Effects of human capital and fund characteristics on mutual fund performance in Malaysia [version 1; peer review: 1 approved with reservations]

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Abstract

Background: The evolution of the mutual funds industry has changed investors’ perspective. Instead of just focusing on which fund performances are best, investors pay great attention to who is managing and delivering superior returns in their investment portfolios. Nonetheless, it is very scant of comprehensive studies concern with human capital managerial characteristics that link with fund performances. Hence, this study proposes the integration of fund performances, managerial characteristics, systematic risk, expense, and turnover ratio, with single and simultaneous equations based on asset pricing models.

Methods: Using a sample of Malaysian fund managers, data from fund management companies, Thomson One database, and fund master prospectus over the periods of January 2012 to December 2014, the fund performance was measured using Jensen alpha (CAPM single factor), and Fama and French three-factor model on single and simultaneous equations. The examination was further carried out by employing the ordinary least squares and three-stage least squares methods.

Results: The results suggest that for fund managers, holding a business degree was the key factor to determine the fund performance, while having Master’s degree was not the primary concern. Fund performance and risk behavior varied across fund managers of different gender.

Conclusions: The expense ratio, turnover ratio, and fund objective were significantly correlated with fund performance. This study provides ultimate implications for fund management companies, when it comes to the efficient allocation of human capital. Fund management companies should focus more on the team-managed funds phenomenon, instead of on single-managed funds. Overall, this study provides significant guidance for the Malaysian Securities Commissions and fund management companies, to develop a more
competent funds market in Malaysia. Specifically, by strengthening the fund industry policies, the typical agency problems, such as too-high managerial expenses, and excessive risk-taking can be alleviated.

**Keywords**
Human capital, fund manager, fund characteristics, fund performance, expense ratio, turnover ratio, systematic risk

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Introduction
Mutual fund is an investment vehicle for investors to yield savings and diversification. The growth of fund investments has been astounding, not only in developed countries but also in emerging markets. The unit trust industry in Malaysia has experienced phenomenal positive growth in NAV of RM536.86 billion in April 2021, and the percentage of NAV to Bursa Malaysia market capitalization showed increasing trends, from 27.36 percent in 2011 to 29.20 percent in April 2021 (Securities Commission Malaysia, 2021). Nevertheless, this growth figure was rather low compared to other advanced and mature markets. The total net assets of mutual funds managed by US investment companies in April 2021 reached more than $25.5 trillion (USD) (Investment Company Institute, 2021), while European countries achieved $14,447.20 billion (EUR) in March, 2021 (European Central Bank, 2011). This indicates that the unit trust industry is still in the infancy stage in Malaysia.

Nevertheless, uncertainty and reduced stability in the global financial marketplace during the COVID-19 pandemic, have given rise to tremendous challenges in the fund industry. Investors have become impatient, especially with the underperformance of funds, putting them at odds with funds managers (William, 2017). Hence, investors are now not only focused on which funds perform better than others, but on who could persistently safeguard their investment portfolios during these turbulent periods. Hence, fund managers are expected to react faster and work under pressure in this competitive market to maintain and improve their positions (PWC, 2020). The investors pay great attention to who is delivering “alpha” in their investment portfolios. However, to date, no comprehensive study has examined the relationship of fund managers’ human capital characteristics with fund performance in Malaysia. Hence, this study proposes to integrate fund performances, managerial characteristics, systematic risk, expense ratio, and turnover ratio with single and simultaneous equations based on asset pricing models. This study attempts to fill this research gap. Therefore, the results are significant for the funds industry in emerging markets.

Literature review
Although there have been many empirical studies that found funds in Malaysia performed rather worse compared with mature markets (Low & Ghazali, 2007), more recent empirical studies showed the Malaysian fund performance has outperformed the market (Lai & Lau, 2010; Nur Adiana & Aminah, 2019; Razita, Ling & Rasidah, 2019). Previous studies (Atkinson et al., 2003; Bliss & Potter, 2002; Chevalier & Ellison, 1999; Golec, 1996) have focused on fund managers’ managerial characteristics by looking at fund performance. Lately, the Central Bank of Malaysia has been the driving force to develop human capital in the Malaysian banking industry (Bank Negara Malaysia, 2021). The changing landscape and transformation in the financial sector could be achieved by building the right quality of human capital (The Malaysian Reserve, 2021). The concept of human capital was developed in 1954 by William Arthur Lewis. Becker (1962) has expanded this theory, stating that “people cannot be separated from their knowledge, skills, health, or values in the way they can be separated from their financial and physical assets. Education, training, and health are the most important investments in human capital”.

Chevalier and Ellison (1999) highlighted that most investors believed that the mutual fund market had not yet achieved efficiency. Hence, fund managers who are actively involved with security selection and focused on movement in the market will not only add value to their investment portfolio, but will also produce superior performance (Low & Ghazali, 2007). Golec (1996) and Chevalier and Ellison (1999) examined that those fund managers who held a Master’s of Business Administration (MBA) degree showed positive to fund performance. This may be explained by the fact that the possession of an MBA degree equipped the fund managers with the skills related to investment risk management. Surprisingly, the absence of a Chartered Financial Analyst (CFA) title was not significantly relevant to the fund performance.

Golec (1996) highlighted that fund managers’ experience was negatively related to fund alpha. Younger fund managers had higher stamina and higher job prospects in their careers. Chen, Gao, Zhang, and Zhu (2018) examined that fund managers with prior industry analyst backgrounds showed significant stock selection ability. There is limited research that has investigated the role of fund managers’ gender on fund performance (Babalos, Caporale, & Philippas, 2015). Sargis and Wing (2018) investigated the fund performance of female fund managers. The finding indicated that male portfolio managers did not possess superior investment skills than their female counterparts. The results showed no significant difference in terms of fund performance between male and female fund managers.

Methods
This study sampled a total of 240 domestic equity funds in Malaysia to measure the risk-adjusted performance of each fund, from January 2012 to December 2014. To avoid survivor bias, the sample excluded funds that have ceased to exist in the Malaysian fund market, and data only hold survivors’ funds. The fund performance measurements were Jensen alpha on a single-factor model (CAPM) and alpha on a Fama and French (1993) (three-factor model). The FTSE KLCI
three-month Malaysian Treasury bill was chosen as a benchmark to proxy market indexes and risk-free rate of return. To address the simultaneous interactions among fund performance, systematic risk, expenses, and turnover, it is worth noting that Golec (1996) and Switzer and Huang (2007) performed single equations and simultaneous equations. Consistent with prior studies, this study performed single equations by using OLS regression and simultaneous equations estimation by 3SLS regression. STATA version 12.1 was used to conduct the statistical assessments.

All fund manager human capital data were obtained from secondary sources which are available for public access. The fund managers’ profiles, e.g., gender and education were retrieved, and hand-collected from each of the fund master prospectus and Morningstar; these data are under public access. Morningstar is a well-known Chicago-based financial services firm that provides in-depth analysis and rating system for fund performances and the fund managers investment experiences. Other human capital characteristics, e.g., investment experience and age data that are not publicly available in the Malaysian fund market, were obtained from a subscription to the Thomson One database and fund prospectus. In order to comply to the open data policy, the dataset was anonymised by attributing a number to each of the fund names; reviewers and readers may view and access the dataset without restrictions. Given that there is little and sometimes no available information on Malaysian fund managers’ age, to overcome this problem, Chevalier and Ellison (1999) and Atkinson, Baird, and Frye (2003) proposed an estimation of age by assuming that each fund manager was 21 years old upon graduation from college. Nevertheless, the average age of graduation for a Bachelor’s degree in Malaysia is approximately 24. Hence, this study estimated the fund managers’ age by adding 24 years to the number of years at work. Data on years of working experience were stated in the fund master prospectus. This research received approval number EA0372021 from the Research Ethic Committee of Multimedia University in Melaka, Malaysia.

Each of the fund managers’ human capital characteristic indicators were measured using a dummy variable, defined in Table 1. Furthermore, this study examined six fund characteristics in terms of their relationship with the fund performance (Switzer & Huang, 2007; Low, 2010). The fund characteristics data were sourced mainly from the respective fund master prospectus and annual reports of all fund management companies in Malaysia. To control the characteristics of the funds, the study classified the sample funds into two dimensions on the basis of the fund objective: growth fund and income fund dummy variables. The fund data are defined in Table 2.

Results and discussion

Table 3 reports descriptive statistics for fund performance, fund risks, and fund characteristics of the Malaysian funds industry. The average value shows a positive Jensen alpha of 0.0024, which indicates that fund managers possessed the best stock selection ability. However, there was a significant gap in the return performance between the best and worst

| Table 1. Fund managers’ human capital characteristics definition. |
|-----------------|-----------------|
| **Variables**   | **Measures**    |
| Education       | Business major degree = 1 |
|                  | Non-business major degree = 0. |
| Master’s degree | Master’s degree holders = 1 |
|                  | Without master’s degree = 0 |
| Professional certification | 'CFA, 'CFP or 'CPA designation = 1 |
|                  | Without professional certification = 0 |
| Gender          | Male = 1 |
|                  | Female = 0 |
| Race            | Bumiputra = 1 |
|                  | Non-bumi = 0 |
| Manager’s age   | Young (Less than or equal to 45 years) = 1 |
|                  | Senior (46 and above) = 0 |
| Investment experience | Investment experience (Tenure > 20 years) = 1 |
|                  | Investment experience (Tenure < 20 years) = 0 |
| Team managers   | More than one fund manager in a team = 1 |
|                  | Otherwise = 0 |
| Team gender     | Mix gender in team = 1 |
|                  | Otherwise = 0 |

'aCFA = Chartered financial analyst. 
bCFP = Certified financial planner. 
cCPA = Chartered financial analyst.
Fund managers. The average positive Alpha 2 of 0.0005 indicates that the funds slightly outperformed the market performance over the sampled period. The Beta of 0.5936 indicates that the mutual fund is relatively less risky than the market. The additional two risk factors, SMB with an average of 0.28 and HML was 0.56. Furthermore, the average value of the expense ratio was 1.8765 while the turnover ratio of sample funds was 1.0175 percent. The average fund had RM214.44 million in assets under management.

Table 2. Fund characteristics definition.

| Variables       | Measures                                                                 |
|-----------------|---------------------------------------------------------------------------|
| Turnover ratio  | [(Total acquisitions of the fund for the year + total disposal for the year)/2]/average net asset value for the fund for the year calculated on a daily basis |
| Expense ratio   | Fees and expenses incurred by the fund to the average value of the fund calculated on a daily basis |
| Fund objective  | High Growth/Growth fund = 1 Income fund = 0                                |
| Fund type       | Conventional fund = 1 Syariah fund = 0                                    |
| Fund size       | The logarithm of the firm’s asset size (in RM billion)                    |
| Fund age        | The number of years since the fund launched                               |

Table 3. Descriptive statistics of fund performance, fund risks and fund characteristics from January 2012 to December 2014.

| Variable        | Mean   | Standard deviation | Max    | Min    |
|-----------------|--------|--------------------|--------|--------|
| Fund performance|        |                    |        |        |
| Jensen alpha    | 0.0024 | 0.0122             | 0.0458 | -0.1184|
| Alpha 2         | 0.0005 | 0.0141             | 0.0750 | -0.1176|
| Fund risks      |        |                    |        |        |
| Beta            | 0.5936 | 0.8298             | 9.2251 | -2.4569|
| SMB             | 0.2841 | 0.2872             | 0.6239 | -0.0778|
| HML             | 0.5620 | 0.2773             | 0.8907 | 0.2135 |
| Fund characteristics |    |                    |        |        |
| Expense         | 1.8765 | 0.5668             | 8.6300 | 0.2600 |
| Turnover        | 1.0175 | 1.0773             | 14.1100| 0.0500 |
| Size ($ million)| 214.44 | 524.98             | 4214.91| 0.00   |
| Age (days)      | 4064.24| 3276.61            | 17067.00| 152.00 |

aFund performance measurements: Jensen alpha (single-factor model), Alpha on Fama & French three-factor model (Alpha 2).
bFund Risk Measurement: Beta, firm size (SMB), book-to-market value (HML).
cFund Characteristics: expense ratio (Expense), turnover ratio (Turnover), fund size (Size), age of the funds (Age).

fund managers. The average positive Alpha 2 of 0.0005 indicates that the funds slightly outperformed the market performance over the sampled period. The Beta of 0.5936 indicates that the mutual fund is relatively less risky than the market. The additional two risk factors, SMB with an average of 0.28 and HML was 0.56. Furthermore, the average value of the expense ratio was 1.8765 while the turnover ratio of sample funds was 1.0175 percent. The average fund had RM214.44 million in assets under management.

Table 4 reports the results among fund characteristics and human capital characteristics with the mutual fund performance (Jensen alpha) by using the CAPM single-factor index and alpha on Fama and French three-factor model on the single equation. The results showed that both fund performances were negatively related to fund expense, although only significant in Jensen alpha.

Fund age showed a positive correlation with both fund performances. This indicates that older funds generate higher returns. It is expected that older funds are more mature and established, and can keep the costs lower, which is in line with Gregory *et al.* (1997). On the other hand, the results revealed a significant, negative relationship between fund performances and fund managers’ possession of a business major degree and Master’s degree. Holding a Master’s degree
decreased the Jensen alpha, which indicates that fund managers with a Master’s degree did not add value to their portfolio performance and their stock-picking ability. This result is consistent with Switzer and Huang (2007).

The age of managers showed a positively significant impact on both fund performances. This is consistent with Gibbons and Murphy (1992). The senior managers who are approaching retirement avoid poor performance which may hurt fund manager’s reputation and reduce their job prospects in the future. The manager team showed a positive relationship with both of the fund performances. This suggests that funds managed by a team tend to benefit the mutual fund. This is consistent with Berkowitz and Qiu (2003). On the other hand, team gender showed a negative impact on fund performances. This indicates that mixed gender in a team underperformed.

Table 5 presents an integrated model of fund characteristics, human capital characteristics, and mutual fund performance, in a simultaneous equation model.

### Panel A: Fund performance regressions
Both fund performances (Jensen alpha and Alpha 2) were statistically significantly and negatively related to the expense ratio in the simultaneous equation. The fund managers who charge higher expense fees might reduce the fund alpha. This result is consistent with Golec (1996), Switzer and Huang (2007). The turnover ratio showed a positively significant relationship with Jensen’s alpha, which is consistent with Golec (1996). Moreover, the older funds produced better alpha.

The business major degree and Master’s degree both showed statistically significant relationships with Jensen alpha. Hence, the funds managed by fund managers with business degrees tend to increase the return. Consistent with Switzer and Huang (2007), fund managers with a Master’s degree slightly decreased the Jensen alpha. However, and surprisingly, a professional certification showed no significant influence on both fund performances. Fund managers with a long investment experience had a significantly negative impact on Jensen alpha. This indicates that fund managers with more than 20 years of investment experience do not perform better.
Table 5. 3SLS regression integrated model of fund performance: fund Performance, beta, expense, and turnover from January 2012 - December 2014 in the Malaysian mutual fund industry – simultaneous equation model.

| Endogenous variables | Panel A (fund performance) | Panel B [systematic risk (Beta), expense and turnover] |
|----------------------|---------------------------|-----------------------------------------------------|
|                      | Jensen alpha (CAPM single-factor) regressions | Alpha 2 (Fama & French three-factor) regressions | Beta regressions | Expense ratio regressions | Turnover ratio regressions |
|                      | Coef. | z-score | Coef. | z-score | Coef. | z-score | Coef. | z-score | Coef. | z-score |
| Intercept            | 0.0441 | 0.8900 | 0.0146 | 1.3400 | 0.2646 | 0.4200 | 0.8262 | 2.1200** | -0.2625 | -0.5800 |
| Expense (percent)    | -0.0415 | -2.5500** | -0.0128 | -2.6300*** | -0.1727 | -0.5200 | 0.8383 | 4.3800*** |
| Turnover (percent)   | 0.0277 | 2.2200** | 0.0102 | 1.2800 | -0.1727 | -0.5200 | 0.8383 | 4.3800*** |

| Exogenous variables  |                        |                                      |                        |                        |                        |
|----------------------|-------------------------|--------------------------------------|------------------------|------------------------|------------------------|
| Fund size ($ million) | 0.0000 | 0.9000 | 0.0000 | 0.4600 | 0.0001 | 0.9200 | 0.0001 | 1.8600* | -0.0001 | -2.9700*** |
| Fund age (year)      | 0.0000 | -2.4100** | 0.0000 | -2.8900*** | 0.0001 | 3.5900*** | 0.0000 | -4.4400*** | 0.0000 | 2.4600** |
| Fund objective       | 0.0063 | 0.7200 | -0.0020 | -1.9000 |                        |                        |                        |                        |                        |
| Fund types           |                        |                                      |                        |                        |                        |
| Education            | 0.0008 | 0.1000* | 0.0012 | 0.4600 | -0.3174 | -2.0400** | 0.0535 | 0.5600 | -0.1549 | -1.8200* |
| Master               | -0.0051 | -2.1700** | -0.0010 | -0.6000 | -0.1508 | -1.7400* | -0.1390 | -2.3200** | 0.1514 | 2.1900** |
| Certificate          | -0.0002 | -0.1400 | -0.0005 | -0.3600 | 0.2754 | 3.2600*** | 0.0128 | 0.2100 | -0.0055 | -0.0700 |
| Experience           | -0.0107 | -2.6900*** | -0.0035 | -1.4800 | -0.3590 | -2.9100*** | -0.2829 | -3.1900*** | 0.2408 | 2.0200** |
| Gender               | 0.0013 | -0.2700* | -0.0016 | -0.9500* | -0.1471 | -1.3900* | 0.0182 | 0.2400 | -0.0380 | -0.4200 |
| Race                 | 0.0002 | 0.0400 | 0.0000 | -0.0100 | 0.1920 | 1.5700 | 0.0728 | 0.8900 | -0.1255 | -1.4400 |
| Managers age         | 0.0129 | 2.2000** | 0.0070 | 3.0400*** | 0.2036 | 1.5900 | 0.2706 | 2.9800*** | -0.2141 | -1.7400* |
| Team manager         | 0.0157 | 1.8800* | 0.0074 | 1.3400 | 0.1248 | 0.8300 | 0.3753 | 1.6700* | -0.4441 | -1.7300* |
| Team gender          | -0.0002 | -0.0500 | -0.0016 | -0.9800 | 0.0164 | 0.1800 | 0.0566 | 0.9300 | -0.0954 | -1.4600 |

Dependent variable: Jensen alpha (CAPM single-factor), Alpha 2 (Fama & French three-factor model), Beta, Expense and Turnover ratio.
Notes: The asterisks ***and ** and * denote significance level at 1% and 5% and 10% respective.
Gender appeared to have a positive impact on Jensen alpha, which indicates that male managers were likely to slightly outperform. Additionally, manager age showed a positively significant effect in both of the fund performances. This indicates that senior fund managers had a longer tenure and thus better experience, which led them to generate better fund performance. In addition, the manager age was positively correlated with the fund manager’s experience tenure. On the other hand, team-managed funds showed a significant, positive relationship with Jensen alpha. This indicates that funds managed by more than one fund manager performed better than funds only managed by one.

Panel B: Beta, expense and turnover regressions

The fund age had a positive effect on systematic risk. This result is consistent with Golec (1996). This indicates that older funds are riskier than young funds. Business major and Master’s degree possession showed a statistically significant, negative effect when accounting for the simultaneity. On the other hand, investment experience showed a negative significant relationship with systematic risk. In addition, female fund managers held a higher systematic risk in their fund portfolio, which was consistent with Barber and Odean (2002) and Switzer and Huang (2007). Although professional certification did not show a significant effect in fund performance, it showed a significant, positive effect on beta regression. This indicates that the fund managers who have a professional certification hold higher-risk portfolios.

With regards to the expense regression, the turnover coefficient was positively significant, which is consistent with Golec (1996) and Switzer and Huang (2007). This means that increased trading activity by fund managers is related to higher-expense funds. Fund size has a positive effect on the expense regression, while fund age showed a negative impact on expense ratio. On the other hand, fund managers’ possession of a Master’s degree and longer tenure of investment experience showed a negative relationship with the expense ratio. Manager age showed a positive impact on expense ratio. Senior fund managers may require higher compensation than young managers.

With regards to turnover regression, the expense ratio positively affected the turnover ratio. This result is consistent with Switzer and Huang (2007). The higher trading activity may tend to have relatively higher expense costs. The funds with larger fund sizes always showed a more active trading, while fund age had a positive impact on turnover ratio. This indicates that older funds trade more frequently. The fund managers who had business degrees showed a negative impact on portfolio turnover. While fund managers’ in possession of a Master’s degree tended to trade more often. Investment experience was significantly positively related to turnover ratio. The age of the fund managers and team managers showed a negative correlation with turnover ratio. Fund managers below 45 years of age traded more often than senior fund managers. It can be concluded that there is an interrelationship among fund characteristics, human capital characteristics, and fund performance.

Conclusions

A substantial emphasis is placed on how human capital roles can affect the ultimate work performance of an individual. To date, very little attention has been devoted to seeking empirical evidence for the effects of human capital managerial characteristics especially in the funds industry. Hence, this study identified that fund managers’ education, gender, age, and team managers are significant characteristics in explaining fund performance. Hence, this study provides greater support for human capital theory (Becker, 1964). Although the findings showed that gender is a significant variable in explaining fund performance, the study was unable to provide clear evidence on whether female fund managers in Malaysia outperform their male counterparts. Hence, the relationship between gender and fund performance might need further investigation. To develop a more efficient and competent funds market and financial system, Malaysian regulators need to strengthen fund industry policies and practices, so that typical agency problems, such as excessive managerial expenses and risk-taking can be alleviated.

Data availability

Underlying data

Figshare: Venny Chong data, https://doi.org/10.6084/m9.figshare.14870556.11

This project contains the raw human capital, fund characteristics and fund performance data for Malaysia.

Data are available under the terms of the Creative Commons Zero “No rights reserved” data waiver (CC0 1.0 Public domain dedication).
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The paper investigates the effects of human capital and fund characteristics on mutual fund performance in Malaysia. It discusses risk-adjusted return, risk factors, and team-managed funds. Therefore, it is an interesting piece of work.

General conclusion

From my point of view, the study should be revised so that it can be modified better and make further contributions. More detailed comments and suggestions are listed as follows. I am totally willing to review a revised version of this paper if the authors correct and revise the paper based on my review.

1. The paper adopts Jensen alpha and alpha on a Fama and French (1993)\(^1\) to disentangle fund performance from risk and discuss the effect of risk factors. However, the principal-agent problem of mutual funds most relates to total risk (See, for example, Jorion, 2003, FAJ)\(^2\). So the paper can provide some examinations similar to Fang and Wang (2015, IAJ)\(^3\). It might find evidence about risk-taking under the framework of performance associated with total risk.

2. Team-managed fund decision is a very interesting topic. However, the paper should do more work. I think the test of fund manager effects of human capital and fund characteristics should be in a different framework. Team characteristics are more important.

3. In addition, we also can find one manager regulates several funds. The paper should also discuss the phenomenon.

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**Is the work clearly and accurately presented and does it cite the current literature?**
Partly

**Is the study design appropriate and is the work technically sound?**
Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**
Partly

**If applicable, is the statistical analysis and its interpretation appropriate?**
Partly

**Are all the source data underlying the results available to ensure full reproducibility?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Asset pricing, Financial market

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.
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