LONGER TENURE, GREATER SENIORITY, OR BOTH? EVIDENCE FROM OPEN-END EQUITY MUTUAL FUND MANAGERS IN TAIWAN

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ABSTRACT

In this paper, we investigate the relationship between a fund manager's characteristics and performance, focusing on the interrelationships among fund managers' tenure, seniority and performance in the Taiwan open-end equity mutual fund market. To our knowledge, this is the first study to look into the joint impact of tenure and seniority. By sorting managers both by tenure and seniority, we are able to estimate the extent to which the interaction between the two variables may impact performance. This study suggests that a manager who has been in charge of a fund more than 24.33 months tends to perform well. Moreover, increasing seniority is found to be associated with decreasing performance. This may be explained by the observation that managers with greater seniority also tend to be older, and advanced age negatively impacts performance. Therefore, fund managers with high tenure and low seniority may potentially give rise to better performance than their peers.

Keywords: tenure, seniority, performance, manager characteristics, fund features

INTRODUCTION

A considerable number of studies have so far identified three groups of variables that potentially give rise to observed differences in fund performance, including manager characteristics, fund features and market-related factors. During the past decade, the first group has been the focus of substantial research interest. This group of variables typically includes a manager's educational background, age and tenure. In this study, we add to the aforementioned group a new variable, Manager Seniority, which has hitherto received far less attention than Manager Tenure. Some researchers, for example, Golec (1996), who support Manager Tenure as a proxy for a manager's experience in managing a particular fund, have

argued that longer tenure leads to an improvement in fund performance. Lemak and Satish (1996), Golec (1996), Payne, Prather and Bertin (1999), and Philpot, Hearth and Rimbey (2000) reported similar results. However, a manager could conceivably manage more than one fund during his entire career and through these funds not only accumulate knowledge on how to manage them vis-à-vis the behaviour of capital markets, but also the skills to cope with a changing investing environment. It thus needs to be asked whether Manager Seniority would be a better proxy for manager experience, and better able to capture fund performance than Manager Tenure. One of the focal points of this paper is therefore to assess this new variable's relevance in aiding the manager selection decisions of investors.

In order to discern the individual influences of Manager Tenure and Manager Seniority on fund performance, we choose to include one of the two variables separately in the cross-sectional regression; we refer to this type of regression model as the "single-indicator model". In addition, we may suspect this pair of variables of exerting an influence on fund performance in a more complicated manner. Specifically, we are interested in the following questions: when Manager Tenure is kept constant, how would fund performance respond to variations in Manager Seniority, and vice versa? To answer these questions, we adopt Fama and French's (1992, 1993) double-sort procedure in order to identify variation in Manager Seniority that is not related to Manager Tenure. Termed the "double-indicator model" in the current study, this approach allows us to study the relative importance of the two variables simultaneously, as well as the possible ways in which the variables interact to impact performance.

In the single-indicator model, we find that both Manager Tenure and Manager Seniority positively affect fund performance. Increasing managerial longevity in a fund, as well as an extended career in the fund industry, will tend to enhance a manager's capability to produce superior performance. From the double-indicator model, we find that a consistently high Manager Tenure could predict better fund performance, as long as the length of tenure exceeds 24.33 months in Taiwan. Within the long-tenured manager group, longer seniority appears more like a liability than an asset, causing fund performance to decline as seniority increases.

A potential explanation for the observed interaction may be the effect of aging, which could diminish a manager's ability to cope with the demanding job of managing a fund. The implication is that Manager Seniority is a composite indicator, reflecting the positive effect of cumulative experience, as well as the detrimental effect of aging. By double-sorting managers along Manager Tenure and Seniority, we are able to extract the negative impact of aging on performance. This interpretation is consistent with the findings from previous studies. For

instance, a negative relationship between the manager's age and a fund's performance is documented in Chevalier and Ellison (1999), which remains negatively significant even after controlling for expense ratios that are positively related to the manager's age. Golec (1996) reported similar results. Our findings suggest that investors would be better off selecting funds with managers who have longer tenure and shorter seniority (i.e., are younger).

VARIABLE DEFINITIONS AND THE EMPIRICAL MODELS

As discussed above, the current study attempts to test the extent to which Manager Tenure and Manager Seniority account for the cross-sectional differences in fund performance, both individually as well as jointly. The distinct effect of each variable will be tested using the "single-indicator model", while their joint influence will be investigated via the "double-indicator model" that adopts the Fama-French (1992, 1993) double-sort procedure. Each of the models will be discussed in detail below.

Models with Tenure or Seniority Only (Single-Indicator Models)

The single-indicator is specified as follows:

$$
\begin{aligned}
RR_i, MAR_i, &\alpha\_J_i, SHARPE_i \\
&= C_i^1 + \beta_1^1 (TENURE \; or \;\; SENIORITY) + \beta_2^1 D\_MD_i + \beta_3^1 D\_FG_i \\
&\quad + \beta_4^1 F\_AGE_i + \beta_5^1 FEE\_M_i + \beta_6^1 LNSIZE_i + \beta_7^1 TURN_i \\
&\quad + \beta_8^1 D1_i + \beta_9^1 D2_i + \beta_{10}^1 D3_i + \beta_{11}^1 D4_i + \varepsilon_i^1
\end{aligned}
\tag{1}
$$

where the dependent variables on the left-hand side of equation (1) will be one of the following four performance measures: the raw return (RR), the market-adjusted return (MAR), Jensen's alpha (α_J) and the Sharpe ratio ($SHARPE$).[1] In our study, we run four regressions for each of the single- and double-indicator models, corresponding to the four performance measures.

The models from equation (1) contain two groups of explanatory variables: manager characteristics and fund features. The manager characteristics

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[1] The commonly-used performance measure is the raw return rate (RR). In addition, we use another performance measure referred to as the "market-adjusted return" (MAR), which is advanced by Goodwin (1998) as a preferred measure to Jensen's alpha (α_J), for its ability to capture a manager's ability to produce returns over the market by utilising proprietary information. This measure is calculated by subtracting the market return from a fund's raw return. The next commonly-used performance measure is Jensen's alpha. The Sharpe ratio ($SHARPE$) adjusts the excess return by the total risk of a fund.

considered in this study include Manager Tenure (*TENURE*), Manager Seniority (*SENIORITY*) and the possession of a master's degree (*D_MD*). We also include the possession of a foreign degree as another variable in measuring a manager's educational background (*D_FG*). The rationale is simple since managers with a degree obtained overseas should have better foreign language skills when it comes to accessing global information that is pertinent to fund management. At this point, it is worthwhile to explain the way educational background is measured in the current study, and how it differs from the literature. Most past studies, such as Golec (1996), create a dummy variable that is equal to 1 for managers with a master's degree or higher, and zero otherwise. However, it is conceivable that manager turnover could take place during the sample period, creating the situation in which successive managers of a particular fund may have different educational backgrounds. To reduce the potential for confusion that may arise from this type of situation, we resort to the approach discussed below. For each of the months in our sample period, we create a dummy variable similar to that in Golec (1996). We then compute the percentage of months during which a fund manager possesses a master's degree or higher. The percentage so calculated is then used in our regression models. The possession of a foreign degree is measured in a similar fashion.

Next, we turn to the fund's feature variables, which include the fund age (*F_AGE*), management fees (*FEE_M*), fund size (*LNSIZE*), fund turnover (*TURN*), and fund type (*D*1, *D*2, *D*3, *D*4 and *D*5). As for fund types, there are five types of funds in our sample: technology funds, specialty funds, mid-/small-cap funds, value funds and stock funds.[2] We create four dummy variables, *D*1, *D*2, *D*3 and *D*4, to represent the first four.

The variables are defined as follows: *RR* is the raw return for a fund, which is calculated as $RR_i = (NAV_{i,t} - NAV_{i,t-1})/NAV_{i,t-1}$, where NAV_i is the net asset value per share (*NAV*) for fund *i*. *MAR* is the market-adjusted return, calculated as $MAR_i = R_i - R_m$, where $R_m = (I_t - I_{t-1})/I_{t-1}$, and I_t is the closing value for the index. α_J is Jensen's alpha. *SHARPE is* Sharpe ratio, where *SHARPE* = (fund's monthly return − risk-free interest rate) divided by the standard deviation of the fund's returns. *TENURE* is the average number of months during which an individual manages a particular fund. *SENIORITY* is the average number of months the manager of a fund has been in the mutual fund industry. *D_MD* is the average percentage of months during which a fund is managed by a manager with a master's degree or higher. *D_FG* is the average percentage of months during which a fund is managed by a manager with a foreign degree. *F_AGE* is the

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[2] Fund categories are based on FundDJ.com, an internet website dedicated to mutual fund research in Taiwan. The site is currently advised by Professors Lee and Chiu from National Taiwan University.

average months of existence for a fund, ending in August 2006. *FEE_M* is the average management fee. *LNSIZE* is the natural logarithm of assets under management for a fund measured in millions of New Taiwan Dollars. *TURN* is the average portfolio turnovers for all funds, which is measured as the simple average of buy and sell turnover rates for a fund. *D1, D2, D3, D4* and *D5* represent the dummy variables for technology funds, specialty funds, small-/mid-cap funds, value funds and diversified stock funds, which equal 1 when a fund falls into this category and zero otherwise.

Models with Both Tenure and Seniority (Double-Indicator Models)

Equation (1) allows us to examine the distinct effects of Manager Tenure and Manager Seniority. As previously mentioned, we are also interested in learning how this pair of variables may interact to influence fund performance. However, the high correlation between the pair prevents us from including them in one single regression equation. We therefore adopt the Fama-French (1992, 1993) double-sort procedure to arrive at the "double-indicator model" as shown in equation (2) below:

$$
\begin{aligned}
RR_i &, MAR_i, \alpha\_J_i, SHARPE_i \\
&= C_i^2 + \beta_1^2 D\_HH_i + \beta_2^2 D\_HM_i + \beta_3^2 D\_HL_i + \beta_4^2 D\_MH_i \\
&\quad + \beta_5^2 D\_MM_i + \beta_6^2 D\_ML_i + \beta_7^2 D\_LH_i + \beta_8^2 D\_LM_i + \beta_9^2 D\_MD_i \\
&\quad + \beta_{10}^2 D\_FG_i + \beta_{11}^2 F\_AGE_i + \beta_{12}^2 FEE\_M_i + \beta_{13}^2 LNSIZE_i + \beta_{14}^2 TURN_i \\
&\quad + \beta_{15}^2 D1_i + \beta_{16}^2 D2_i + \beta_{17}^2 D3_i + \beta_{18}^2 D4_i + \varepsilon_i^2
\end{aligned} \tag{2}
$$

Unlike in equation (1), we do not directly employ the raw data for manager tenure and seniority in equation (2). Instead, we match the three manager tenure groups and three manager seniority groups to form nine different tenure-seniority combinations. In the double-indicator model, we first sort Manager Tenure and Manager Seniority, respectively, into three groups: High, Medium and Low. The Low Manager Tenure group consists of managers whose tenure is ranked in the bottom 30%, while the High Manager Tenure group contains the top 30%. The Manager Seniority groups are formed in a similar fashion. In our sample, the ranges for the three tenure groups are, from low to high, 7.50–14.29 months, 14.40–24.33 months and 24.33–88.00 months. For the three seniority groups, the ranges from low to high are 16.20–38.00 months, 38.50–56.00 months and 56.33–194.00 months. Referring to Table 1, *D_HH*, *D_HM* and *D_HL* refer to high tenure combined with high seniority, median seniority and low seniority, respectively, *D_MH*, *D_MM* and *D_ML* refer to median tenure combined with high seniority, median seniority and low seniority, *D_LH*, *D_LM* and *D_LL* refer to low tenure combined with high

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Table 1
The match of manager tenure and manager seniority.

Seniority	Tenure		
	High	Medium	Low
High	D_HH	D_MH	D_LH
Medium	D_HM	D_MM	D_LM
Low	D_HL	D_ML	

Note: TENURE is the average number of months during which a manager administers a particular fund. *SENIORITY* is the average number of months the manager of a fund has been in the mutual fund industry. *D_HH*, *D_HM* and *D_HL* refer to high tenure combined with high seniority, median seniority and low seniority respectively, *D_MH*, *D_MM* and *D_ML* refer to median tenure combined with high seniority, median seniority and low seniority, *D_LH*, *D_LM* and *D_LL* refer to low tenure combined with high seniority, median seniority and low seniority.

seniority, median seniority and low seniority. We then place managers in these nine groups. For instance, a manager who has been managing a particular fund for over 30 months, but has been in the fund industry for less than 38 months, will be placed in the High Tenure-Low Seniority group (*D_HL*). We then create 8 dummy variables to represent these tenure-seniority groups, and place them in the regression equation for the "double-indicator model". The other variables are described in the previous section.

Following Fama and French (1992, 1993), we report in a separate table the time series average of six yearly averages for the fund performance indicators for each of the nine groups in Table 2. In Table 2, for all performance indicators and in all years, we find that the average fund performance is highest in the category of *D_HL*; in other words, fund managers with higher tenure and lower seniority are associated with better performance.

Data Sources

The sample for the current study covers the 68-month period from January 2001 to August 2006, encompassing 122 Taiwan open-end stock funds. During this period, all of the 122 funds remained fully operational. Thus, the issue of survivorship bias, which is discussed in Malkiel (1995), should not be a concern for the current study. The data comes from two different sources. For fund age (*F_AGE*), fund type (*D*1/*D*2/*D*3/*D*4), the possession of a master's degree or higher (*D_MD*), the possession of a foreign degree (*D_FG*), Manager Tenure (*TENURE*) and Manager Seniority (*SENIORITY*), we obtain the data from FundDJ, which is an Internet site dedicated to mutual fund research in Taiwan. The data for the rest of the variables are obtained from the Taiwan Economic Journal (TEJ) mutual fund database.

Table 2
Average yearly return.

		D_HH	D_HM	D_HL	D_MH	D_MM	D_ML	D_LH	D_LM	D_LL
RR	2001	0.53	0.53	0.99	0.49	0.38	0.63	0.26	0.28	0.28
	2002	0.66	0.66	0.96	0.46	0.67	0.45	0.15	0.53	0.5
	2003	0.55	0.55	0.85	0.40	0.40	0.31	0.11	0.11	0.11
	2004	0.56	0.56	0.96	0.36	0.53	0.49	0.49	0.53	0.53
	2005	0.66	0.66	0.99	0.49	0.46	0.61	0.11	0.23	0.13
	2006	0.50	0.70	0.98	0.89	0.69	0.32	0.28	0.30	0.30
MAR	2001	0.13	0.43	0.82	0.40	0.32	0.32	0.12	0.16	0.26
	2002	0.11	0.58	0.98	0.29	0.49	0.42	0.13	0.21	0.25
	2003	0.11	0.36	0.75	0.36	0.30	0.36	0.12	0.22	0.26
	2004	0.09	0.28	0.65	0.45	0.42	0.32	0.12	0.24	0.25
	2005	0.19	0.60	0.98	0.28	0.38	0.38	0.12	0.18	0.1
	2006	0.02	0.72	0.89	0.72	0.52	0.20	0.09	0.29	0.1
α_J	2001	0.38	0.38	0.82	0.03	0.40	0.40	0.25	0.23	0.25
	2002	0.67	0.67	0.98	0.11	0.29	0.29	0.28	0.29	0.28
	2003	0.40	0.49	0.78	0.10	0.55	0.36	0.20	0.20	0.42
	2004	0.55	0.58	0.75	0.19	0.48	0.45	0.31	0.38	0.11
	2005	0.48	0.45	0.98	0.10	0.23	0.28	0.10	0.18	0.01
	2006	0.69	0.60	0.89	0.12	0.63	0.72	0.11	0.16	0.21
SHARPE	2001	0.13	0.12	0.18	0.02	0.05	0.01	0.02	0.08	0.06
	2002	0.11	0.13	0.23	0.05	0.04	0.03	0.04	0.04	0.06
	2003	0.11	0.12	0.12	0.02	0.06	0.05	0.02	0.08	0.02
	2004	0.09	0.12	0.15	0.02	0.03	0.04	0.04	0.04	0.06
	2005	0.19	0.12	0.02	0.10	0.10	0.06	0.08	0.01	0.08
	2006	0.02	0.09	0.09	0.06	0.04	0.08	0.08	0.02	0.06

Note: RR is the raw return for a fund. MAR is the market-adjusted return. α_J is Jensen's alpha. SHARPE is the Sharpe ratio, TENURE is the average number of months during which a manager runs a particular fund. D_HH, D_HM and D_HL refer to the high tenure combined with high seniority, median seniority and low seniority, D_MH, D_MM and D_ML refer to the median tenure combined with high seniority, median seniority and low seniority, D_LH, D_LM and D_LL refer to the low tenure combined with high seniority, median seniority and low seniority.

Descriptive Statistics and Correlations

The descriptive statistics for the variables in our models, except for the fund type and tenure-seniority dummies, are presented in Table 3. A first glance at the table shows that the averages for fund raw returns (*RR*), market-adjusted returns (*MAR*), Jensen's alpha (α_J) and the Sharpe ratio (*SHARPE*) are all positive during the sample period. A positive *MAR* average reflects the fact that, during this particular period, the average performance of the 122 funds in the sample beat the market index by a margin of 0.37% per month.

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Table 3
Descriptive statistics for quantitative variables.

	Variable	Mean	Median	Maximum	Minimum	S.D.	Observations
Fund Performance Measures	*RR* (%)	0.48	0.42	1.39	−0.28	0.40	8296
	MAR (%)	0.37	0.31	1.28	−0.39	0.40	8296
	a_J (%)	0.43	0.43	1.35	−0.67	0.42	8296
	SHARPE (%)	0.09	0.09	0.18	4.E-04	0.05	8296
Manager Characteristics	*TENURE* (months)	23.39	18.63	88.00	7.50	14.76	8296
	SENIORITY (months)	49.47	45.71	194.00	16.20	21.92	8296
	D_MD (%)	0.77	0.87	1.00	0.00	0.26	8296
	D_FG (%)	0.31	0.24	1.00	0.00	0.30	8296
Fund Features	*F_AGE* (months)	115.01	101.47	250.57	71.00	40.98	8296
	FEE_M (%)	0.13	0.13	0.15	0.06	0.01	8296
	SIZE (millions)	1740.00	1050.00	33800.00	81.44	0.003	8296
	TURN (%)	0.33	0.33	0.77	0.09	0.14	8296

Note: This table presents the summary statistics of each variable in our study. *RR* is the raw return for a fund. *MAR* is the market-adjusted return. α_J is Jensen's alpha. *SHARPE* is the Sharpe ratio, *TENURE* is the average number of months during which a manager manages a particular fund. *SENIORITY* is the average number of months the manager of a fund has been in the mutual fund industry. *D_MD* is the average percentage of months during which a fund is managed by a manager with a master's degree or higher. *D_FG* is the average percentage of months during which a fund is managed by a manager with a foreign degree. *F_AGE* is the average months of existence for a fund, ending in August 2006. *FEE_M* is the average management fee. *SIZE* is the assets under management for a fund measured in millions of New Taiwan dollars. *TURN* is the average portfolio turnover for all funds, which is measured as the simple average between buy and sell turnover rates for a fund.

For *TENURE*, the average in our sample is approximately 23 months, which is less than half of the average tenure for fund managers in the United States (US).[3] This phenomenon reflects higher manager turnover in Taiwan than in the US. As for *SENIORITY*, the sample average is 49 months, and ranges from 16 to 194 months. Although we cannot find similar figures for US managers, it is noted that the average manager seniority in Taiwan is still lower than the average tenure for US managers. These figures suggest that fund managers in Taiwan experience more frequent job changes and a shorter career than their US counterparts.

With respect to the percentage of months during which a fund is managed by a manager with advanced degrees (*D_MD*), the average is about 77%. The implication is that funds in Taiwan typically employ managers with at least a master's degree. On the contrary, only one out of three funds employs managers with a foreign degree (*D_FG*) in our sample.

Of the statistics for all dummy variables related to manager tenure-seniority combinations, the percentage of managers with both high tenure and high seniority is 18.03%, representing the largest group in our sample. Next, and in that order, come the medium tenure-medium seniority group (*D_MM*),

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[3] For comparison, the average manager tenures for Gottesman and Morey (2006), Chevalier and Ellison (1999) and Golec (1996) are 6 years, 4 years and 7 years, respectively; all of which exceed the average of 2 years for the managers in Taiwan.

Table 4
Correlation coefficient and VIF.

Panel A: Single-Indicator Model

(a) Correlation Coefficient

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
TENURE(1)	1.00											
SENIORITY(2)	0.71	1.00										
D_MD(3)	−0.07	−0.13	1.00									
D_FG(4)	−0.05	0.05	0.23	1.00								
F_AGE(5)	−0.12	0.08	−0.08	0.06	1.00							
FEE_M(6)	−0.07	−0.16	−0.01	−0.12	−0.55	1.00						
LNSIZE(7)	0.20	0.29	0.01	0.09	−0.11	−0.09	1.00	−				
TURN(8)	−0.09	−0.18	0.12	−0.11	−0.12	0.17	−0.57	1.00				
D1(9)	0.13	0.03	0.12	−0.11	−0.32	0.01	0.16	−0.11	1.00			
D2(10)	−0.02	−0.06	−0.13	−0.15	0.09	0.12	0.03	0.10	−0.09	1.00		
D3(11)	0.02	−0.02	0.02	−0.19	−0.12	−0.07	0.11	−0.02	−0.17	−0.05	1.00	
D4(12)	0.00	0.06	−0.13	0.03	−0.16	0.03	0.08	−0.04	−0.11	−0.03	−0.06	1.00

(b) VIF

		Dependent Variable					Dependent Variable			
		RR	*MAR*	*α_J*	*SHARPE*		*RR*	*MAR*	*α_J*	*SHARPE*
Independent Variables	*TENURE*			1.10		*SENIORITY*			1.15	
	D_MD			1.18		*D_MD*			1.19	
	D_FG			1.23		*D_FG*			1.24	
	F_AGE			2.52		*F_AGE*			2.51	
	FEE_M			1.61		*FEE_M*			1.59	
	LNSIZE			1.74		*LNSIZE*			1.79	
	TRUN			1.64		*TRUN*			1.64	
	D1			1.20		*D1*			1.20	
	D2			1.15		*D2*			1.15	
	D3			1.67		*D3*			1.67	
	D4			1.25		*D4*			1.25	

Table 4 *(continued)*

Panel B: Double-Indicators Model

Note: D_HH, *D_HM* and *D_HL* refer to the high tenure combined with high seniority, median seniority and low seniority, *D_MH*, *D_MM* and *D_ML* refer to the median tenure combined with high seniority, median seniority and low seniority, *D_LH* and *D_LM* refer to the low tenure combined with high seniority and median seniority. *F_AGE* is the average months of existence for a fund, ending in August 2006. *FEE_M* is the average management fee. *SIZE* is the assets under management for a fund measured in millions of New Taiwan Dollars. *TURN* is the average portfolio turnover for all funds, which is measured as the simple average between buy and sell turnover rates for a fund. *D*1, *D*2, *D*3, *D*4 and *D*5 represent the dummy variables for technology funds, specialty funds, small-/mid-cap funds, value funds and diversified stock funds.

(a) Correlation Coefficient

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
D_HH(1)	1																	
D_HM(2)	–0.14	1																
D_HL(3)	–0.09	–0.06	1															
D_MH(4)	–0.15	–0.09	–0.06	1														
D_MM(5)	–0.20	–0.13	–0.08	–0.14	1													
D_ML(6)	–0.20	–0.13	–0.08	–0.14	–0.18	1												
D_LH(7)	–0.07	–0.05	–0.03	–0.05	–0.07	–0.07	1											
D_LM(8)	–0.20	–0.13	–0.08	–0.14	–0.18	–0.18	–0.07	1										
D_MD(9)	–0.07	–0.15	0.09	–0.26	0.05	0.09	–0.01	0.13	1									
D_FG(10)	0.01	–0.14	–0.17	0.03	–0.05	0.03	–1.E–03	0.16	0.23	1								
F_AGE(11)	–0.03	0.02	–0.05	0.07	1.E–03	–0.12	0.01	0.16	–0.08	0.06	1							
FEE_M(12)	–0.18	0.02	0.01	–0.01	–0.01	0.12	0.05	0.02	–0.01	–0.12	–0.55	1						
LNSIZE(13)	0.26	–0.05	–0.06	0.12	–0.13	–0.16	0.01	0.03	0.01	0.09	–0.11	–0.09	1					
TURN(14)	–0.29	0.09	0.16	–0.12	0.08	0.19	–0.05	–0.10	0.12	–0.11	–0.12	0.17	–0.57	1				
*D*1(15)	0.03	–0.03	0.11	0.02	–0.19	0.12	–0.09	0.02	0.12	–0.11	–0.32	0.01	0.16	–0.11	1			
*D*2(16)	–0.07	0.15	–0.03	–0.05	0.08	0.08	–0.03	–0.07	–0.13	–0.15	0.09	0.12	0.04	0.10	–0.09	1		
*D*3(17)	0.17	–0.09	–0.06	–0.09	0.04	–0.05	–0.05	–0.13	0.02	–0.19	–0.12	–0.07	0.11	–0.02	–0.17	–0.05	1	
*D*4(18)	0.03	–0.06	–0.03	0.10	0.05	–0.08	–0.03	0.05	–0.13	0.03	–0.16	0.03	0.08	–0.04	–0.11	–0.03	–0.06	1

Table 4 *(continued)*

(b) VIF

		Dependent Variable			
		RR	*MAR*	*α_J*	*SHARPE*
Independent Variables	D_HH			2.36	
	D_HM			1.68	
	D_HL			1.34	
	D_MH			1.86	
	D_MM			2.12	
	D_ML			2.06	
	D_LH			1.29	
	D_LM			2.27	
	D_MD			1.33	
	D_FG			1.32	
	F_AGE			2.74	
	FEE_M			1.72	
	LNSIZE			1.77	
	TURN			1.77	
	D1			1.25	
	D2			1.20	
	D3			1.78	
	D4			1.37	

medium tenure-low seniority group (*D_ML*) and low tenure-medium seniority group (*D_LM*), representing 15.57% of the sample. For fund types, about 61.48% of the funds are diversified stock funds (*D*5), with technology funds representing the next largest group with 24.59% of the sample. The former group adopts a generalist approach to stock investing, while the latter specialises in picking technology stocks.

In Table 4 we show the interrelationship among the explanatory variables. As for the correlation coefficients and variance inflation factors (hereafter, VIF) among the variables, we find that none of the correlation coefficients exceed 0.7, which implies that there is no high degree of correlation among the independent variables, and none of the VIFs exceed 10, which also implies that there is no high degree of correlation among the independent variables.

11

EMPIRICAL RESULTS AND ANALYSIS

Results for the Single-Indicator Model

The empirical results for the single-indicator model are presented in Table 5. Regardless of which of the four performance measures is represented in the models, *TENURE* always has a significant and positive impact on fund performance. The implication is that, the longer a manager stays with a particular fund, the better the fund's performance will be. Similar results are obtained for *SENIORITY*. Therefore, longer manager seniority within the fund management industry should contribute to better fund results. As for the possession of a post bachelor's degree (*D_MD*) or a foreign degree (*D_FG*), neither has a significant influence on fund performance.

Next, we turn to the results for fund feature variables. Among the variables we have selected for this group, the regression coefficients associated with fund turnover (*TURN*), fund size (*LNSIZE*) and small-/mid-cap funds (*D3*) are all positively significant. The results for fund turnover are consistent with Chevalier and Ellison (1999), Friend, Blume and Crockett (1970) and Wermers (2000), while those for fund size agree with Golec (1996), Payne, Prather and Bertin (1999), and Shukla and van Inwegen (1995). But Prather, Bertin and Henker (2004) suggest that the relationship between the fund turnover rate and fund performance is positive but insignificant. Therefore, other things being equal, more active trading by a fund manager, as well as having more assets under management, will result in the fund on average outperforming other funds where trading is less active or where there are fewer assets under management. The latter evidence tends to support the argument for economies of scale as fund assets grow. The positive results for small-/mid-cap stock funds indicate that, even after risk adjustment, small-/mid-cap funds in Taiwan still outperform their large-cap counterparts. The other fund feature variables do not have a significant influence on fund performance, including the age of the fund (*F_AGE*) and the fund management fee (*FEE_M*). The other fund type variables for technology funds (*D1*), specialty funds (*D2*) and value funds (*D4*) do not explain the cross-sectional variations in fund performance, regardless of the type of performance measures. Thus, there is no discernable difference between different categories of funds.

Table 5
Empirical results for the single-indicator model.

Independent Variables		Dependent Variables						
		RR		MAR		α_J		SHARPE
Manager Characteristics	C	−2.09	−1.99	−2.21	−2.11	−2.46	−2.32	−0.24	−0.23
		(−1.69)[a]	(−1.56)	(−1.79)[a]	(−1.65)[a]	(−1.84)[a]	(−1.69)[a]	(−1.52)	(−1.40)
	TENURE	0.02		0.01		0.01		8.E−04	
		(3.06)[c]		(3.02)[c]		(2.92)[c]		(2.71)[c]	
	SENIORITY		5.E−03		3.E−03		3.E−03		3.E−04
			(1.70)[a]		(1.68)[a]		(1.90)[a]		(1.64)[a]
	D_MD	−0.07	−0.08	−0.06	−0.07	−0.05	−0.04	−0.01	−0.02
		(−0.50)	(−0.59)	(−0.50)	(−0.54)	(−0.32)	(−0.33)	(−0.33)	(−0.44)
	D_FG	0.04	0.02	0.03	0.01	0.01	−0.02	0.01	3.E−03
		(0.40)	(0.20)	(0.30)	(0.10)	(0.08)	(−0.12)	(0.39)	(0.21)
Fund Features	F_AGE	8.E−04	9.E−05	7.E−04	8.E−05	6.E−04	−1.E−04	2.E−04	8.E−05
		(0.69)	(0.77)	(0.59)	(0.06)	(0.45)	(−0.08)	(0.97)	(0.48)
	FEE_M	−2.64	−3.84	−2.74	−3.74	−2.54	−3.53	−0.17	−0.28
		(−0.77)	(−1.26)	(−0.87)	(−1.16)	(−0.74)	(−1.02)	(−0.43)	(−0.70)
	LNSIZE	0.15	0.16	0.15	0.13	0.16	0.14	0.02	0.03
		(3.04)[c]	(2.99)[c]	(3.04)[c]	(2.99)[c]	(3.03)[c]	(2.93)[c]	(2.74)[c]	(2.69)[c]
	TURN	1.07	1.09	1.06	1.08	1.03	1.04	0.10	0.10
		(3.77)[c]	(3.79)[c]	(2.77)[c]	(3.72)[c]	(3.35)[c]	(3.32)[c]	(2.85)[c]	(2.83)[c]
	D1	−0.06	−0.05	−0.06	−0.03	−0.01	−4.E−05	−2.E−03	−6.E−04
		(−0.67)	(−0.52)	(−0.67)	(−0.52)	(−0.10)	(−5.E−04)	(−0.16)	(−0.05)
	D2	0.22	0.23	0.21	0.24	0.27	0.28	0.03	0.04
		(1.03)	(1.08)	(1.03)	(1.08)	(1.14)	(1.19)	(1.21)	(1.25)
	D3	0.21	0.22	0.21	0.23	0.30	0.31	0.03	0.03
		(1.71)[a]	(1.70)[a]	(1.71)[a]	(1.72)[a]	(2.24)[b]	(2.22)[b]	(1.87)[a]	(1.87)[a]
	D4	0.30	0.26	0.31	0.28	0.24	0.20	0.04	0.03
		(1.67)[a]	(1.44)	(1.67)[a]	(1.44)	(1.18)	(0.95)	(1.72)[a]	(1.50)
	R^2	33.36%	33.34%	33.35%	33.33%	33.62%	33.63%	26.30%	26.24%
	Durbin-Watson Statistic	1.98	1.97	1.98	1.96	2.05	2.04	2.20	2.19
	Jarque-Bera	0.31	0.34	0.31	0.33	6.05	6.12	3.86	3.85
		(0.81)	(0.85)	(0.81)	(0.85)	(1.15)	(1.05)	(0.14)	(0.15)

Notes: The table presents regression results of the single-indicator model. The dependent variable is the fund performance indicators (*RR, MAR, α_J and SHARPE*), and the independent variables including the Manager Characteristics (*TENURE* is the average number of months during which a manager manages a particular fund, *SENIORITY* is the average number of months the manager of a fund has been in the mutual fund industry, *D_MD* is the average percentage of months during which a fund is managed by a manager with a master's degree or higher, *D_FG* is the average percentage of months during which a fund is managed by a manager with a foreign degree) and Fund Features (*F_AGE* is the average months of existence for a fund, ending in August 2006. *FEE_M* is the average management fee. *LNSIZE* is the natural logarithm of assets under management for a fund measured in millions of New Taiwan Dollars. *TURN* is the average portfolio turnover for all funds, which is measured as the simple average between buy and sell turnover rates for a fund, *D1, D2, D3* and *D4* represent the dummy variables for technology funds, specialty funds, small- /mid-cap funds, value funds and diversified stock funds). The associated t statistics displayed in the parentheses. Figures marked with a, b and c are statistically significant at the 10%, 5% and 1% levels, respectively.

Results for the Double-Indicator Model

The results for the double-indicator model are presented in Table 6. The regression coefficients associated with the tenure-seniority dummy variables exhibit an interesting pattern. For low tenure groups, the influence of seniority on fund performance is insignificant and indeterminate. For medium tenure groups, seniority starts to exert its influence on fund performance, with low to medium seniority contributing positively to fund performance at the 10% confidence level, when the fund performance measure is either Jensen's alpha or the Sharpe ratio. For high tenure groups, all levels of seniority (Low, Medium and High) have a positive and significant influence on fund performance, regardless of the fund performance measures. Nevertheless, the influence of seniority over the three high tenure groups appears to diminish as manager seniority increases. These patterns suggest that as the tenure for a fund manager increases beyond a certain threshold, which is approximately 24.33 months in our data, the fund's performance tends to improve. A reasonable explanation may be the manager is becoming increasingly familiar with the fund's operations, and the lead time it takes for a new manager to readjust the fund's portfolio.

In order to further clarify the relationship between tenure and seniority, as well as their joint impact on fund performance, we rearrange the empirical results shown in Table 5 from the low to high seniority groups, so that we can observe the relationship between tenure and fund performance after controlling for seniority. The primary purpose behind this exercise is to discern the relative importance of tenure and seniority in explaining fund performance. The results are shown in Table 6, Panel A1.

When the regression coefficients associated with the tenure-seniority dummies are ranked by seniority from low to high, no obvious pattern emerges except that higher tenure groups across the spectrum of seniority always contribute positively and significantly to fund performance. We conclude that manager tenure is a better predictor of fund performance than seniority, and that the impact of the latter tends to disappear after the effect of tenure is accounted for.

In addition, we are also interested in determining whether investors can utilise the information related to the fund managers' tenure and seniority to predict, and ultimately select, better-performing funds. According to Table 5, across all tenure categories, high-tenure groups always contribute positively to fund performance, implying that high tenure is a good predictor in that regard.

Table 6

Empirical results for the double-indicator model.

Notes: This table shows the regression coefficients for all explanatory variables with their associated t statistics displayed in the parentheses. Figures marked with a, b and c are statistically significant at the 10%, 5% and 1% levels, respectively. *D_HH*, *D_HM* and *D_HL* refer to the high tenure combined with high seniority, median seniority and low seniority, *D_MH*, *D_MM* and *D_ML* refer to the median tenure combined with high seniority, median seniority and low seniority, *D_LH* and *D_LM* refer to the low tenure combined with high seniority and median seniority. *F_AGE* is the average months of existence for a fund, ending in August 2006. *FEE_M* is the average management fee. *SIZE* is the assets under management for a fund measured in millions of New Taiwan Dollars. *TURN* is the average portfolio turnover for all funds, which is measured as the simple average between buy and sell turnover rates for a fund. *D1*, *D2*, *D3*, *D4* and *D5* represent the dummy variables for technology funds, specialty funds, small- /mid-cap funds, value funds and diversified stock funds.

Independent Variables			Dependent Variables				Independent Variables	Dependent Variables			
			RR	*MAR*	*α_J*	*SHARPE*		*RR*	*MAR*	*α_J*	*SHARPE*
		C	−2.45	−2.56	−2.97	−0.30	*F_AGE*	5.E−04	5.E−04	2.E−04	8.E−05
			$(-1.92)^a$	$(-2.01)^b$	$(-2.15)^b$	$(-1.86)^a$		(0.41)	(0.41)	(0.12)	(0.51)
Manager Characteristics	Low Tenure	*D_LH*	−0.08	−0.08	0.02	4.E−03	*FEE_M*	−2.70	−2.70	−2.97	−0.26
			(−0.32)	(−0.32)	(0.27)	(0.29)		(−0.82)	(−0.82)	(−0.83)	(−0.61)
		D_LM	−4.E−04	−4.E−04	0.07	0.02	*LNSIZE*	0.16	0.16	0.17	0.02
			(0.39)	(0.39)	(1.05)	(1.41)		$(3.27)^c$	$(3.27)^c$	$(3.31)^c$	$(3.09)^c$
	Medium Tenure	*D_MH*	−0.04	−0.04	−0.02	0.00	*TURN*	1.02	1.02	1.02	0.10
			(1.26)	(1.26)	(1.62)	(1.28)		$(3.43)^c$	$(3.43)^c$	$(3.16)^c$	$(2.71)^c$
		D_ML	−0.07	−0.07	0.00	0.01	*D1*	−0.04	−0.04	0.01	−2.E−04
			(1.08)	(1.08)	$(1.89)^a$	$(1.80)^a$		(−0.44)	(−0.44)	(0.07)	(−0.02)
	High Tenure	*D_HH*	0.19	0.19	0.17	0.18	*D2*	0.20	0.20	0.23	0.03
			$(1.69)^a$	$(1.69)^a$	$(2.22)^b$	$(2.05)^b$		(0.92)	(0.92)	(0.97)	(1.09)
		D_HM	0.26	0.25	0.26	0.22	*D3*	0.30	0.30	0.22	0.04
			$(2.00)^b$	$(2.00)^b$	$(2.36)^b$	$(2.07)^b$		(1.58)	(1.58)	(1.06)	(1.55)
		D_HL	0.28	0.28	0.26	0.05	*D4*	0.33	0.33	0.40	0.42
			$(2.93)^c$	$(2.93)^c$	$(2.89)^c$	$(3.18)^c$		$(2.83)^c$	$(2.83)^c$	$(3.31)^c$	$(2.58)^c$
		D_MD	−0.07	−0.07	−0.06	−0.02	R^2	37.10%	37.10%	36.78%	31.91%
			(−0.50)	(−0.50)	(−0.37)	(−0.91)	Durbin–Watson statistic	1.92	1.92	2.03	2.15
		D_FG	0.11	0.11	0.07	0.01	Jarque–Bera	0.33	0.33	4.31	2.07
			(0.87)	(0.87)	(0.54)	(0.85)		(0.85)	(0.85)	(0.12)	(0.36)

(Continued on next page)

Table 6 *(continued)*

Panel A1

Independent Variables		Dependent Variables			
		RR	*MAR*	α_J	*SHARPE*
Low Seniority	*D_HL*	0.28	0.28	0.26	0.05
		$(2.93)^c$	$(2.93)^c$	$(2.89)^c$	$(3.18)^c$
	D_ML	–0.07	–0.07	0.00	0.01
		(1.08)	(1.08)	$(1.89)^a$	$(1.80)^a$
Medium Seniority	*D_HM*	0.26	0.25	0.26	0.22
		$(2.00)^b$	$(2.00)^b$	$(2.36)^b$	$(2.07)^b$
	D_MM	0.05	0.05	0.03	0.01
		(1.43)	(1.43)	$(1.85)^a$	$(1.86)^a$
	D_LM	–4.E–04	–4.E–04	0.07	0.02
		(0.39)	(0.39)	(1.05)	(1.41)
High Seniority	*D_HH*	0.19	0.19	0.17	0.18
		$(1.69)^a$	$(1.69)^a$	$(2.22)^b$	$(2.05)^b$
	D_MH	–0.04	–0.04	–0.02	0.00
		(1.26)	(1.26)	(1.62)	(1.28)
	D_LH	–0.08	–0.08	0.02	0.00
		(–0.32)	(–0.32)	(0.27)	(0.29)

Furthermore, it is worth noting that, within the high–tenure groups, seniority exhibits a diminishing effect on fund performance. For instance, from the results for raw returns, the regression coefficients associated with *D_HL*, *D_HM* and *D_HH* are 0.61, 0.30 and 0.22, respectively. The diminishing pattern noted above is apparent from this set of coefficients. The same patterns hold for the results associated with the other three fund performance measures. Therefore, given high manager tenure, seniority and tenure tend to exhibit a negative relationship. These patterns suggest the following potential investment recommendation for investors: Select managers with high tenure first, and then choose those with low seniority from this subset. This approach should enable one to pick a group of managers with superior performance. In our sample, the threshold for manager tenure is 24.33 months.

The empirical results discussed so far prompt us to explore their possible explanations. In particular, we are interested in further analyzing two aspects of our findings: (a) Why does the influence of seniority on fund performance disappear as the former increases? (b) Within the high-tenure category, why does seniority exhibit a negative relationship with fund performance? We seek to answer these questions by examining the performance data. Following Fama and French (1992, 1993), we first rank managers into low, medium and high categories based on their tenures and seniority, then place them into nine tenure-seniority categories, and then calculate the average performance for each. We do this for the four different performance measures. The results are shown in Table 6.

From Table 7, we observe that the average fund performance increases with manager tenure, and the same pattern holds for all the performance measures employed in this study. For instance, the raw returns for the low, medium and high tenure groups are 0.31%, 0.45% and 0.96%, respectively. However, manager seniority does not exhibit any consistent pattern. The only seniority-related pattern emerges from the high-tenure group, where the average fund returns are monotonically diminishing as manager seniority increases. For instance, the raw returns for the low, medium and high seniority groups within the high-tenure category are 0.96%, 0.61% and 0.58%, respectively.

Table 7
Joint impacts of manager tenure and career seniority.

		Average RR					Average MAR		
		SENIORITY					SENIORITY		
		L	M	H			L	M	H
	L	0.31	0.33	0.23		L	0.20	0.22	0.11
TENURE	M	0.45	0.52	0.52	TENURE	M	0.33	0.41	0.41
	H	0.96	0.61	0.58		H	0.85	0.50	0.47
		Average α_J					Average SHARPE		
		SENIORITY					SENIORITY		
		L	M	H			L	M	H
	L	0.21	0.29	0.21		L	0.06	0.08	0.06
TENURE	M	0.44	0.45	0.46	TENURE	M	0.09	0.09	0.09
	H	0.88	0.56	0.56		H	0.14	0.10	0.10

Notes: This table presents as the average *RR*, *MAR*, α_J and *SHARPE* in different level of *SENIORITY* and *TENURE*. Note: *RR* is the raw return for a fund. *MAR* is the market–adjusted return. α_J is Jensen's alpha. *SHARPE* is the Sharpe ratio, *TENURE* is the average number of months during which a manager manages a particular fund. *D_HH*, *D_HM* and *D_HL* refer to the high tenure combined with high seniority, median seniority and low seniority, *D_MH*, *D_MM* and *D_ML* refer to the median tenure combined with high seniority, median seniority and low seniority, *D_LH* and *D_LM* refer to the low tenure combined with high seniority and median seniority.

Given the results from Tables 5 and 6, our next step is to gain some insights from the literature to explain the potential causes behind the aforementioned patterns. Golec (1996) and Gottesman and Morey (2006) find a negative relationship between manager age and fund performance. In our sample, the correlation between manager age and manager seniority is as high as 0.68. Although we do find a positive relationship between manager seniority and fund performance in the single-indicator models, this relationship is weakened as a manager grows older. Consequently, as seniority increases, the negative effect associated with fund performance starts to set in, which offsets the positive influence of seniority.

The above analysis yields some insights into how an investor may select fund managers to achieve better results. Although fund performance will improve with increasing manager tenure, managers with high career seniority will start to feel the impact of aging. Therefore, investors may want to choose high-tenure managers less seniority for superior investment results.

We now turn our attention to Table 6, in which the results for the fund feature variables are presented. We find that fund turnover (*TURN*), fund size (*LNSIZE*) and small-/mid-cap funds (*D*3) all have a significantly positive impact on fund performance. Other fund feature variables, including the management fee (*FEE_M*), technology fund (*D*1), specialty fund (*D*2) and value fund (*D*4), do not explain the variation in fund returns. These results are consistent with those for the single-indicator model.

CONCLUSION

This paper investigates the influences that both manager tenure and career seniority may exert on fund performance. In order to address the potentially complicated ways by which these two variables affect a fund's performance, the current paper employs two different model specifications to identify the relative importance of manager tenure and career seniority amongst Taiwan mutual funds. The single-indicator model includes either manager tenure or career seniority, along with other manager characteristics and fund features, as one of the explanatory variables for fund performance. The double-indicator model, which adopts the Fama-French double-sort procedure (1992, 1993), forms nine tenure-seniority groups, and uses the dummy variables representing these groups as the new explanatory variables to replace the raw data for manager tenure and career seniority.

For the single-indicator model, this study finds that both manager tenure and career seniority have a positive and significant impact on the fund

performance of a Taiwanese open-ended mutual fund. The implication is that, as a manager continues to accumulate tenure and career seniority, the managed fund tends to perform better than those whose managers are relatively new to a fund and the fund management industry. The results from the double-indicator model further indicate the following: (1) fund performance is monotonically increasing with manager tenure; (2) within the high-tenure group, fund performance is monotonically decreasing with career seniority. The threshold for manager tenure is 24.33 months, meaning that a fund with a manager who has been overseeing that fund for more than 24.33 months will tend to see better performance than a fund where the manager does not have such long tenure.

As for the reason behind the inverse relationship between career seniority and fund performance for the high-tenure group, we find that a manager's career seniority is positively related to his/her age, and the latter tends to exhibit a negative effect on fund performance. Therefore, within the high-tenure category, the negative influence of high career seniority starts to eat into the benefit inherent in having a manager with long tenure. Based on our findings, a potential recommendation for investors seeking to pick better-performing funds in Taiwan will be to select managers based on tenure first, and then to filter out those with high career seniority.

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