000 KRW)
GMAR	GMAR=GP/SALE	Gross margin
	SALES	Sales (1,000 KRW)
ACC	ACC=−(ΔWC−DPAM)/AT	Low accruas

Growth ratios		
ΔGPOA	ΔGPOA=(GPt-GPt-5)/ATt-5	growth in gross profits over assets
ΔROE	ΔROE=(NIt-NIt-5)/SEQt-5	5 years growth in ROE
ΔROA	ΔROA=(NIt-NIt-5)/ATt-5	5 years growth in ROA
ΔCFOA	ΔCFOA=(CFt-CF-5)/ATt-5	5 years growth in CFOA
ΔGMAR	ΔGMAR=(GPt-GPt-5)/SALEt-5	5 years growth in GMAR
Safety ratios		
BAB	BAB=-β	beta
	Retd	Daily return %
	Retm	Monthly return %
	Rmd	Daily market return %
	Rmm	Monthly market return %
LEV	LEV=−(DLTT + DLC + MIBT +PSTK)/AT	Low leverage
	DLTT	Long-term debt (1,000 KRW)
Z-score	Z=(1.2WC+1.4RE=3.3EBIT+0.6ME+SALE)/AT	
	RE	Retained earnings (1,000 KRW)
	EBIT	EBIT (1,000 KRW)
	ME	Mil KRW
HAZARD Score	HAZARD=-3.83-1.58NIMTA+2.07TLMTA-2.11EXTRET-0.02RSIZE+1.36SIGMA-1.51CASHMTA-0.52PRICE-0.45SLMTA-3.70FFOMTA	Bunkrupcy score in Korean
NIMTA	NIMTA=NI/(ME+TL)	Net income to market-valued total assets
TLMTA	TLMTA=TL/(ME+TL)	Total liability to market valued total assets
EXRET	EXRET=log(1+Ri)-log(1+Rm)	Excess return on each firm’s equity relative to the KOSPI index
RSIZE	RSIZE=log(ME/TMV)	Log ratio of its market capitalization to that of the KOSPI index
	TMV	Kospi MV (Mil KRW)
	Sigma	From BAB
CASHTA	CASHTA=CHE/(ME+TL)	The ratio of a company’s cash and short-term assets to the market value of its assets
	PRICE	Closed price

SLMTA	SLMTA=SALE/(ME+TL)	Sales to market valued total assets
FFOMTA	FFOMTA=FFO/(ME+TL)	Cashflow from operating activity to market valued total assets
	TL	Total liability
	FFO	Cashflow from operating activity
	BE=SEQ	Book Equity

Table A2 Summary statistics

This table reports summary statistics of ratios which constructs quality component after all data manipulations, in the sample period December 2003 to December 2018. The mean, standard deviation, minimum, median, maximum, skewness and kurtosis of the quality scores and each component's scores is also reported.

	N	Mean	SD	Min	Med	Max	Skew	Kurt
GPOA	28479	0.18452	0.20781	-8.58347	0.14504	4.32295	2.08792	170.73647
ROE	28479	-0.19555	6.51373	-591.08345	0.04817	211.85456	-54.92575	4893.39105
ROA	28479	-0.03666	0.48389	-28.84425	0.02403	28.53117	-9.87645	1130.84226
CFOA	28479	-0.04254	0.38199	-16.03348	-0.00234	21.80640	2.91874	838.81030
GMAR	28479	0.21839	0.56896	-83.04125	0.17066	1.00000	-111.49488	16130.83481
ACC	28479	0.03751	0.32075	-10.07860	0.02242	21.23238	21.71837	1315.51550
D_GPOA	21405	0.06957	0.40784	-3.45526	0.02727	44.62575	63.50780	6687.14483
D_ROE	21405	0.05171	8.31167	-385.28925	0.00480	791.58490	60.47694	6211.09372
D_ROA	21405	-0.01085	0.52310	-41.06830	0.00363	15.19919	-32.59343	2440.46573
D_CFOA	21405	-0.04426	0.77153	-47.66763	-0.00266	37.52987	-24.79246	1855.60567
D_GMAR	21405	0.19709	3.19547	-29.02620	0.03140	360.66901	82.40534	8387.36677
BAB	26834	-0.84163	0.48571	-6.30071	-0.76460	0.75745	-1.37841	5.14797
LEV	26834	-0.21609	0.23470	-15.81690	-0.19156	0.16427	-21.94399	1332.66325
H-score	26834	6.90842	3.54470	-44.56002	6.25361	25.17049	-0.46973	3.28180
Z-score	26834	1.88996	2.06883	-127.01807	1.96387	41.18865	-13.92735	707.28840

Table A3 Persistence of Components

This table shows average quality scores. Each decile's stocks in are ranked in escalating order on the basis of their quality score. The ranked stocks in KOSPI and KOSDAQ are appointed to one of 10 portfolios. Stock arranges are based on KOSPI breakpoints. The following table reports each portfolio's quality score at portfolio formation (date t) up to the next 5 years (date t + 60 months). Here, the table reports the time series mean of the value-weighted cross-sectional means. The sample period goes from December 2003 to December 2018.

		P1 (Low)	P2	P3	P4	P5	P6	P7	P8	P9	P10 (High)	H-L	H-L (t-value)
Profitability	*t*	-1.04	-0.59	-0.35	-0.16	0.01	0.17	0.33	0.51	0.71	1.07	**2.11**	99.30
Profitability	*t+12 M*	-0.58	-0.34	-0.23	-0.12	-0.05	0.07	0.19	0.31	0.40	0.62	**1.20**	29.74
Profitability	*t+24 M*	-0.51	-0.32	-0.23	-0.12	-0.04	0.04	0.14	0.25	0.37	0.59	**1.10**	24.92
Profitability	*t+36 M*	-0.50	-0.31	-0.21	-0.13	-0.05	0.02	0.15	0.23	0.33	0.54	**1.04**	54.44
Profitability	*t+48 M*	-0.44	-0.30	-0.18	-0.13	-0.06	-0.02	0.11	0.19	0.28	0.48	**0.93**	41.39
Profitability	*t+60 M*	-0.39	-0.26	-0.20	-0.14	-0.07	-0.02	0.07	0.16	0.24	0.47	**0.85**	50.05
Growth	*t*	-1.21	-0.74	-0.48	-0.26	-0.07	0.13	0.32	0.52	0.76	1.17	**2.38**	138.12
Growth	*t+12 M*	-0.48	-0.36	-0.21	-0.12	-0.02	0.04	0.11	0.24	0.31	0.54	**1.02**	30.59
Growth	*t+24 M*	-0.16	-0.10	-0.09	-0.07	-0.03	0.02	0.06	0.11	0.10	0.19	**0.35**	10.74
Growth	*t+36 M*	0.31	0.12	0.06	0.01	-0.02	0.01	-0.03	-0.06	-0.12	-0.18	**-0.50**	-8.31
Growth	*t+48 M*	0.10	0.02	0.03	0.02	-0.01	0.01	0.02	0.00	-0.03	-0.08	**-0.18**	-4.47
Growth	*t+60 M*	0.04	0.01	0.02	0.01	0.00	0.01	0.04	-0.02	-0.03	-0.04	**-0.08**	-2.92
Safety	*t*	-1.05	-0.58	-0.34	-0.14	0.04	0.22	0.39	0.58	0.81	1.16	**2.21**	74.98
Safety	*t+12 M*	-0.82	-0.54	-0.34	-0.17	-0.01	0.15	0.30	0.49	0.70	1.03	**1.85**	53.56
Safety	*t+24 M*	-0.66	-0.50	-0.33	-0.19	-0.06	0.10	0.25	0.42	0.62	0.96	**1.63**	46.51
Safety	*t+36 M*	-0.58	-0.46	-0.32	-0.20	-0.10	0.06	0.22	0.37	0.57	0.89	**1.48**	54.18
Safety	*t+48 M*	-0.53	-0.42	-0.32	-0.21	-0.11	0.03	0.18	0.33	0.52	0.86	**1.38**	110.75
Safety	*t+60 M*	-0.49	-0.39	-0.31	-0.22	-0.12	0.02	0.15	0.29	0.50	0.81	**1.31**	60.15

요약 (국문초록)

한국 증시의 Quality Minus Junk 전략의 실증연구

서울대학교 대학원

경영학과 경영학 전공

다와다그와 에르덴다와

이 연구결과는 품질 주식은 Market to Book 비율이 높다는 특징을 갖는다. 한국에서는 고품질의 주식이 앞으로도 고품질을 유지한다. 한국 증시 (코스피, 코스닥) 에서는 고품질 주식과 저품실 주식의 차로 만든 품질 빼기 정크 (QMJ) 포트폴리오로 유의한 risk-adjusted return을 얻을 수 있다. 주요 결과는 QMJ의 초과 수익률이 1.77%로, 품질의 다른 성분 (수익성, 성장성, 안전성) 과 비교했을 때 더 높고 더 유의하다는 것이다. 한국 증시 (코스피, 코스닥) 에서 QMJ 전략의 실질적으로 유용하다는 결과를 찾을 수 있었다.

주요어: 품질, 정크, 수익성, 성장, 안전, QMJ, 한국 증시

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