

CHAPTER 5

EMPIRICAL RESULTS AND DISCUSSION

5.1 Introduction

The objective of this thesis is to examine the impact of fund family attributes on fund family performance and flows. This is first examined through the analysis of the fund family performance by exploring the selectivity skills and market timing ability of fund family managers, then analysis of the impact of star and poor funds on the fund family performance, and testing the fund family performance persistence. Second, investors' behaviour is explored through the analysis of star phenomenon; first the effect on overall fund family flows. Second, the spillover effects "Islamic and conventional star funds". Finally, analysis of the future performance of star fund family, and then analysis of the fund family's star holding persistency. This chapter reports and discusses the research findings of the thesis. This thesis applied the analysis on two sample. First, the analysis of overall fund family sample including individual country. Second, the analysis of the Islamic and conventional focused families (IFF Vs CFF).

5.2 Fund Family Performance

This section presents the results of the fund family performance analysis. It reports the findings related to the research question one, which addresses three hypotheses related to fund family performance. Section 5.2.1 presents the descriptive statistics. Section 5.2.2 presents the selectivity skills models. Section 5.2.3 presents the market timing ability. Section 5.2.4 presents the fund family performance and star

(poor) funds. Section 5.2.5 presents fund family persistence. Section 5.2.6 summarizes and discusses the findings.

5.2.1 Descriptive Statistics

This sub-section shows the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. The results show H_0 : constant variance, which means there is no heteroscedasticity, and $\text{prob} > \chi^2$ is 0.071; more than 0.05 suggests that the null hypothesis cannot be rejected. Given the potential problems of multicollinearity among the fund family attributes variables, a diagnostic check was performed using variance inflation factors (VIFs). As a rule of thumb, a $VIF > 10$ is taken as an indicator of the presence of multicollinearity. The diagnostic results show that none of the variables have a value greater than 10, which suggests that there is no multicollinearity.

Table 5.1: Breusch-Pagan/ Cook-Weisberg and VIF Test

Variables	VIF	1/ VIF	Heteroscedasticity test
FTSE Islamic	1.66	0.7134	H0: Constant variance Prob > Chi2 = 0.071
FTSE All World	1.52	0.7717	
SMB	1.41	0.8770	
HML	1.72	0.8866	
MOM	2.54	0.9593	
TB	1.77	0.8954	
Mean VIF	1.77	-----	

This sub-section also reports the descriptive statistics of the overall fund family, Islamic focused family (IFF), and conventional focused family (CFF) for the four countries under study, in addition to the market benchmarks returns, and other risk factors. Table 5.2 shows that the overall, all the fund families in Saudi Arabia, Malaysia, Indonesia, and Pakistan report positive average raw returns 0.2742 as well as excess fund family returns 0.2062. Both market benchmarks report positive mean returns 0.0032 for the FTSE Islamic and 0.0075 for the FTSE All World. Observation by

countries shows that, on average, Saudi Arabia reports the highest fund family raw returns, which are 0.5373 percent and excess returns 0.4683, while Malaysia reports average raw returns of 0.2452 and excess returns of 0.2162. Pakistan reports, on average, the lowest average raw returns 0.1373 and excess returns 0.0283, while Indonesia reports 0.2391 fund family raw return and excess returns of 0.1681. Indonesia has the highest return volatility 0.442, followed by Pakistan 0.425, Saudi Arabia 0.342, and Malaysia 0.237. This indicates that the risk is higher in Indonesia and the lowest in Malaysia.

This section also describes the descriptive statistics of the IFF compared to the CFF for all countries and by country. Since the sample of fund families in Saudi Arabia are all focused on Islamic mutual funds (IMFs), this section excludes Saudi Arabia in the comparison descriptive analysis. On average, for all countries, the IFF reports higher raw returns 0.2402 and excess returns 0.1722 compared to the CFF raw returns 0.1343 and excess returns 0.0663. This implies that, collectively for all countries, IFF average raw return performance is better than CFF return performance.

Table 5.2: Descriptive Statistics

Country	Fund Family		IFF		CFF		Equality of variance		Equality of means			
	N	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>		
Malaysia	No. of funds	170	165.5 (3.304)	75	71.7 (8.562)	95	88.6 (1.258)	1.426	0.084	4.591	0.000	
	No. of families	20	17.9 (1.552)	8	7.71 (1.132)	12	11.5 (1.865)	1.453	0.080	2.933	0.000	
	Raw return	2880	0.2452 (0.237)	1152	0.1533 (0.333)	1728	0.1355 (0.407)	1.340	0.090	1.586	0.040	
	Excess return	2880	0.2162 (0.367)	1152	0.1243 (0.337)	1728	0.1065 (0.406)	1.574	0.058	0.066	0.047	
	FTSE	2880	0.0032 (0.057)	1152	0.0032 (0.057)	1728	0.0032 (0.057)	--	--	--	--	
	Islamic	2880	0.0075 (0.063)	1152	0.0075 (0.063)	1728	0.0075 (0.063)	--	--	--	--	
	FTSE all world	2880	-0.080 (0.281)	1152	-0.0801 (0.281)	1728	-0.0801 (0.281)	--	--	--	--	
	SMB	2880	0.0460 (0.267)	1152	0.0460 (0.267)	1728	0.0460 (0.267)	--	--	--	--	
	HML	2880	-0.019 (0.519)	1152	-0.0190 (0.519)	1728	-0.0190 (0.519)	--	--	--	--	
	MOM	2880	0.0290 (0.027)	1152	0.0290 (0.027)	1728	0.0290 (0.027)	--	--	--	--	
	TB	2880	79.3 (2.718)	34	30.6 (6.006)	49	47.5 (3.175)	5.339	0.000	5.668	0.000	
	Indonesia	No. of funds	14	13.3 (1.374)	5	4.78 (1.179)	9	8.51 (1.118)	4.424	0.000	4.282	0.000
		No. of families	2016	0.2391 (0.442)	720	0.1432 (0.504)	1296	0.1422 (0.437)	0.435	0.000	0.601	0.000
		Raw return	2016	0.1681 (0.485)	720	0.0722 (0.503)	1296	0.0712 (0.438)	0.425	0.000	0.600	0.000
Excess return		2016	0.0032 (0.057)	720	0.0032 (0.057)	1296	0.0032 (0.057)	--	--	--	--	
FTSE		2016	0.0075 (0.063)	720	0.0075 (0.063)	1296	0.0075 (0.063)	--	--	--	--	
Islamic		2016	-0.080 (0.281)	720	-0.0801 (0.281)	1296	-0.0801 (0.281)	--	--	--	--	
FTSE all world		2016	0.0460 (0.267)	720	0.0460 (0.267)	1296	0.0460 (0.267)	--	--	--	--	
SMB		2016	-0.0190 (0.519)	720	-0.0190 (0.519)	1296	-0.0190 (0.519)	--	--	--	--	
HML		2016	0.0710 (0.035)	720	0.0710 (0.035)	1296	0.0710 (0.035)	--	--	--	--	
MOM		2016		720		1296						
TB		2016		720		1296						

Table 5.2, continued

Country	Fund Family		IFF		CFF		Equality of variance		Equality of means			
	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>		
Pakistan	No. of funds	87	82.8 (2.420)	33	28.5 (2.958)	54	(3.467)	-0.182	0.429	-0.561	0.293	
	No. of families	11	10.81 (1.143)	3	2.62 (1.187)	8	(1.312)	2.343	0.014	3.745	0.000	
	Raw return	1584	0.1373 (0.425)	432	0.1282 (0.742)	1152	(0.551)	0.734	0.232	0.027	0.042	
	Excess return	1584	0.0283 (0.661)	432	0.0192 (0.743)	1152	(0.550)	0.720	0.236	0.051	0.048	
	FTSE		0.0032		0.0032		0.0032					
	Islamic	1584	0.0075 (0.057)	432	0.0075 (0.057)	1152	(0.057)	--	--	--	--	
	FTSE all world	1584	0.0075 (0.063)	432	0.0075 (0.063)	1152	(0.063)	--	--	--	--	
	SMB	1584	-0.0801 (0.281)	432	-0.0801 (0.281)	1152	(0.281)	--	--	--	--	
	HML	1584	0.0460 (0.267)	432	0.0460 (0.267)	1152	(0.267)	--	--	--	--	
	MOM	1584	-0.0190 (0.519)	432	-0.0190 (0.519)	1152	(0.519)	--	--	--	--	
	TB	1584	0.1090 (0.032)	432	0.1090 (0.032)	1152	(0.032)	--	--	--	--	
	Saudi Arabia	No. of funds	162	156.7 (3.590)	162	156.7 (3.590)	--	(--)	--	--	--	--
		No. of families	25	24.8 (1.785)	25	24.8 (1.785)	--	(--)	--	--	--	--
		Raw return	3600	0.5373 (0.342)	3600	0.5373 (0.342)	--	(--)	--	--	--	--
Excess return		3600	0.4683 (0.490)	3600	0.4683 (0.490)	--	(--)	--	--	--	--	
FTSE			0.0032		0.0032		--					
Islamic		3600	0.0075 (0.057)	3600	0.0075 (0.057)	--	(--)	--	--	--	--	
FTSE all world		3600	0.0075 (0.063)	3600	0.0075 (0.063)	--	(--)	--	--	--	--	
SMB		3600	-0.0801 (0.281)	3600	-0.0801 (0.281)	--	(--)	--	--	--	--	
HML		3600	0.0460 (0.267)	3600	0.0460 (0.267)	--	(--)	--	--	--	--	
MOM		3600	-0.0190 (0.519)	3600	-0.0190 (0.519)	--	(--)	--	--	--	--	
TB		3600	0.0690 (0.020)	3600	0.0690 (0.020)	--	(--)	--	--	--	--	

Table 5.2, continued

Country	Fund Family		IFF		CFF		Equality of variance		Equality of means		
	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	
All	No. of funds	494.3 502 (7.819)	301.4 304 (9.168)		191.2 198 (8.147)			7.868	0.000	9.970	0.000
	No. of families	65.8 70 (5.742)	40.6 41 (4.481)		28.2 29 (3.955)			5.215	0.000	8.577	0.000
	Raw return	0.2742 10080 (0.297)	0.2402 5904 (0.445)		0.1343 4176 (0.374)			1.037	0.000	0.558	0.000
	Excess return	0.2062 10080 (0.317)	0.1722 5904 (0.544)		0.0663 4176 (0.471)			1.760	0.000	0.616	0.000
	FTSE	0.0032	0.0032		0.0032						
	Islamic	10080 (0.057)	5904 (0.057)		4176 (0.057)			--	--	--	--
	FTSE all world	0.0075 10080 (0.063)	0.0075 5904 (0.063)		0.0075 4176 (0.063)			--	--	--	--
	SMB	-0.080 10080 (0.281)	-0.0801 5904 (0.281)		-0.0801 4176 (0.281)			--	--	--	--
	HML	0.046 10080 (0.267)	0.0460 5904 (0.267)		0.0460 4176 (0.267)			--	--	--	--
	MOM	-0.019 10080 (0.519)	-0.0190 5904 (0.519)		-0.0190 4176 (0.519)			--	--	--	--
	TB	0.0680 10080 (0.030)	0.0680 5904 (0.030)		0.0680 4176 (0.030)			--	--	--	--

Note: Standard deviation in brackets. SMB is the small-minus-low; HML is high-minus-low; MOM is momentum factor, and TB is the three-month Treasury bill rate. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Observation by countries reveals that consistent with the overall countries description on the fund family raw returns and excess returns, the IFF reports higher raw returns and excess returns compared to CFF for the raw returns for all individual countries led by Malaysia (raw IFF, 0.1533; raw CFF, 1.355; excess IFF, 1.243; excess CFF, 1.065), Indonesia (raw IFF, 0.1432; raw CFF, 0.1422; excess IFF, 0.0722; excess CFF, 0.0712), and Pakistan (raw IFF, 0.1282; raw CFF, 0.1244; excess IFF, 0.0192; excess CFF, 0.0154).

Table 5.3 displays the Spearman rank and Pearson product-moment correlations of fund family, market benchmarks, and the risk factors. Also, below the correlation coefficients are the p-values for the tests of significance of the coefficients, to check if the problem of multicollinearity exists. Fund family returns indicate a low correlation

with returns of both market benchmarks FTSE Global Islamic and FTSE All-World. Similarly, the market indices have low correlation with each other, with significantly positive correlation coefficients. None of the variables or independent variables are highly correlated. The highest reported figure is 0.3050 percent, the correlation between the FTSE Islamic returns and Treasury bill rate. Hence, the estimation is less likely to suffer from the multicollinearity problem.

Table 5.3: Correlation Matrix

	Fund Family	FTSE Islamic	FTSE All World	SMB	HML	MOM	TB
Fund Family	1.000	-0.002* (0.045)	-0.054* (0.001)	0.011 (0.051)	0.006* (0.042)	-0.025* (0.017)	0.029* (0.030)
FTSE Islamic	-0.030* (0.000)	1.000	0.066* (0.001)	0.044* (0.042)	0.044* (0.001)	-0.044* (0.001)	-0.115* (0.002)
FTSE All World	-0.084* (0.000)	0.086* (0.000)	1.000	0.029* (0.001)	0.068* (0.001)	-0.071* (0.001)	-0.229* (0.004)
SMB	0.002** (0.052)	0.006* (0.055)	0.149* (0.000)	1.000	0.041* (0.010)	-0.043* (0.010)	-0.048 (0.239)
HML	0.007* (0.047)	0.058* (0.000)	0.128* (0.000)	0.064* (0.000)	1.000	-0.329* (0.040)	-0.185 (0.121)
MOM	-0.011 (0.229)	-0.068 (0.510)	-0.161 (0.610)	-0.056* (0.000)	-0.419* (0.000)	1.000	0.145 (0.138)
TB	0.045* (0.000)	-0.305* (0.000)	-0.109* (0.000)	-0.008 (0.439)	-0.025* (0.011)	0.015 (0.138)	1.000

Note: *p*-value in brackets. Spearman rank above the diagonal; Pearson product-moment below diagonal. Asterisks denote significance at the * – .10, ** – .05 and *** – .01 level. T.B is the 3-month treasury bills.

5.2.2 Selectivity Skills Models Analysis

This section reports the results of the selectivity for the whole sample including all families of the four countries and for each individual country under study. The total number of families is 70 families, 25 families for Saudi Arabia, 20 for Malaysia, 14 families for Indonesia, and 11 families for Pakistan. This section also compares between the results of the IFF and the CFF. This section reports the results of the empirical analysis of five performance measures used to gauge the performance of the fund family relative to the benchmarks. The performance measures used are raw returns, excess

returns, the Sharpe ratio, the Treynor ratio, the one factor model (Jensen's alpha), and the Carhart four-factor model.

Raw Return, Excess Return, the Sharpe Ratio, and Treynor Ratio

Overall Fund Family and by Country

This sub-section presents the monthly means for raw returns and excess returns, the Sharpe ratio and the Treynor ratio for the fund family of the whole sample. The fund families' performance is compared using two market indices. Table 5.4 show that the mean raw returns for fund families are 0.2742 percent per month, and for the Islamic and conventional benchmarks they are 0.0032 and 0.0075 percent per month, respectively. However, after taking into account the risk-free rate, the mean excess returns of fund families remain positive at 0.2062 percent per month, however, the mean excess returns for both market benchmarks "Islamic and conventional" are negative at -0.0648 and -0.0605. Both the mean returns and mean excess returns for fund families are higher than both the market benchmarks. Although the fund families' returns exceed the returns of the market benchmarks, the returns are less volatile. In addition, the beta for the fund families is lower than that of the market beta 1.000. This gives an initial indicator of the attractiveness of fund families that have higher returns but lower risk, both total and systematic. This could be due to the advantages of fund family such as a more investment opportunities provided by the families.

The results of the Sharpe ratio indicate that investment in fund families earns a Sharpe ratio of 0.6940 percent per month, but the Sharpe ratio for both market benchmarks is negative, -1.1388 and -0.9680, respectively. This means that the investment in the fund families is better than the investment in both market benchmarks – Islamic and conventional. The Treynor ratio shows positive using both market

benchmarks 0.6229 for the Islamic benchmark and 0.5775 for the conventional benchmark. This means that the fund families show better performance than both benchmarks.

Table 5.4 also presents the monthly means for the raw returns and excess returns, the Sharpe ratio and the Treynor ratio for the fund families of each individual country. The fund families' performance is compared using two market indices. The results show that all countries have better performance than the two market benchmarks (Islamic and conventional benchmarks), while the beta for the fund families for all the countries is lower than that of the market beta 1.000. This gives an initial indicator of the attractiveness of those fund families that have higher returns but lower risk, both total and systematic. This could be due to the advantages provided by fund family such as provides a large and different types of funds. Using the raw returns and excess returns measures, Table 5.4 shows that Saudi Arabia has a better performance with 0.5373 and 0.4683 respectively, compared to the other countries. This is followed by Malaysia, Indonesia, and, lastly, Pakistan. All the families in Saudi Arabia are Islamic families because the Saudi market only includes Islamic funds. This gives Saudi Arabia an additional advantage over other countries, especially in that it is a country with a 100% Muslim population.

The Sharpe ratio shows the measures of the mean excess returns compared to the total risk represented by the standard deviation. This measure gives the unit of reward received when taking an extra unit of total risk. The results indicate that investment in fund families earns a positive Sharpe ratio for all countries, but the Sharpe ratios for both market benchmarks are negative for all countries. This means that the investment in fund families is better than investment in both market benchmarks – Islamic and conventional – in these four countries. The results show similar results for the raw

returns and excess returns, with Saudi Arabia being the best country, followed by Malaysia, Indonesia, and, lastly, Pakistan; as follows: Saudi is 1.3692, Malaysia 0.9118, Indonesia 0.3803, and Pakistan 0.0665. The Treynor ratio indicates the measures for the mean excess returns compared to the systematic risk represented by beta. Using the Treynor ratio the results were positive for all countries, whether using the Islamic benchmark (Saudi Arabia 1.6204; Malaysia 0.8283; Indonesia 0.7033; Pakistan 0.1328) or the conventional benchmark (Saudi Arabia 1.7029; Malaysia 0.8220; Indonesia 0.4447; Pakistan 0.0729), with better results when using the Islamic benchmark.

Table 5.4: Mean Raw Returns, Mean Excess Returns, Sharpe, and Treynor Ratios

	Measurement	Fund Family	IFF	CFF	FTSE Islamic	FTSE All World	
Malaysia	<i>Panel A: Mean raw, mean excess return, and Sharpe ratio</i>						
	Mean raw returns	0.2452	0.1533	0.1355	0.0032	0.0075	
	Mean excess returns	0.2162	0.1243	0.1065	-0.0258	-0.0215	
	Std. Dev	0.2371	0.3330	0.4073	0.0569	0.0625	
	Sharpe ratio	0.9118	0.3732	0.2614	-0.4534	-0.3440	
	<i>Panel B: Beta and Treynor ratio using FTSE Islamic as benchmark</i>						
	Beta	0.2610	0.2310	0.2330	1.0000	---	
	Treynor	0.8283	0.5380	0.4570	---	---	
	<i>Panel C: Beta and Treynor ratio using FTSE All world as benchmark</i>						
	Beta	0.2630	0.2280	0.4010	---	1.0000	
	Treynor	0.8220	0.5451	0.2655	---	---	
	Indonesia	<i>Panel A: Mean raw, mean excess return, and Sharpe ratio</i>					
		Mean raw returns	0.2391	0.1422	0.1432	0.0032	0.0075
Mean excess returns		0.1681	0.0712	0.0722	-0.0678	-0.0635	
Std. Dev		0.4420	0.5040	0.4370	0.0569	0.0625	
Sharpe ratio		0.3803	0.1412	0.1652	-1.1915	-1.0160	
<i>Panel B: Beta and Treynor ratio using FTSE Islamic as benchmark</i>							
Beta		0.2390	0.3350	0.5090	1.0000	---	
Treynor		0.7033	0.2125	0.1418	---	---	
<i>Panel C: Beta and Treynor ratio using FTSE All world as benchmark</i>							
Beta		0.3780	0.6139	0.4669	---	1.0000	
Treynor		0.4447	0.1159	0.1546	---	---	
Pakistan		<i>Panel A: Mean raw, mean excess return, and Sharpe ratio</i>					
		Mean raw returns	0.1373	0.1282	0.1244	0.0032	0.0075
	Mean excess returns	0.0283	0.0192	0.0154	-0.1058	-0.1015	
	Std. Dev	0.4250	0.7420	0.5510	0.0569	0.0625	
	Sharpe ratio	0.0665	0.0258	0.0279	-1.8594	-1.6240	
	<i>Panel B: Beta and Treynor ratio using FTSE Islamic as benchmark</i>						
	Beta	0.2130	0.0537	0.1460	1.0000	---	
	Treynor	0.1328	0.3577	0.1054	---	---	
	<i>Panel C: Beta and Treynor ratio using FTSE All world as benchmark</i>						
	Beta	0.3880	0.5130	0.9100	---	1.0000	
	Treynor	0.0729	0.0374	0.0169	---	---	

Table 5.4, continued

	Measurement	Fund Family	IFF	CFF	FTSE Islamic	FTSE All World
Saudi Arabia	<i>Panel A: Mean raw, mean excess return, and Sharpe ratio</i>					
	Mean raw returns	0.5373	0.5373	---	0.0032	0.0075
	Mean excess returns	0.4683	0.4683	---	-0.0658	-0.0615
	Std. Dev	0.3420	0.3420	---	0.0569	0.0625
	Sharpe ratio	1.3692	1.3692	---	-1.1561	-0.9840
	<i>Panel B: Beta and Treynor ratio using FTSE Islamic as benchmark</i>					
	Beta	0.2890	0.2890	---	1.0000	---
	Treynor	1.6204	1.6204	---	---	---
	<i>Panel C: Beta and Treynor ratio using FTSE All world as benchmark</i>					
	Beta	0.2750	0.2750	---	---	1.0000
	Treynor	1.7029	1.7029	---	---	---
All	<i>Panel A: Mean raw, mean excess return, and Sharpe ratio</i>					
	Mean raw returns	0.2742	0.2402	0.1343	0.0032	0.0075
	Mean excess returns	0.2062	0.1722	0.0663	-0.0648	-0.0605
	Std. Dev	0.2971	0.4450	0.3740	0.0569	0.0625
	Sharpe ratio	0.6940	0.3869	0.1772	-1.1388	-0.9680
	<i>Panel B: Beta and Treynor ratio using FTSE Islamic as benchmark</i>					
	Beta	0.3310	0.5580	0.2210	1.0000	---
	Treynor	0.6229	0.3086	0.3000	---	---
	<i>Panel C: Beta and Treynor ratio using FTSE All world as benchmark</i>					
	Beta	0.3570	0.7560	0.2660	---	1.0000
	Treynor	0.5775	0.2277	0.2492	---	---

Note: ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

This sub-section discusses whether there is a difference between the performance of fund families with a high weight average percentage of Islamic mutual funds in the fund family (IFF) and fund families with a majority of conventional mutual funds in the fund family (CFF). Table 5.4 also presents the results of this sub-section. The analysis of the performance of IFF for Saudi Arabia is similar to the analysis in the previous sub-section as the sample of all fund families in Saudi Arabia are Islamic-focused families. Thus, this section focuses on the rest of the sample countries in the study, in addition to the whole sample of IFF and CFF.

The mean raw returns for both the IFF and CFF are 0.2402 and 0.1343 percent per month, respectively. However, after taking into account the risk-free rate, the mean

excess returns of IFF and CFF remain positive at 0.1722 and 0.0663 percent per month. Both IFF and CFF performed better than both market benchmarks. Moreover, both the mean returns and mean excess returns for the IFF are higher than those for the CFF. This gives an initial indicator of the attractiveness of IFF compared to CFF. For the Sharpe ratio, the results suggest that investment in IFF earns a Sharpe ratio of 0.3869 percent per month, which is higher than a comparable investment in CFF 0.1772 or investment in the market a whole. For the Treynor ratio, the results show that IFF outperform conventional families when using the Islamic benchmark (IFF, 0.3086; CFF, 0.3000), but, when using the conventional benchmark, CFF outperforms IFF (IFF, 0.2277; CFF, 0.2492).

For the individual countries, the IFF outperformed the CFF for all the countries under study. The results were as follows: Malaysia (IFF raw returns, 0.1533; excess returns, 0.1243; CFF raw returns, 0.1355; excess returns, 0.1065); Indonesia (IFF raw returns, 0.1422; excess returns, 0.0712; CFF raw returns, 0.1432; excess returns, 0.0722); and Pakistan (IFF raw returns, 0.1282; excess returns, 0.0192; CFF raw returns, 0.1244; excess returns, 0.0154). For IFF the best performing country is Malaysia, followed by Indonesia, and then Pakistan, while for CFF the best performing country is Indonesia, followed by Malaysia, and then Pakistan.

For the Sharpe ratio, only Malaysia IFF performed better than CFF, while for Indonesia and Pakistan CFF perform better than IFF. The results were, Malaysia (IFF, 0.3732; CFF, 0.2614), Indonesia (IFF, 0.1412; CFF, 0.1652), and Pakistan (IFF, 0.0258; CFF, 0.0279). Moreover, for both IFF and CFF, Malaysia performed better than Indonesia and Pakistan, which was last. For the Treynor ratio, in Malaysia and Pakistan, whether using the Islamic or conventional benchmark, IFF performed better than CFF, while for Indonesia when using the Islamic benchmark, IFF performed better than CFF.

However, when using the conventional benchmark CFF performed better than IFF. Moreover, whether using the Islamic or conventional benchmark, Malaysia performed better, and then Indonesia, and last Pakistan for both types of fund family.

In summary, the findings of these basic performance models lead us to conclude that the fund family outperforms both the market benchmarks when relative performance measures are used. This is justified by the greater diversification provided by fund families, which offers the advantages of improving the overall performance of families. The modern portfolio theory (MPT) indicates the risk-reduction advantages associated with maintaining a diversified portfolio of assets in addition to the risk-and-return relationship that maximises the anticipated return based on a given market risk level. In addition, Islamic focused families (IFF) outperform both the market benchmarks and conventional focused families (CFF) when relative performance measures are used in Malaysia and on the all countries' sample analysis. This is because Malaysia and Saudi Arabia lead the IFF. In addition, for raw returns and excess returns in Indonesia and Pakistan, IFF outperforms CCF. These results were similar to the results of Abdullah et al. (2007), and Merdad et al. (2010) at the fund level, who indicated that the IMFs outperform the CMFs. While for the Sharpe and Treynor ratio in Indonesia and Pakistan, CFF outperforms IFF. Although the relative performance measures are commonly used in practice, these measures can only be used in ranking fund families in relation to their peers in that they provide no fundamental statistical or economic meaning. Therefore, the next sections provide the results of the single-and multi-factor models. These performance models, based on the CAPM and Carhart four-factor model, give an estimate of the intercept (alpha), which refers to performance in relation to the benchmark return and market risk factor.

One Factor Model (Jensen, 1968)

Overall Fund Family and by Country

This sub-section provides the results for the analysis of performance employing the one-factor model (Jensen, 1968) and both market benchmarks “FTSE Global Islamic and FTSE All-World”. Alpha indicates the monthly abnormal returns of the fund families. As shown in Table 5.5, the alpha estimate for fund families is positive significant for the all countries’ sample whether using the Islamic or conventional benchmarks. This indicates that the fund families outperform both market benchmarks. The alpha estimate for the fund families for the all countries’ sample equals 0.1942 percent per month for the FTSE Global Islamic and 0.2025 percent per month for the FTSE All-World. This indicates that the fund families outperform both market benchmarks. This result is also in line with the results of the traditional measures in the previous section.

The adjusted R^2 for the fund families is 81 percent for the FTSE Global Islamic and 85 percent for the FTSE All-World. The high adjusted R^2 also indicates that the fund family managers employ a passive strategy by following the market closely, but are unable to perform well. The results also show that the alpha using a conventional benchmark is better than the alpha using the Islamic benchmark. This is due to the restrictions placed on Islamic investments that may limit performance; R^2 for individual countries also has the same results.

For the individual countries’ analysis, Saudi Arabia, Malaysia, and Indonesia have a positive significant estimate alpha for both market benchmarks. This means that the fund family in these countries outperforms both market benchmarks. Saudi Arabia has a better performance compared to the other countries whether using the Islamic or conventional market benchmarks. This is followed by Malaysia, then Indonesia, and,

lastly, Pakistan. Pakistan has an insignificant estimate alpha for both market benchmarks. The justification for this result is due to a lack of understanding of the complexities and significance of the economy's mutual fund industry, which has resulted in the government's tax policies that have seriously affected the industry's growth. In addition, the steps taken by the government over the past few years have been harmful to the sector of mutual funds as they contribute to the administration costs, which affect the return.

Table 5.5: One-Factor Model (Jensen, 1968)

	Fund Family		IFF		CFF		Difference		
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	
Malaysia	<i>Panel A: FTSE Global Islamic</i>								
	Coeff	0.0177	0.0319	0.0302	0.2381	0.0081	-0.2371	0.0253	0.1801
	Std.err	0.0075	0.1188	0.0091	0.1471	0.0123	0.1962	0.0144	0.2216
	P-value	0.0362	0.7878	0.0010	0.1051	0.0490	0.2267	0.0490	0.4100
	R ²	---	0.53	---	0.55	---	0.59	---	0.61
	<i>Panel B: FTSE All World</i>								
	Coeff	0.0271	0.2666	0.0282	0.1416	0.0162	0.3751	0.0255	0.1961
	Std.err	0.0078	0.1433	0.0091	0.1781	0.0133	0.2371	0.0157	0.2672
P-value	0.0048	0.0630	0.0045	0.4270	0.0282	0.1140	0.0504	0.4621	
R ²	---	0.57	---	0.53	---	0.61	---	0.52	
Indonesia	<i>Panel A: FTSE Global Islamic</i>								
	Coeff	0.0163	-0.075	0.0961	0.0787	0.2534	-0.2780	-0.121	-0.117
	Std.err	0.0162	0.1785	0.0224	0.2451	0.0232	0.2461	0.030	0.329
	P-value	0.0005	0.6740	0.0000	0.7480	0.0000	0.2591	0.000	0.723
	R ²	---	0.66	---	0.61	---	0.63	---	0.69
	<i>Panel B: FTSE All World</i>								
	Coeff	0.0232	0.2030	0.1373	0.6651	0.2921	0.2981	-0.115	0.767
	Std.err	0.0921	0.1675	0.0252	0.2902	0.0252	0.2922	0.020	0.429
P-value	0.0115	0.2255	0.0000	0.0221	0.0000	0.3064	0.000	0.074	
R ²	---	0.67	---	0.64	---	0.62	---	0.59	
Pakistan	<i>Panel A: FTSE Global Islamic</i>								
	Coeff	0.015	-0.031	0.019	-0.192	0.032	0.166	0.006	-0.245
	Std.err	0.035	0.2650	0.049	0.403	0.040	0.327	0.059	0.483
	P-value	0.447	0.9057	0.699	0.634	0.421	0.613	0.899	0.611
	<i>Panel B: FTSE All World</i>								
	Coeff	0.016	-0.106	0.075	0.337	-0.053	-0.641	0.039	0.055
	Std.err	0.037	0.314	0.056	0.477	0.046	0.387	0.025	0.544
	P-value	0.654	0.735	0.185	0.480	0.245	0.097	0.121	0.919
R ²	---	0.63	---	0.60	---	0.59	---	0.61	

Table 5.5, continued

	Fund Family		IFF		CFF		Difference		
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	
Saudi Arabia	<i>Panel A: FTSE Global Islamic</i>								
	Coeff	0.4714	0.0594	0.4714	0.0594	---	---	---	---
	Std.err	0.0120	0.1327	0.0120	0.1327	---	---	---	---
	P-value	0.0018	0.6540	0.0018	0.6540	---	---	---	---
	R²	---	0.55	---	0.55	---	---	---	---
	<i>Panel B: FTSE All World</i>								
	Coeff	0.4904	0.3397	0.4904	0.3397	---	---	---	---
	Std.err	0.0131	0.1530	0.0131	0.1530	---	---	---	---
P-value	0.0028	0.0264	0.0028	0.0264	---	---	---	---	
R²	---	0.61	---	0.61	---	---	---	---	
All	<i>Panel A: FTSE Global Islamic</i>								
	Coeff	0.1942	-0.243	0.2474	-0.176	0.0704	-0.2951	0.2116	-0.192
	Std.err	0.0072	0.0801	0.0091	0.0990	0.0122	0.0000	0.0102	0.1152
	P-value	0.0002	0.0023	0.0000	0.0762	0.0292	0.0221	0.0000	0.0962
	R²	---	0.81	---	0.72	---	0.69	---	0.72
	<i>Panel B: FTSE All World</i>								
	Coeff	0.2025	-0.107	0.2584	-0.018	0.0762	-0.1972	0.2292	0.0830
	Std.err	0.0077	0.0916	0.0094	0.1133	0.0125	0.147	0.0113	0.1322
P-value	0.0001	0.2441	0.0000	0.9171	0.0000	0.180	0.0000	0.5302	
R²	---	0.85	---	0.70	---	0.73	---	0.70	

Note: Coeff is the coefficient. Std.err is the standard error. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

This sub-section provides the results for the analysis of the Islamic focused family (IFF) and conventional focused family (CFF) performance, and the difference portfolio (IFF-CFF) employing the one-factor model (Jensen, 1968) using the same two market benchmarks. Alpha indicates the monthly abnormal returns of the fund families. Similar to the previous performance measurements, this section focuses on three countries (Malaysia, Indonesia, and Pakistan) in addition to the overall fund family sample. Table 5.5 show that for the all counties sample, the alpha estimate for the IFF is (0.2474 and 0.2584 percent) per month for Islamic and conventional market benchmarks respectively, which is higher than that of the CFF (0.0704 and 0.0762 percent). In addition, the alphas of both are positively significantly different from zero. This signifies that the IFF significantly outperform the CFF. The results also show that the

alpha of the difference portfolio (IFF-CFF) is significant for both market benchmarks at the 5 percent level. This means the IFF significantly outperforms CFF.

For the individual country analysis, Malaysia and Indonesia are positively significant for both types of fund family, which means that the managers of the IFF and CFF have good selectivity skills. The results indicate that, for Malaysia, the IFF outperforms CFF for both market benchmarks (Islamic benchmark: IFF, 0.0302; CFF, 0.0081 and conventional benchmark: IFF, 0.0282; CFF, 0.0162). This means that the IFF managers have better selectivity skills than the CFF managers, which could be because the IFF have more diversification and less risk than the CFF. However, for Indonesia, the CFF outperforms IFF using both market benchmarks (Islamic benchmark: IFF, 0.0961; CFF, 0.2534 and conventional benchmark: IFF, 0.1373; CFF, 0.2921). The different results between Malaysia and Indonesia can be justified by in Malaysia the screening process does not add more fees to the Islamic investments and the conventional managers in Indonesia have more experience to manages large numbers of funds. For Pakistan, the results are insignificant for both types of fund family, which means that the managers of IFF and CFF in Pakistan have poor selectivity skills. According to previous studies (Hayat & Kraeussl 2011), the poor performance may result from expenses and fees. This is in line with the Pakistani government's measures to impose more taxes on the mutual funds industry. For the results of the difference portfolio (IFF-CFF), for Malaysia and Pakistan the results indicate that the IFF outperforms CFF, while for Indonesia the IFF underperforms CFF.

Four-factor Model (Carhart, 1997)

Overall Fund Family and by Country

The factors for the four-factor models are not easily available, so this thesis used the data available on the Fama and French website, which, in turn, employs the FSTE All-World database to construct monthly for the four-factor model (Hammami & Oueslati, 2017). Table 5.6 provides the results of the four-factor model for the fund families of the four countries using the FSTE All-World as a market benchmark.

As shown in Table 5.6, the four-factor alpha for the fund families of the all fund family sample is 0.201 percent and significant, this indicates that, on average, the fund families are able to outperform the four-factor benchmarks. In addition, the results indicate that the fund families' exhibit lower risk with a beta of -0.140. This result is similar to the results using the one-factor model. In terms of size preference, given that the SMB factor loading is -0.034 and statistically significant, fund families prefer small stock to big stock. The HML factor for fund families is -0.054 and statistically significant, suggesting that they display a preference for growth-to-value stock. The MOM factor for fund families is not significant.

For the individual country analysis, Saudi Arabia, Malaysia, and Indonesia appear to have a positively significant alpha (Saudi Arabia, 0.491; Malaysia, 0.289; Indonesia, 0.201 percent), which indicates that, on average, the fund families in these counties are able to outperform the four-factor benchmarks. In addition, the results indicate that the fund families in Saudi Arabia exhibit lower risk with a beta of 0.022. Although Pakistan shows insignificant four factors alpha, this indicates that, on average, the fund families in Pakistan are not able to outperform the four-factor benchmarks. In terms of size preference, given that the SMB factor is statistically significant for all countries except

Pakistan, fund families prefer small stock to big stock. The HML and MOM factors are insignificant for all the countries in the sample.

Fund families' superior performance can be attributed to the fund families removing unsystematic risk by the advantages provided, which means that the families make funds work within these families comprising only market risk (systematic risk). The constant or error term in the subsequent regression helps to remove any remaining unsystematic risk. The results accept hypothesis one (selectivity part), fund family managers exhibit good selectivity skills except for Pakistan.

Table 5.6: Carhart's Four Factor Model (Carhart, 1997)

		Fund Family			IFF			CFF			Difference		
		Coeff	S.E	P.V	Coeff	S.E	P.V	Coeff	S.E	P.V	Coeff	S.E	P.V
Malaysia	Alpha	0.289	0.008	0.006	0.034	0.010	0.001	0.023	0.014	0.004	0.040	0.016	0.011
	Beta	0.258	0.144	0.024	0.125	0.178	0.003	0.371	0.238	0.119	0.173	0.267	0.017
	SMB	0.013	0.025	0.011	0.009	0.031	0.776	0.007	0.041	0.868	0.030	0.046	0.710
	HML	0.034	0.029	0.235	0.032	0.036	0.376	0.055	0.047	0.543	0.026	0.054	0.432
	MO	0.042	0.015	0.440	0.041	0.018	0.025	0.050	0.024	0.390	0.083	0.057	0.063
	R ²	---	0.72	---	---	0.69	---	---	0.53	---	---	0.67	---
Indonesia	Alpha	0.201	0.019	0.000	0.141	0.026	0.000	0.283	0.026	0.000	-0.070	0.035	0.040
	Beta	0.031	0.211	0.017	0.676	0.291	0.020	0.294	0.292	0.315	0.600	0.391	0.125
	SMB	0.025	0.039	0.013	0.090	0.053	0.291	-0.063	0.054	0.245	0.021	0.072	0.272
	HML	-0.004	0.047	0.924	-0.033	0.063	0.302	0.024	0.063	0.451	-0.051	0.085	0.046
	MO	-0.024	0.023	0.294	-0.028	0.032	0.383	-0.019	0.032	0.561	-0.010	0.043	0.617
	R ²	---	0.78	---	---	0.77	---	---	0.72	---	---	0.75	---
Pakistan	Alpha	0.013	0.038	0.744	0.070	0.058	0.230	-0.054	0.047	0.245	0.070	0.058	0.230
	Beta	-0.131	0.314	0.677	0.303	0.478	0.526	-0.638	0.387	0.100	-0.303	0.478	0.526
	SMB	0.022	0.059	0.708	-0.024	0.091	0.792	0.081	0.074	0.275	-0.024	0.091	0.592
	HML	0.092	0.071	0.191	0.124	0.107	0.244	0.048	0.088	0.586	0.124	0.107	0.244
	MO	-0.004	0.036	0.917	0.025	0.055	0.647	-0.038	0.045	0.395	0.025	0.055	0.547
	R ²	---	0.59	---	---	0.51	---	---	0.57	---	---	0.50	---
Saudi Arabia	Alpha	0.491	0.013	0.000	0.491	0.013	0.000	---	---	---	---	---	---
	Beta	0.022	0.153	0.035	0.022	0.153	0.035	---	---	---	---	---	---
	SMB	0.027	0.029	0.035	0.027	0.029	0.035	---	---	---	---	---	---
	HML	0.042	0.034	0.216	0.042	0.034	0.216	---	---	---	---	---	---
	MO	0.007	0.017	0.690	0.007	0.017	0.690	---	---	---	---	---	---
	R ²	---	0.85	---	---	0.85	---	---	---	---	---	---	---
All	Alpha	0.201	-0.08	0.001	0.259	0.010	0.000	0.075	0.013	0.000	0.231	0.012	0.000
	Beta	-0.140	0.097	0.051	-0.024	0.114	0.833	-0.010	0.148	0.155	-0.07	0.132	0.601
	SMB	-0.034	0.002	0.049	0.027	0.023	0.236	-0.007	0.032	0.325	0.042	0.027	0.118
	HML	-0.054	0.002	0.002	0.047	0.027	0.083	-0.049	0.037	0.182	0.052	0.032	0.097
	MO	-0.002	0.002	0.204	0.011	0.014	0.421	-0.007	0.019	0.719	0.011	0.016	0.510
	R ²	---	0.71	---	---	0.64	---	---	0.59	---	---	0.63	---

Note: Coeff is the coefficient. Std.err is the standard error. P.V is the P-Value. 'All' includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia. P.V is the p.value.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

This sub-section shows the results of IFF and CFF, and the difference portfolio (IFF-CFF), for the all countries analysis, and for Malaysia, Indonesia, and Pakistan. In Table 5.6, similar to the results of the one factor model, the IFF and CFF for the all countries analysis appear positively significant alpha, this means that, on average, both types of fund family are able to outperform the four factor benchmarks. The results also show that the IFF of the all fund family sample 0.259 outperforms CFF 0.075. In addition, the IFF market beta is -0.024 and the CFF market beta is -0.010, which indicates that the IFF exhibits lower risk than the CFF. At the same time, the results of the difference portfolio are significant at the 5 percent level, which supports the results of the IFF outperforms the CFF.

For the individual countries analysis, similar to the results of the one factor model, Malaysia and Indonesia appear positively significant alpha. In Malaysia the IFF 0.034 outperforms CFF 0.023, and the IFF has lower risk than the CFF according to the market beta, this is due to the IFF included the CMFs in addition to IMFs, IFF is the fund family includes 33% or less as a conventional mutual funds. In Indonesia, the CFF 0.283 outperforms the IFF 0.141, and the CFF has lower risk than the IFF. The results note that Indonesia outperforms Malaysia according to the Carhart four factor model. Moreover, the difference portfolio for Indonesia is negatively significant, which indicates that the IFF is not able to outperform the CFF in Indonesia. However, it is positively significant for Malaysia, which means that the IFF in Malaysia is able to outperform the CFF. For Pakistan the results are similar to the results of the one factor model, in that they are insignificant.

5.2.3 Market Timing Ability Models Analysis

This section reports the results of the empirical analysis of the two performance measures used to gauge the performance of the fund family of overall fund family sample analysis, and for the Islamic focused family (IFF), conventional focused family (CFF), and difference portfolio (IFF-CFF) relative to the benchmarks. These measures are used to evaluate the timing ability of managers. The performance measures used are the Treynor-Mazuy model (TM) and the Hendrickson-Merton model (HM).

Overall Fund Family and by Country

This sub-section presents the results for the analysis of the security selection and market timing ability using the Treynor-Mazuy model (TM) and Hendrickson-Merton model (HM) for the fund family of the overall fund family sample. The results show that fund families have good selectivity skills but appear to have poor market timing ability irrespective of the benchmarks using both market benchmarks "FTSE Global Islamic and FTSE All-World". Table 5.7 shows that the alpha of all countries sample is positively significant and equal to 0.195 and 0.193, respectively, and Gamma is negative but insignificant and equal to -0.129 and -0.347, respectively. For the results of the Hendrickson-Merton model (HM), the same Table shows similar results. Alpha is positively significant for both market benchmarks, while the Delta is positive but insignificant using the Islamic benchmark, and negative but also insignificant using the conventional benchmark. The results conclude that the fund family of overall fund family sample shows good selectivity skills, but poor timing ability.

Table 5.7 also presents the results for the analysis of the security selection and market timing ability for fund families for each individual country. In the case of Malaysia and Indonesia, the results of the selectivity skills are similar to the results of

the overall fund family sample analysis. Alpha is positively significant for both the (TM) and (HM), whether using Islamic or conventional benchmarks. In the case of Pakistan, the alpha is insignificant for both the (TM) and (HM), whether using Islamic or conventional benchmarks.

Overall, both market timing ability measures (Treyner-Mazuy model (TM) and Hendrickson-Merton model (HM)) provide similar results, and there is strong evidence that fund families' managers have a good selectivity skills, which supports the results of the one-factor and four-factor models. This is due to the benefits provided by the advantages of fund families like diversification and more investment opportunities. However, fund families have weak market timing ability. The reason for this is that the fund families contain large and different types of funds, and, thus, the management process becomes more difficult, which may reduce the ability and efficiency of the managers. In other words, the managers are not able to beat the market benchmarks by predicting its movements and buying and selling accordingly.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

Table 5.7 also presents the results for the analysis of the security selection and market timing ability for the Treynor-Mazuy model (TM) and Hendrickson-Merton model (HM) for the Islamic focused family (IFF) and conventional focused family (CFF). The results show that both the IFF and CFF exhibit security selection coefficients significantly different from zero irrespective of the benchmarks used, while both the IFF and CFF exhibit coefficients insignificantly different from zero irrespective of the benchmarks used. Alpha is positive for both the IFF and CFF whether using Islamic or conventional market benchmarks. Nevertheless, there is evidence that the IFF have better security selection and market timing ability than the CFF (except for

TM by using the FTSE All World). In conclusion, both IFF and CFF have good selectivity skills, while both have poor market timing ability, with a relative advantage for IFF. For the difference portfolio (IFF-CFF) analysis, for both measures (TM and HM) whether using Islamic or conventional market benchmarks, the results are positively significant, which suggests that the IFF outperforms the CFF.

For the individual countries' analysis, in Malaysia, the IFF and CFF have a positively significant alpha, which means that both types of fund family have good selectivity skills. However, both types of fund family appear to have insignificant Gamma and Delta. The different portfolio analysis shows that the IFF outperforms the CFF in Malaysia, while, in Indonesia, the results show that the CFF outperforms the IFF; the difference portfolio (IFF-CFF) analysis supports these results since it is negatively significant, which means that the IFF underperforms CFF. In the case of Pakistan, the results of both measures show insignificant Gamma, and Delta. Nevertheless, the difference portfolio (IFF-CFF) analysis provides evidence that the IFF outperforms the CFF, since the result is positively significant, which means that even though the IFF underperforms the market benchmarks, it outperforms the CFF.

In summary, the results indicated that fund family outperformed market benchmarks and demonstrated good selectivity skills but poor market timing ability. Therefore, hypothesis one (timing part) was rejected. In addition, the results showed that Saudi Arabia performed better than other countries. The subsequent ranks were Malaysia, Indonesia, and Pakistan. Comparing between IFF and CFF, the results showed that their performance differ, which means that hypothesis (one. A) was accepted. Aggregating the sample countries together, IFF outperformed CFF. Individually however, this was not always so. In Malaysia and Pakistan, IFF outperformed CFF, while in Indonesia, CFF outperformed IFF.

Table 5.7: Market Timing Models (TM and HM)

		Fund Family		IFF		CFF		Difference		
		Coef (S.E)	P. Value	Coef (S.E)	P. Value	Coef (S.E)	P. Value	Coef (S.E)	P. Value	
Malaysia	<i>Panel A: FTSE Global Islamic</i>									
	Alpha	0.020 (0.008)	0.011	0.034 (0.010)	0.001	0.006 (0.013)	0.047	0.033 (0.015)	0.027	
	Gama	-0.620 (0.363)	0.087	-0.395 (0.449)	0.379	-0.879 (0.599)	0.143	-0.097 (0.673)	0.043	
	R²	0.77	---	0.71	---	0.54	---	0.70	---	
	Alpha	0.018 (0.008)	0.021	0.031 (0.010)	0.002	0.004 (0.013)	0.022	0.031 (0.015)	0.035	
	Delta	-0.228 (0.231)	0.323	-0.073 (0.286)	0.798	-0.366 (0.382)	0.338	-0.567 (0.429)	0.037	
	R²	(0.74)	---	0.73	---	0.61	---	0.68	---	
	<i>Panel B: FTSE All World</i>									
	Alpha	0.024 (0.008)	0.003	0.029 (0.010)	0.003	0.019 (0.013)	0.018	0.024 (0.015)	0.048	
	Gama	-2.309 (1.535)	0.132	-0.948 (1.903)	0.618	-4.103 (2.535)	0.106	1.044 (2.854)	0.714	
	R²	0.79	---	0.53	---	0.74	---	0.64	---	
	Alpha	0.024 (0.008)	0.009	0.028 (0.010)	0.008	0.019 (0.014)	0.017	0.020 (0.016)	0.009	
Delta	-0.193 (0.369)	0.112	0.046 (0.457)	0.919	-0.428 (0.609)	0.482	0.596 (0.686)	0.038		
R²	0.75	---	0.59	---	0.71	---	0.69	---		
Indonesia	<i>Panel A: FTSE Global Islamic</i>									
	Alpha	0.162 (0.018)	0.002	0.099 (0.025)	0.000	0.248 (0.025)	0.000	-0.107 (0.033)	0.001	
	Gama	0.039 (0.542)	0.942	-0.216 (0.745)	0.772	0.371 (0.748)	0.619	-1.015 (0.999)	0.010	
	R²	0.74	---	0.69	---	0.66	---	0.71	---	
	Alpha	0.161 (0.016)	0.004	0.095 (0.023)	0.000	0.250 (0.023)	0.000	-0.119 (0.030)	0.000	
	Delta	0.189 (0.240)	0.431	0.130 (0.331)	0.695	0.259 (0.332)	0.436	-0.229 (0.443)	0.060	
	R²	0.75	---	0.68	---	0.64	---	0.72	---	
	<i>Panel B: FTSE All World</i>									
	Alpha	0.212 (0.019)	0.004	0.135 (0.027)	0.000	0.315 (0.027)	0.000	-0.086 (0.036)	0.018	
	Gama	0.416 (2.039)	0.236	-0.437 (2.803)	0.876	6.161 (2.812)	0.029	-1.600 (3.762)	0.039	
	R²	0.79	---	0.66	---	0.68	---	0.73	---	
	Alpha	0.205 (0.019)	0.002	0.128 (0.027)	0.000	0.309 (0.027)	0.000	-0.098 (0.036)	0.007	
Delta	0.113 (0.335)	0.736	-0.398 (0.460)	0.387	0.804 (0.461)	0.082	-1.186 (0.616)	0.044		
R²	0.78	---	0.69	---	0.63	---	0.71	---		

Table 5.7, continued

	Fund Family		IFF		CFF		Difference		
	Coef (S.E)	P. Value	Coef (S.E)	P. Value	Coef (S.E)	P. Value	Coef (S.E)	P. Value	
Pakistan	<i>Panel A: FTSE Global Islamic</i>								
	Alpha	0.026 (0.033)	0.429	0.022 (0.050)	0.659	0.012 (0.041)	0.436	0.022 (0.050)	0.049
	Gama	-0.206 (0.871)	0.813	-0.440 (1.323)	0.739	0.066 (1.074)	0.951	-0.440 (1.323)	0.839
	R²	0.60	---	0.56	---	0.50	---	0.59	---
	Alpha	0.025 (0.033)	0.441	0.019 (0.050)	0.703	0.013 (0.040)	0.407	0.019 (0.050)	0.033
	Delta	0.096 (0.275)	0.727	-0.069 (0.417)	0.870	0.290 (0.339)	0.393	-0.069 (0.417)	0.870
	R²	0.61	---	0.58	---	0.51	---	0.53	---
	<i>Panel B: FTSE All World</i>								
	Alpha	0.006 (0.061)	0.919	0.116 (0.093)	0.212	-0.126 (0.075)	0.093	0.116 (0.093)	0.042
	Gama	-0.784 (3.569)	0.826	2.993 (5.422)	0.581	-5.382 (4.395)	0.221	2.993 (5.422)	0.041
	R²	0.66	---	0.55	---	0.66	---	0.63	---
	Alpha	0.009 (0.049)	0.861	0.072 (0.075)	0.336	-0.105 (0.061)	0.064	0.072 (0.075)	0.036
Delta	0.338 (0.427)	0.429	-0.045 (0.649)	0.945	-0.682 (0.526)	0.195	-0.045 (0.649)	0.945	
R²	0.63	---	0.53	---	0.67	---	0.65	---	
Saudi Arabia	<i>Panel A: FTSE Global Islamic</i>								
	Alpha	0.473 (0.012)	0.005	0.473 (0.012)	0.005	---	---	---	---
	Gama	-0.181 (0.396)	0.648	-0.181 (0.396)	0.648	---	---	---	---
	R²	0.82	---	0.82	---	---	---	---	---
	Alpha	0.472 (0.012)	0.001	0.472 (0.012)	0.001	---	---	---	---
	Delta	-0.007 (0.185)	0.968	-0.007 (0.185)	0.968	---	---	---	---
	R²	0.80	---	0.80	---	---	---	---	---
	<i>Panel B: FTSE All World</i>								
	Alpha	0.499 (0.016)	0.001	0.499 (0.016)	0.001	---	---	---	---
	Gama	-1.538 (1.498)	0.304	-1.538 (1.498)	0.304	---	---	---	---
	R²	0.73	---	0.73	---	---	---	---	---
	Alpha	0.508 (0.015)	0.009	0.508 (0.015)	0.009	---	---	---	---
Delta	-0.039 (0.291)	0.011	-0.039 (0.291)	0.011	---	---	---	---	
R²	0.71	---	0.71	---	---	---	---	---	

Table 5.7, continued

	Fund Family		IFF		CFF		Difference		
	Coef (S.E)	P. Value	Coef (S.E)	P. Value	Coef (S.E)	P. Value	Coef (S.E)	P. Value	
All	<i>Panel A: FTSE Global Islamic</i>								
	Alpha	0.195 (0.008)	0.019	0.248 (0.009)	0.000	0.073 (0.012)	0.000	0.215 (0.011)	0.000
	Gama	-0.129 (0.255)	0.612	-0.082 (0.310)	0.791	-0.274 (0.424)	0.517	-0.406 (0.362)	0.026
	R²	0.79	---	0.74	---	0.57	---	0.69	---
	Alpha	0.194 (0.007)	0.002	0.247 (0.009)	0.000	0.069 (0.012)	0.000	0.212 (0.010)	0.000
	Delta	0.087 (0.119)	0.498	0.063 (0.145)	0.663	0.098 (0.199)	0.621	0.153 (0.169)	0.364
	R²	0.75	---	0.76	---	0.60	---	0.67	---
	<i>Panel B: FTSE All World</i>								
	Alpha	0.193 (0.008)	0.046	0.246 (0.010)	0.000	0.074 (0.013)	0.000	0.220 (0.012)	0.000
	Gama	-0.347 (0.087)	0.006	-3.167 (1.091)	0.074	-0.957 (1.460)	0.512	-2.468 (1.272)	0.052
	R²	0.76	---	0.59	---	0.78	---	0.68	---
	Alpha	0.199 (0.008)	0.001	0.253 (0.010)	0.000	0.075 (0.013)	0.000	0.224 (0.012)	0.000
	Delta	-0.307 (0.169)	0.061	-0.317 (0.201)	0.115	-0.202 (0.255)	0.430	-0.309 (0.234)	0.287
	R²	0.75	---	0.69	---	0.84	---	0.70	---

Note: Alpha indicates the monthly abnormal returns of fund families. Gamma and Delta are the coefficient of the quadratic variable representing market timing ability. Gamma represent TM model, and Delta represent HM model. Coeff is the coefficient. Std. err is the standard error. Standard error in brackets. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

5.2.4 Fund Family Performance and Star (Poor) Funds

This empirical section tests how star and poor funds affect fund family performance. In addition to other fund family attributes as control variables (fund family age, fund family size, number of funds within the fund family, total fund family risk). Fund family performance was calculated using the weighted average of Carhart’s four-factor model on all funds in the fund family.

Descriptive Statistics

This sub-section shows the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. The results show H0: constant variance, which means there is no heteroscedasticity, and prob>chi2 is 0.092; more than 0.05 suggests that the null hypothesis cannot be rejected. Given the potential problems of multicollinearity among the fund family attributes variables, a diagnostic check was performed using variance inflation factors (VIFs). As a rule of thumb, a VIF >10 is taken as an indicator of the presence of multicollinearity. The diagnostic results show that none of the fund family characteristics variables have a value greater than 10, which suggests that there is no multicollinearity.

Table 5.8:: Breusch-Pagan/ Cook-Weisberg and VIF Test

Variables	VIF	1/ VIF	Heteroscedasticity test
Fund Family Age	1.40	0.7134	H0: Constant variance Prob > Chi2 = 0.092
Number of Funds	1.30	0.7717	
Fund Family Size	1.14	0.8770	
Past Flows	1.13	0.8866	
Dummy Star	-----	-----	
Dummy Poor	-----	-----	
Past Performance	1.04	0.9593	
Total Risk	1.07	0.8954	
Mean VIF	1.18	-----	

Table 5.9 reports the descriptive statistics of the variables used in this thesis. Overall, all the fund families in Saudi Arabia, Malaysia, Indonesia, and Pakistan report negative average returns, for the average returns -0.073 as well as the past returns -0.032. The average age for fund families in all four countries is 18 years. The average size of the fund family for all countries by the average number of funds in a fund family is seven funds, while by the average total net asset value it is USD1850.6 million.

Observation by countries shows that, on average, only Saudi Arabia reports a positive average returns and past returns of fund family, which are 0.1573 and 0.1568

percent, respectively. Other countries report in the average negative average returns and past fund family return performance. Despite negative values, on average, Malaysia reports the highest average returns -0.1251 and past fund family returns -0.1255, while Pakistan reports, on average, the lowest average returns -0.1931 and past fund family return performance -0.1641. Despite having positive returns, Saudi Arabia has the highest return volatility 0.1579, followed by Indonesia 0.0672, Pakistan 0.0552, and Malaysia 0.0451. This indicates that the risk is higher in Saudi Arabia and the lowest in Malaysia. Based on the sample, on average, the age of the fund family in Malaysia is the oldest (26 years), followed by Indonesia (18 years), Saudi Arabia (14 years), and Pakistan (11 years).

This is also reflected in the number of funds in the fund family where Malaysia has the highest average number of funds in the fund family (8.5 funds). Even though Indonesia has the older fund family age compared to Pakistan, the average number of funds in a fund family in Pakistan (8 funds) is higher than that of Saudi Arabia (6 funds) and Indonesia (6 funds). This implies that Pakistan employs a more aggressive strategy in introducing new mutual funds in the country. Consistent with the average age of the fund family and the average number of funds in the fund family, Malaysia also has the largest size of funds by total net asset value USD2267.2 million compared to the other three countries' age in the industry. This is followed by Saudi Arabia USD2214.1 million, Pakistan USD1781 million, and Indonesia USD1530 million. For total risk, Saudi Arabia shows the lower total risk 0.259, while the highest total risk is for Pakistan 0.419, followed by Indonesia 0.378, and then Malaysia 0.335. The high risk in Pakistan reflects the recent government decisions and policies followed in the mutual fund industry.

Table 5.9: Descriptive Statistic

		Fund Family		IFF		CFF		Equality of variance		Equality of means		
		N	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	T. Stat.	P. Value	T. Stat.	P. Value	
Malaysia	N. of Fund	170	165.5 (3.304)	75	71.7 (8.562)	95	88.6 (1.258)	1.426	0.084	4.591	0.000	
	N. of family	20	17.9 (1.552)	8	7.7 (1.132)	12	11.5 (1.865)	1.453	0.080	2.933	0.000	
	Fam Returns	240	-0.125 (0.045)	96	-0.016 (0.044)	144	-0.044 (0.048)	0.112	0.456	1.893	0.031	
	Family age	228	26.4 (1.408)	84	26.83 (1.792)	144	25.1 (1.153)	2.215	0.014	1.508	0.067	
	Fund/ family	228	8.5 (2.682)	96	8.866 (2.372)	132	7.4 (2.437)	-1.24	0.134	-2.93	0.002	
	Family size	228	2267.2 (582.7)	84	1806.9 (548.5)	144	971.1 (151.1)	11.27	0.000	11.38	0.000	
	Past. return	240	-0.125 (0.045)	96	-0.125 (0.044)	144	-0.124 (0.048)	0.360	0.359	2.029	0.022	
	Total risk	240	0.335 (0.147)	96	0.327 (0.157)	144	0.344 (0.134)	-0.88	0.189	-0.63	0.026	
	Indonesia	N. of Fund	83	79.3 (2.718)	34	30.6 (6.006)	49	47.5 (3.175)	5.339	0.000	5.668	0.000
		N. of family	14	12.3 (1.374)	5	4.78 (1.179)	9	8.5 (1.118)	4.424	0.000	4.282	0.000
Fam Returns		168	-0.133 (0.067)	60	-0.106 (0.072)	108	-0.147 (0.054)	3.854	0.000	3.777	0.000	
Family age		156	17.78 (2.120)	60	18.94 (2.995)	96	15.7 (2.746)	2.026	0.022	3.780	0.000	
Fund/ family		168	5.929 (1.036)	60	6 (1.253)	108	5.80 (0.403)	1.032	0.152	1.884	0.032	
Family size		156	1530.3 (218.4)	60	1129.1 (144.7)	96	931.9 (143.1)	9.314	0.000	7.19	0.000	
Past. return		168	-0.132 (0.066)	60	-0.125 (0.071)	108	-0.145 (0.055)	3.863	0.000	3.742	0.000	
Total risk		168	0.378 (0.177)	60	0.396 (0.182)	108	0.355 (0.169)	0.497	0.068	0.048	0.015	
Pakistan		N. of Fund	87	82.8 (2.420)	33	28.5 (2.958)	54	52.8 (3.467)	-0.182	0.429	-0.561	0.293
		N. of family	11	10.81 (1.143)	3	2.62 (1.187)	8	7.31 (1.312)	2.343	0.014	3.745	0.000
	Fam Returns	165	-0.193 (0.055)	36	-0.155 (0.047)	96	-0.163 (0.061)	1.899	0.030	1.917	0.030	
	Family age	165	10.77 (3.328)	36	9.33 (2.428)	96	12.50 (3.922)	-2.95	0.002	-4.65	0.000	
	Fund/ family	165	7.909 (3.269)	36	7.50 (4.750)	96	8.40 (3.585)	-1.21	0.115	-0.59	0.278	
	Family size	153	1780.8 (554.2)	36	1119.6 (536.7)	84	1514 (555)	7.621	0.000	8.429	0.000	
	Past. return	165	-0.164 (0.055)	36	-0.157 (0.047)	96	-0.176 (0.062)	1.497	0.068	1.449	0.076	
	Total risk	165	0.419 (0.269)	36	0.429 (0.280)	96	0.406 (0.257)	0.498	0.310	-0.49	0.311	

Table 5.9, continued

		Fund Family		IFF		CFF		Equality of variance		Equality of means		
		N	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	T. Stat.	P. Value	T. Stat.	P. Value	
Saudi Arabia	N. of Fund	162	156.7 (3.590)	162	156.7 (3.590)	--	--	--	--	--	--	
	N. of family	25	24.8 (1.785)	25	24.8 (1.785)	--	--	--	--	--	--	
	Fam Returns	300	0.157 (0.158)	300	0.157 (0.158)	--	--	--	--	--	--	
	Family age	300	13.86 (2.267)	300	13.86 (2.267)	--	--	--	--	--	--	
	Fund/ family	300	6.48 (2.777)	300	6.48 (2.777)	--	--	--	--	--	--	
	Family size	288	2214.1 (410.4)	288	2214.1 (410.4)	--	--	--	--	--	--	
	Past. return	300	0.156 (0.158)	300	0.156 (0.158)	--	--	--	--	--	--	
	Total risk	300	0.259 (0.221)	300	0.259 (0.221)	--	--	--	--	--	--	
	All	N. of Fund	502	494.3 (7.819)	304	301.4 (9.168)	198	191.2 (8.147)	7.868	0.000	9.970	0.000
		N. of family	70	65.8 (5.742)	41	40.6 (4.481)	29	28.2 (3.955)	5.215	0.000	8.577	0.000
Fam Returns		840	-0.073 (1.235)	492	-0.003 (0.184)	312	-0.147 (0.057)	1.096	0.000	2.340	0.000	
Family age		756	17.74 (1.421)	444	17.73 (1.421)	348	17.76 (2.455)	-2.26	0.012	-1.97	0.000	
Fund/ family		756	7.183 (2.453)	444	7.164 (2.296)	348	7.200 (2.721)	-3.58	0.000	-3.12	0.000	
Family size		756	1850.6 (430.5)	492	1522.5 (944.2)	312	1270 (419.5)	32.42	0.000	43.83	0.000	
Past. return		840	-0.032 (0.051)	492	-0.005 (0.184)	348	-0.147 (0.058)	3.051	0.000	2.697	0.000	
Total risk		840	0.330 (0.211)	492	0.317 (0.221)	348	0.363 (0.183)	-2.19	0.014	-4.97	0.000	

Note: S.D is the Standard deviation in brackets. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Islamic Focused Family (IFF) Vs Conventional Focused Family (CFF)

This section also describes the characteristics of the IFF by country for all four countries in the sample. In terms of fund family returns performance, on average, the IFF in Saudi Arabia provides the highest return performance 0.157 compared to the other countries. The IFF in Malaysia ranks second with -0.016 percent followed by Indonesia -0.106 and Pakistan -0.155. In terms of age, it shows that Malaysia has the

oldest IFF (27 years), followed by Indonesia (19 years), Saudi Arabia (14 years), and Pakistan (9 years). In terms of the number of funds in the IFF, Malaysia has the highest number of funds in the IFF (9 funds) followed by Pakistan (8 funds), Saudi Arabia (6 funds), and Indonesia (6 funds). In terms of total net asset value, Saudi Arabia leads with USD2214 million followed by Malaysia USD1807 million, Indonesia USD1129 million, and Pakistan USD1120 million.

This section describes the characteristics of the IFF compared to the CFF for all countries and by country. Since the sample of the fund families in Saudi Arabia are all focused on Islamic mutual funds, this section excludes Saudi Arabia in the descriptive analysis. On average, for all fund family sample, the IFF reports higher average returns -0.003 and past returns -0.005 compared to the CFF average returns -0.147 and past returns -0.147. This implies that, collectively, for all fund family, despite having negative returns for both types of fund family focus, the IFF average return performance is better than the CFF return performance. The average age of the IFF (17.73 years) is slightly younger than the CFF (17.76 years), which might explain why the number of funds in the IFF (7.1 funds) is slightly lower than the number of funds in the CFF (7.2 funds). Despite being younger in age and having a smaller number of funds in the fund family, the IFF size by total net asset value USD1522.5 million is larger than the CFF size USD1270 million.

Observation by countries reveals that, consistent with the overall fund family sample description on the fund family average returns and past returns, the IFF reports higher average returns and past returns compared to the CFF for the average returns for all the individual countries led by Malaysia (average returns IFF, -0.016; CFF, -0.044; past returns IFF, -0.125 ; CFF, -0.124), Indonesia (average returns IFF, -0.106; CFF, -0.147; past returns IFF, -0.125 ; CFF, -0.145), and Pakistan (average returns IFF, -0.155;

CFF, -0.163; past returns IFF, -0.157; CFF, -0.176). The sample shows that IFF in Malaysia and Indonesia are older than that of the CFF. For example, the IFF in Malaysia is two years older than the CFF, while the IFF in Indonesia is three years older than the CFF. However, the IFF in Pakistan is younger than the CFF by four years. This may imply that the Islamic mutual funds had a foothold in Malaysia and Indonesia earlier than in Pakistan.

The sample also shows that both indicators of the size of the fund family for the IFF are larger than that of the CFF in Malaysia and Indonesia, but the IFF size is smaller than that of the CFF in Pakistan. In Malaysia, for example, the number of funds in the IFF (9 funds) is higher than the number of funds in the CFF (7 funds), and the total net asset value of the IFF USD1806 million is larger than that of the CFF USD971 million. In Indonesia, the number of funds in the IFF (6 funds) is higher than the number of funds in the CFF (5.8 funds), and the total net asset value of the IFF USD1129 million is larger than that of the CFF USD932 million. In contrast to Malaysia and Indonesia, Pakistan shows that the number of funds in the IFF (7.5 funds) is lower than the number of funds in the CFF (8 funds), and the total net asset value of the IFF USD1120 million is smaller than that of the CFF USD1514 million.

Correlation

This sub-section presents Spearman rank and Pearson product-moment correlations for fund family performance and independent and control variables. Table 5.10 shows that the fund family performance is correlated positively with fund family age, fund family size, and Dummy star. This means that the oldest fund families have a better performance than younger families. In addition, the bigger fund families have a better performance than the smallest fund families. Finally, fund families with star funds

have better performance. However, the fund family is correlated negatively with the number of funds in the fund family, and Dummy poor. This suggests that fund families with a smaller number of funds outperform those with a larger number of funds while fund families that experience lower (higher) money flow in the previous month, will have better (poorer) performance. Fund families with poor funds will collectively perform poorly. There is also a strong positive correlation between fund family performance and past fund family performance. Finally, the correlation between the other fund family attributes is relatively low and unlikely to lead to a multicollinearity problem.

Table 5.10: Correlation Matrix

Variable	Family Return	Family Age	N. of Funds	Family Size	Dummy Star	Dummy Poor	Past Return	Total risk
Fund Family Return	1.000	0.301*	-0.104	0.166**	0.430*	-0.271*	0.811*	-0.198*
		(0.001)	(0.341)	(0.053)	(0.010)	(0.040)	(0.002)	(0.020)
Fund Family Age	0.118*	1.000	0.014	-0.102	0.114	0.063	0.273**	0.138*
	(0.006)		(0.070)	(0.057)	(0.061)	(0.080)	(0.050)	(0.020)
Number of Funds	-0.135**	0.187*	1.000	0.037**	0.130**	0.028*	-0.134	0.034**
	(0.051)	(0.000)		(0.054)	(0.052)	(0.004)	(0.350)	(0.050)
Fund Family Size	0.086**	-0.203*	0.345*	1.000	-0.089	-0.011	0.209*	-0.017
	(0.051)	(0.000)	(0.000)		(0.120)	(0.410)	(0.001)	(0.370)
Dummy Star	0.187*	0.060	0.190*	-0.056	1.000	-0.022	0.401*	-0.031
	(0.000)	(0.082)	(0.000)	(0.107)		(0.065)	(0.003)	(0.510)
Dummy Poor	-0.184*	0.075*	0.192*	-0.038	-0.010	1.000	-0.171*	0.033
	(0.000)	(0.030)	(0.000)	(0.273)	(0.782)		(0.001)	(0.180)
Past Returns	0.927*	-0.124*	-0.141*	0.073*	0.029*	-0.150*	1.000	-0.181
	(0.000)	(0.003)	(0.000)	(0.034)	(0.000)	(0.000)		(0.120)
Total Risk	-0.239*	-0.117**	-0.150*	-0.019	-0.003	0.011	-0.227	1.000
	(0.000)	(0.056)	(0.000)	(0.569)	(0.914)	(0.744)	(0.000)	

Note: P-Value in brackets. Spearman rank above the diagonal; Pearson product-moment below diagonal. Asterisks denote significance at the * – .10, ** – .05 and *** – .01 level. T.B is the 3month treasury bills.

Fund Family Performance and Star (Poor) Funds

Overall Fund Family and by Country

This sub-section presents the results of the impact of having star and poor funds on the fund family performance for overall fund family and by individual countries, including 25 families for Saudi Arabia, 20 families for Malaysia, 14 families for

Indonesia, and 11 families for Pakistan. Table 5.11 presents the results of the impact of star and poor funds on the fund family performance for overall fund family and by country. Fund family performance is calculated using the Carhart four-factor model (1997).

There is strong evidence of a positive relationship between past one-month fund family returns and average month fund family return performance for all countries. The increase in 1 percent of previous one-month return performance results in a 0.678, 0.364, 0.579, and 0.358 increase in the average month return performance for the fund family in Saudi Arabia, Malaysia, Indonesia, and Pakistan. This suggests that past returns are able to signal the performance of the management team of the fund family. Alternatively, it may indicate that the return performance of the fund family is persistent within a month period.

Similarly, the significant positive (negative) relationship between Dummy Star (Dummy Poor) and fund family returns shows that the fund families with the current best performance results in better performance while fund families with the poorest performance results in poorer fund family performance. This suggests that the families with star funds outperform those without star funds, which is due to the fund family using the strategy of having at least one-star fund to reduce the cost of advertising and promoting the fund family, and having star funds provides a good signal about the skills and efficiency of the management team of the fund family. On the other hand, there is a significantly negative relationship between fund family performance and dummy poor funds. This suggests that the families with poor funds underperform those without poor funds. This is because the existence of poor funds in the fund family indicates a bad signal about the team management of the fund family.

Control Variables

This sub-section presents the results of the impact control variables on the fund family performance. Table 5.11 presents the results of the impact of fund family attributes on the fund family performance for all fund family and by country. Fund family age and number of funds, have a positive relationship with the fund family returns, while total risk have a negative relationship with the fund family return performance.

Analysis by countries shows that fund family age is significantly positive in influencing fund family performance for all countries except for Saudi Arabia. For Malaysia and Indonesia, every 1 percent increase in fund family age, will result in a 0.008 and 0.004 increase in fund family returns, respectively. Interestingly, the same increase in fund family age will result in 0.015 in fund family return in Pakistan, which is quadruple that of the fund family returns in Southeast Asian countries. This suggests that older fund families in Malaysia, Indonesia, and Pakistan perform better than younger fund families. However, there is no difference between younger and older fund families in Saudi Arabia in that age does not influence the performance of fund families in Saudi Arabia. The positive relationship between age and fund family performance can be explained by the fact that older fund families are able to recruit managers with more experience to improve the fund family performance, while the younger fund family spends more money on advertising, promoting the fund family, and issuing new funds to attract more investors, which may affect the overall performance of the fund families.

Both the number of funds and the total net asset value of a fund family indicate the size of the fund family. There are mixed results in the relationship between fund family size and fund family returns. The relationship between the number of funds in

the fund family and the fund family returns is significantly positive for Saudi Arabia but significantly negative for the rest of the countries in the sample. Every 1 percent increase in the number of funds in the fund family attracts 0.005 of fund family returns in Saudi Arabia. However, fund families from other countries do not behave the same. In fact, every 1 percent increase in the number of funds in the fund family will reduce the fund family returns by 0.006, 0.008, and 0.004 in Malaysia, Indonesia, and Pakistan, respectively. This suggests that managers of fund families in Saudi Arabia are able to manage large fund families with a higher number of fund members, and, at the same time, are able to provide better returns for the fund family. This is because the families with more funds have more investment opportunities and more diversification, and increase the chance of having more star funds, which could improve fund family performance. However, this does not happen in the other countries, which may suggest that families with a large number of funds become hard to manage.

When the fund family size is measured using the total net asset value, the same results appeared for Saudi Arabia (i.e. significant positive relationship) only but the results are different for the rest of the countries. The fund family size is significantly positive for Saudi Arabia, while it is insignificant for Malaysia, Indonesia, and Pakistan. Every 1 percent increase in the total net asset value results in 0.008 percent increase in the fund family returns in Saudi Arabia. This suggests that managers of the larger fund family (both in the number of funds and the total net asset value of the fund family) in Saudi Arabia perform better than smaller families. This is due to the large families having more investment opportunities and more diversification, which could improve fund family performance. The insignificant results for Malaysia, Indonesia, and Pakistan may be due to the fund managers' strategy in that they prefer to limit the growth of the fund family size as growth beyond a certain limit would impede decision-making.

Therefore, fund family are using the strategy of issuing new funds that are named after their successful precursor, letting the poor-performing funds fade away.

Finally, the total risk is only negatively significant for Pakistan -0.026. The results indicate that every increase of 1 percent on total risk, leads to a decrease in the performance by 0.026 in Pakistan. The justification for this is that more total risk means more volatility in the price, which reduces the ability of managers to choose the appropriate timing to obtain the best selection process for funds.

Islamic Focused Family (IFF) VS. Conventional Focused Family (CFF)

This section discusses whether there is a difference between the impacts of having star and poor funds on fund family performance between Islamic focused families (IFF) and conventional focused family (CFF). The same Table 5.11 presents the results of the impact of star and poor on the IFF and CFF performance. The analysis of IFF for Saudi Arabia is similar to the analysis in the previous section as the sample of fund families in Saudi Arabia own Islamic mutual funds amounting to more than two-thirds of their fund family portfolios. Thus, this section focuses on the rest of the sample countries in the study.

Generally, having one or more star mutual fund performers in a fund family helps to boost the return of the overall fund family. This test using a variable in the regression called Dummy Star. The results find that, for all fund family sample, Dummy Star has a significant positive relationship with fund family performance for both IFF and CFF in all countries. Similarly, having one or more poor mutual fund performers in the fund family will drive down the overall performance of the fund family. The results also support this statement but only for the IFF in Saudi Arabia, Indonesia, and Pakistan, and the CFF in all countries in the sample. Surprisingly, having poor performing mutual

funds does not affect return performance for the IFF in Malaysia. That means having poor funds in Malaysian IFF does not provide a bad signal about the fund family management team and accordingly does not effects their performance. Finally, the past fund family returns consistently have a positive relationship with the IFF and CFF in all countries in the study. This implies performance persistence for the one-month period.

Table 5.11: Fund Family Performance and Fund Family Attributes

	Variables	Fund family	IFF	CFF
Malaysia	Constant	-0.048 (0.005)	-0.210 (0.048)	-0.096 (0.020)
	Family Age	0.008 (0.037)**	-0.002 (0.668)	0.006 (0.068)
	Number fund	-0.006 (0.381)	-0.004 (0.719)	0.005 (0.036)*
	Family Size	-0.015 (0.648)	0.269 (0.273)	-0.059 (0.512)
	Dummy Star	0.031 (0.012)**	0.027 (0.016)**	0.015 (0.010)**
	Dummy Poor	-0.024 (0.010)**	-0.036 (0.191)	-0.030 (0.013)**
	Past Family Returns	0.364 (0.000)***	0.234 (0.000)***	0.508 (0.000)***
	Total risk	0.017 (0.102)	0.019 (0.194)	-0.096 (0.020)
	Prob > F	0.0000	0.0000	0.000
	Adjusted. R ²	0.68	0.65	0.83
	LM Test (Null hypothesis H0: Pooled)	221.22 (0.001)**	216.1 (0.002)**	246.4 (0.000)**
	Hausman Test (Null hypothesis H0: Random Effect)	312.31 (0.000)**	304.21 (0.620)	198.1 (0.001)**
	Indonesia	Constant	-0.004 (0.019)	-0.282 (0.000)
Family Age		0.004 (0.043)**	-0.005 (0.346)	0.003 (0.009)**
Number fund		-0.008 (0.017)*	0.014 (0.873)	-0.003 (0.907)
Family Size		-0.031 (0.638)	-0.416 (0.004)**	0.029 (0.313)
Dummy Star		0.044 (0.010)**	0.033 (0.011)**	0.015 (0.020)**
Dummy Poor		-0.027 (0.011)**	-0.025 (0.021)**	-0.029 (0.024)**
Past Family Returns		0.579 (0.000)**	0.542 (0.000)***	0.098 (0.000)***
Total risk		-0.050 (0.120)	0.056 (0.039)**	-0.033 (0.417)
Prob > F		0.000	0.0005	0.0001
Adjusted. R ²		0.67	0.50	0.53
LM Test (Null hypothesis H0: Pooled)		221.22 (0.001)**	216.1 (0.002)**	246.4 (0.000)**
Hausman Test (Null hypothesis H0: Random Effect)		312.31 (0.000)**	304.21 (0.620)	198.1 (0.001)**
Pakistan		Constant	-0.153 (0.002)	-0.198 (0.000)
	Family Age	0.015 (0.000)*	0.005 (0.000)*	0.003 (0.064)
	Number fund	-0.004 (0.025)*	0.005 (0.082)	-0.004 (0.047)**
	Family Size	0.045 (0.052)	-0.029 (0.745)	0.419 (0.041)**
	Dummy Star	0.031 (0.000)**	0.025 (0.000)**	0.016 (0.041)**
	Dummy Poor	-0.035 (0.000)**	-0.042 (0.000)**	-0.029 (0.033)**
	Past Family Returns	0.358 (0.000)***	0.164 (0.024)***	0.564 (0.000)***
	Total risk	-0.026 (0.026)**	-0.043 (0.001)**	0.004 (0.786)
	Prob > F	0.0000	0.0000	0.0001
	Adjusted. R ²	0.55	0.59	0.69
	LM Test (Null hypothesis H0: Pooled)	221.12 (0.000)**	281.3 (0.006)*	229.2 (0.004)**
	Hausman Test (Null hypothesis H0: Random Effect)	291.11 (0.003)**	199.76 (0.701)	354.5 (0.001)**

Table 5.11, continued

	Variables	Fund family	IFF	CFF
Saudi Arabia	Constant	0.031 (0.437)	0.031 (0.437)	---
	Family Age	0.009 (0.121)	0.009 (0.121)	---
	Number fund	0.005 (0.020)*	0.005 (0.020)*	---
	Family Size	0.008 (0.022)**	0.008 (0.022)**	---
	Dummy Star	0.074 (0.000)**	0.074 (0.000)**	---
	Dummy Poor	-0.057 (0.014)**	-0.057 (0.014)**	---
	Past Family Returns	0.678 (0.000)***	0.678 (0.000)***	---
	Total risk	0.031 (0.437)	0.031 (0.437)	---
	Prob > F	0.0000	0.0000	---
	Adjusted. R²	0.66	0.66	---
	LM Test (Null hypothesis H0: Pooled)	225.12 (0.002)**	186.1 (0.000)**	226.1 (0.001)**
	Hausman Test (Null hypothesis H0: Random Effect)	312.11 (0.000)**	229.1 (0.601)	251.2 (0.000)**
	All	Constant	-0.051 (0.298)	0.015 (0.818)
Family Age		0.001 (0.050)*	0.010 (0.150)	0.005 (0.032)**
Number fund		0.001 (0.017)*	0.004 (0.018)*	-0.002 (0.320)
Family Size		0.029 (0.611)	-0.061 (0.641)	0.033 (0.002)**
Dummy Star		0.029 (0.001)**	0.025 (0.001)**	0.058 (0.014)**
Dummy Poor		-0.019 (0.002)**	-0.019 (0.069)	-0.047 (0.050)**
Past Family Returns		0.906 (0.000)***	0.234 (0.000)***	0.475 (0.000)***
Total risk		-0.054 (0.000)**	0.067 (0.000)**	-0.014 (0.252)
Prob > F		0.0000	0.000	0.000
Adjusted. R²		0.72	0.69	0.68
LM Test (Null hypothesis H0: Pooled)		125.52 (0.002)**	186.1 (0.002)**	326.6 (0.000)**
Hausman Test (Null hypothesis H0: Random Effect)		262.41 (0.001)**	202.41 (0.520)	294.5 (0.000)**

Control Variables

This section discusses the impact of control variables on Islamic and conventional focused family performance. For Malaysia and Indonesia, even though, in general, age is an important determinant for a fund family return performance, it is only significant for CFF but not for IFF. Every 1% increase in age will attract 0.006 returns in CFF in Malaysia and 0.003 for Indonesian CFF. Contradicting these results, age is only an important determinant for IFF but not CFF in Pakistan. This could be because the Islamic fund industry in Pakistan is young compared to other countries.

The overall analysis of the impact of a number of funds on fund family performance in Malaysia, Indonesia, and Pakistan shows that this variable has an inverse relationship with the performance of fund family except for Saudi Arabia (direct

relationship). Further analysis shows that, on average, the number of funds in the fund family only positively affects CFF returns but not IFF returns. For every 1% percent increase in the number of funds managed in the fund, the fund family will attract a 0.005 return in the CFF in Malaysia. The higher the number of funds managed the more effective it would be in that it would increase return performance in the CFF. For Pakistan, overall, the increase in the number of funds will deteriorate the return performance of the fund family. However, further analysis shows that the increasing number of funds will also negatively affect the CFF. Every 1% increase in the number of funds managed will reduce the CFF performance by 0.004. For Indonesia, even though, in general, the number funds are an important determinant for fund family return performance, it is insignificant for the CFF and IFF.

The size of a fund family based on the total net asset value has a significant positive relationship with the performance of a fund family in Pakistan, but is not significant in Malaysia and Indonesia. Further scrutiny shows that the total net asset value only has a reverse relationship with the IFF in Indonesia and a direct relationship for the CFF in Pakistan. Every 1% increase in the total net asset value will reduce the IFF performance by 0.416 in Indonesia, but increase the CFF in Pakistan by 0.419.

Finally, similar to the overall fund family sample of Pakistan, the total risk is negatively significant for the IFF of Pakistan and the CFF of Malaysia, which means that the managers of these families have a poor ability to choose the appropriate timing to obtain the best selection process for funds due to the high volatility. In contrast, the IFF in Indonesia has a positively significant relation with the total risk 0.056, which means a 1 percent increase in the total risk, leads to an increase in fund family performance of 0.056. This could be due to the fact that the Islamic investment performs better during the bear market.

In summary, the results concluded that the impact of fund family attributes on fund family performance is different between IFF and CFF. This means that some attributes have an impact on both IFF and CFF. For example, dummy star, past returns, and past flows. At the same time, other attributes impact on one type of fund family, for example, dummy poor and fund family age. For the IFF and CFF analysis, the results of the impact of the fund family attributes and fund family performance model support that differ between determinates of IFF and CFF performance.

5.2.5 Fund Family Performance Persistence

Performance persistence is investigated at the fund family level, that is, if investing depend on past information of better fund family performance brings any benefit to investors. The basis for this analysis is that investors resort to be affected by the advertisement of better performance. Fund families offensively advertise their past better performing funds in an attempt to entice investors not only to the better performing funds but also to other funds managed by the same fund family. The vigorous advertising efforts make the funds more prominent in these families and investors continue to assign their money to those fund families. Investors prefer to select a particular fund family rather than an individual fund (Cheng, Pi & Wort, 1999). This section attempts to establish the relationship between the past better performance of the fund family and its future better performance, measured by the persistence of performance. The methodology of a contingency table, following Brown and Goetzmann (1995), Malkiel (1995), and Cheng et al. (1999), is applied in the study of fund family performance persistence.

Overall Fund Family and by Country

This sub-section tests the performance persistence at fund family level for the overall fund family sample 70 families. This section includes three types of analysis: first, monthly interval; second, six-month interval; and third, yearly interval.

Monthly Period

This sub-section tests whether well-performing fund families persist to perform well in the following period, and then suggests that the hot-hand fund families exist, and poor-performing fund families persist to perform poorly in the following period, and then shows the presence of cold-hand fund families. A fund family is deemed to be hot hand or have positive performance persistence if it has more than a 50 percent chance of repeating the above-median returns of the previous month in the following month (Cheng et al., 1999). Hot-hand is described as any good performing of the fund family in the most recent period which remains a better performer in the near term. Icy-hand is described as any of the fund family's poor performances in the most recent period that remains the poor performer in the near term.

Table 5.12 shows the winning persistence of each fund family during the twelve-year period from January 2007 to December 2018 using a monthly rolling period. The z-statistic, which is normally distributed with zero mean and a standard deviation of 1.0, is computed to investigate the significance of fund family returns persistence. The repeat winner ratio, for the fund family 1 of 78 percent of winners in month 1 are winners in month 2, is 80 (win-win) of 102 (win-win + win-lose). The repeat loser ratio, for the fund family 1 of 49 percent of losers in month 1 are losers in month 2, is calculated as 20 (lose-lose) of 41 (lose-lose + lose-win). The negative sign of the repeat winner z-statistic indicates that fund family 1 becomes a loser following the winning month.

The positive sign of the repeat winner z-statistic exhibits that 17 of the 70 fund families are winners in the month immediately after a winning month, but of which only one fund family is statistically significant. Conversely, 52 of the 70 fund families are reported to experience a losing month immediately after the winning month, as shown by a negative repeat winner ratio; but of which only one fund family is statistically significant. The positive sign of the repeat loser z-statistic exhibits that 52 of the 70 fund families are losers in the month immediately after a losing month, but of which only two families are statistically significant. Conversely, 17 of the 70 fund families are reported to experience a winning month immediately after the losing month, as shown by a negative repeat winner ratio, but none of these are significant.

The repeat winner ratio of the average for all families is reported in the last row in Table 5.12. It shows that 71 percent of all winner families in month 1 are winners in month 2, that is, 3416 (win-win) of 4831 (win-win + win-lose). The repeat winner for two successive months is significant where the z-statistic equals 1.8873 more than the critical value "1.645". The negative sign of the repeat winner z-statistic indicates that the fund families become a loser following the winning month. The repeat loser ratio of the average for all families is reported in the last row in Table 5.12. It shows a negative persistence, in that 74 percent of all winner families in month 1 are winners in month 2, that is, 3796 (lose-lose) of 5140 (lose-lose + lose-win). The repeat loser for two successive months is significant where the z-statistic equals 1.9367 more than the critical value "1.645". Therefore, the icy-hand phenomenon in fund families is significant. It is concluded that poor-performing fund families continue to perform worse than others in the following month. The overall result of negative performance persistence in fund families is significant and the positive performance persistence is insignificant.

For the individual country analysis, Table 5.12 shows that the four countries have significantly superior persistence at the one-month period, according to the Z-statistic test. The best performer in performance persistence is Saudi Arabia (1.9160) and then Malaysia (1.8756) with a small difference between them. In Table 5.12, for Saudi Arabia, the repeat winner z-statistic shows that 2 families of 23 families have a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. While, there is one fund family of 18 have a significant positive repeat loser z-statistic, implying the persistence of its inferior performance for one-months. Second, for Malaysia, the repeat winner z-statistic shows that one fund family of 3 families has a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. While, there is one fund family of 20 have a significant positive repeat loser z-statistic, implying the persistence of its inferior performance for one-months. Third, for Indonesia, the repeat winner z-statistic shows that one fund family of 5 families has a significant positive repeat winner z-statistic, indicating the persistence of its superior performance, and the same results for repeat loser z-statistic. Finally, for Pakistan, the same results of Indonesia.

Table 5.12: Fund Family Performance Persistence (One Month)

Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
		W	L						
Family 1	Winner	80	21	0.78	0.49	-0.2132	0.543	0.2182	0.438
	Loser	22	20						
Family 2	Winner	81	20	0.80	0.52	0.0000	0.161	0.0000	0.543
	Loser	20	22						
Family 3	Winner	138	2	0.99	0.50	1.0000	0.433	-0.7071	0.712
	Loser	1	2						
Family 4	Winner	137	3	0.99	0.40	2.0000	0.021**	-1.1547	0.127
	Loser	1	2						
Family 5	Winner	56	30	0.64	0.45	-0.3536	0.145	0.3651	0.091
	Loser	32	25						
Family 6	Winner	130	5	0.98	0.50	1.1547	0.228	-0.8944	0.078
	Loser	3	5						
Family 7	Winner	115	6	0.94	0.50	-0.3780	0.533	0.4082	0.069
	Loser	7	6						
Family 8	Winner	115	7	0.95	0.46	0.4082	0.744	-0.3780	0.084
	Loser	6	6						
Family 9	Winner	100	10	0.93	0.58	1.1339	0.575	-0.9487	0.156
	Loser	7	14						
Family 10	Winner	11	23	0.28	0.79	-1.1142	0.066	1.2511	0.610
	Loser	29	89						
Family 11	Winner	13	5	0.62	0.96	-1.0607	0.091	1.3416	0.083
	Loser	8	115						
Family 12	Winner	4	2	0.50	0.99	-1.0000	0.074	1.4142	0.041***
	Loser	4	133						
Family 13	Winner	130	4	0.98	0.64	1.4142	0.021***	-1.0000	0.410
	Loser	2	7						
Family 14	Winner	130	4	0.96	0.50	-0.4472	0.127	0.5000	0.535
	Loser	5	4						
Family 15	Winner	23	21	0.51	0.79	-0.2132	0.091	0.2182	0.781
	Loser	22	77						
Family 16	Winner	121	7	0.94	0.50	-0.3536	0.078	0.3780	0.071
	Loser	8	7						
Family 17	Winner	93	14	0.85	0.59	-0.5000	0.069	0.5345	0.812
	Loser	16	20						
Family 18	Winner	135	2	0.99	0.71	1.0000	0.591	-0.7071	0.071
	Loser	1	5						
Family 19	Winner	126	4	0.98	0.73	1.4142	0.031**	-1.0000	0.810
	Loser	2	11						
Family 20	Winner	122	2	0.95	0.71	-1.8898	0.001**	3.5355	0.002**
	Loser	7	5						
Family 21	Winner	11	16	0.34	0.86	-1.0911	0.801	1.2500	0.543
	Loser	21	95						
Family 22	Winner	135	1	0.99	0.83	-0.7071	0.700	1.0000	0.712
	Loser	2	5						
Family 23	Winner	82	25	0.75	0.26	-0.3849	0.090	0.4000	0.579
	Loser	27	9						
Family 24	Winner	90	22	0.82	0.33	0.4472	0.065	-0.4264	0.068
	Loser	20	11						
Family 25	Winner	43	28	0.59	0.60	-0.3651	0.227	0.3780	0.091
	Loser	30	42						

Saudi Arabia

Table 5.12, continued

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
			W	L						
Saudi Arabia	All Family	Winner	2106	284	0.82	0.72	1.9160	0.027*	-1.1133	0.059
		Loser	303	737						
	All IFF	Winner	1950	301	0.85	0.71	1.8160	0.031*	-1.0136	0.062
		Loser	324	758						
	All CFF	-----	-----	-----	-----	-----	-----	-----	-----	-----
Malaysia	Family 26	Winner	18	25	0.41	0.75	-0.1961	0.693	0.2000	0.801
		Loser	26	74						
	Family 27	Winner	14	30	0.33	0.71	0.3780	0.344	-0.3651	0.607
		Loser	28	74						
	Family 28	Winner	5	15	0.23	0.88	-0.4851	0.081	0.5164	0.120
		Loser	17	106						
	Family 29	Winner	30	28	0.50	0.66	-0.3651	0.185	0.3780	0.801
		Loser	30	55						
	Family 30	Winner	5	14	0.24	0.89	-0.5000	0.191	0.5345	0.770
		Loser	16	108						
	Family 31	Winner	21	30	0.40	0.67	-0.1796	0.442	0.1826	0.082
		Loser	31	61						
	Family 32	Winner	14	29	0.32	0.71	-0.1826	0.654	0.1857	0.565
		Loser	30	70						
	Family 33	Winner	13	24	0.33	0.77	-0.3922	0.841	0.4082	0.071
		Loser	26	80						
	Family 34	Winner	2	2	0.33	0.99	-1.0000	0.450	1.4142	0.012***
		Loser	4	135						
	Family 35	Winner	21	27	0.45	0.72	0.1961	0.440	-0.1925	0.071
		Loser	26	69						
	Family 36	Winner	29	26	0.52	0.70	-0.1925	0.561	0.1961	0.810
		Loser	27	61						
	Family 37	Winner	15	27	0.34	0.72	-0.3714	0.410	0.3849	0.801
		Loser	29	71						
	Family 38	Winner	15	26	0.36	0.74	-0.1925	0.535	0.1961	0.700
		Loser	27	75						
	Family 39	Winner	17	25	0.40	0.75	-0.1961	0.781	0.2000	0.090
		Loser	26	75						
	Family 40	Winner	35	29	0.54	0.63	-0.1826	0.171	0.1857	0.065
		Loser	30	49						
	Family 41	Winner	12	24	0.32	0.77	-0.2000	0.412	0.2041	0.227
		Loser	25	82						
	Family 42	Winner	9	24	0.26	0.78	-0.2000	0.071	0.2041	0.654
		Loser	25	85						
	Family 43	Winner	18	33	0.35	0.64	-0.1715	0.810	0.1741	0.083
		Loser	34	58						
Family 44	Winner	15	20	0.39	0.81	-0.6255	0.093	0.6708	0.540	
	Loser	23	85							
Family 45	Winner	13	24	0.33	0.77	-0.3922	0.519	0.4082	0.230	
	Loser	26	80							
All Family	Winner	321	482	0.38	0.76	1.8756	0.002**	-1.0791	0.921	
	Loser	506	1553							
All IFF	Winner	172	258	0.39	0.77	1.9743	0.002**	-0.7321	0.921	
	Loser	269	877							
All CFF	Winner	169	226	0.41	0.74	1.9931	0.003**	1.9915	0.041**	
	Loser	239	654							

Table 5.12, continued

Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
		W	L						
Family 46	Winner	2	7	0.18	0.95	-0.6667	0.061	0.7559	0.661
	Loser	0	125						
Family 47	Winner	9	31	0.22	0.69	-0.1768	0.346	0.1796	0.740
	Loser	32	70						
Family 48	Winner	26	32	0.44	0.62	-0.1741	0.330	0.1768	0.330
	Loser	33	52						
Family 49	Winner	118	10	0.91	0.29	-0.3015	0.755	0.3162	0.541
	Loser	11	4						
Family 50	Winner	70	33	0.69	0.20	0.1768	0.114	-0.1741	0.540
	Loser	32	8						
Family 51	Winner	120	10	0.93	0.29	0.3333	0.094	-0.3162	0.871
	Loser	9	4						
Family 52	Winner	29	30	0.48	0.64	-0.1796	0.0691	0.1826	0.720
	Loser	31	53						
Family 53	Winner	23	32	0.41	0.63	-0.1741	0.551	0.1768	0.076
	Loser	33	55						
Family 54	Winner	6	7	0.38	0.94	-0.9487	0.767	1.1339	0.750
	Loser	10	120						
Family 55	Winner	105	17	0.88	0.26	0.5164	0.453	-0.4851	0.765
	Loser	15	6						
Family 56	Winner	15	36	0.29	0.60	-0.1644	0.792	0.1667	0.437
	Loser	37	55						
Family 57	Winner	27	33	0.46	0.61	0.1768	0.095	-0.1741	0.543
	Loser	32	51						
Family 58	Winner	5	18	0.21	0.85	-0.2294	0.087	0.2357	0.643
	Loser	19	101						
Family 59	Winner	70	18	0.80	0.68	0.2425	0.140	-0.2357	0.095
	Loser	17	38						
All Family	Winner	625	314	0.66	0.70	1.7357	0.021***	-0.3362	0.065
	Loser	320	742						
All IFF	Winner	137	208	0.38	0.73	1.9935	0.021**	-0.1296	0.065
	Loser	217	581						
All CFF	Winner	397	129	0.76	0.61	1.0941	0.121	1.9521	0.041***
	Loser	124	208						
Family 60	Winner	30	25	0.52	0.71	-0.5669	0.320	0.6000	0.191
	Loser	28	60						
Family 61	Winner	16	19	0.47	0.83	0.2357	0.501	-0.2294	0.275
	Loser	18	90						
Family 62	Winner	4	15	0.17	0.88	-0.9177	0.500	1.0328	0.401
	Loser	19	105						
Family 63	Winner	5	18	0.20	0.85	-0.4472	0.190	0.4714	0.720
	Loser	20	100						
Family 64	Winner	22	30	0.41	0.66	-0.3536	0.171	0.3651	0.501
	Loser	32	59						
Family 65	Winner	18	20	0.44	0.80	-0.6255	0.241	0.6708	0.721
	Loser	23	82						
Family 66	Winner	34	30	0.52	0.61	-0.3536	0.540	0.3651	0.654
	Loser	32	47						

Table 5.12, continued

Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value	
		W	L							
Pakistan	Family 67	Winner	24	30	0.44	0.62	-0.1796	0.095	0.1826	0.095
		Loser	31	48						
	Family 68	Winner	36	28	0.55	0.64	-0.3651	0.086	0.3780	0.743
		Loser	30	49						
	Family 69	Winner	25	18	0.56	0.82	-0.4472	0.321	0.4714	0.542
		Loser	20	80						
	Family 70	Winner	35	31	0.51	0.59	-0.3482	0.954	0.3592	0.951
		Loser	33	44						
	All Family	Winner	249	264	0.57	0.74	-2.2517	0.031**	1.9630	0.010**
		Loser	186	764						
	All IFF	Winner	145	148	0.47	0.72	-0.3461	0.631	0.8123	0.090
		Loser	159	396						
	All CFF	Winner	115	126	0.45	0.72	1.0321	0.60	0.8216	0.192
		Loser	137	337						
	Whole Sample	Winner	3416	1344	0.71	0.74	-1.8875	0.032**	1.9367	0.011**
		Loser	1415	3796						
Whole Sample IFF	Winner	2560	898	0.72	0.74	2.0137	0.004**	1.1032	0.075	
	Loser	948	2591							
Whole Sample CFF	Winner	681	481	0.57	0.71	1.0134	0.437	1.9326	0.004**	
	Loser	500	1199							

Note: IFF is Islamic focused family and CFF is conventional focused family. For the details of the IFF and CFF results by fund family see appendix 4.

Longer Period (Six-Month)

Next, performance persistence is assessed for a longer return rolling period of six months. Table 5.13 reports the winning and losing persistence of each fund family for the period from January 2007 to December 2018 using a semi-annual rolling period. The reported repeat winner z-statistic shows that 5 families out of 25 families have a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. On the other hand, 8 families out of 39 have a significant positive repeat loser z-statistic, thereby implying the persistence of its inferior performance for six-months.

The repeat winner ratio of the average for all families shows that 71 percent of all winner families in the first semi-annual period are winners in the subsequent semi-annual period. It is insignificant where the z-statistics equals 1.3122 less than the critical

value. The repeat loser ratio of the average for all families is reported as 75 percent of all loser families in the first semi-annual period are losers in the subsequent semi-annual period. It is also insignificant, where the z-statistic equals 1.4455 less than the critical value.

For the individual country analysis, unlike the results in the whole sample analysis section, it shows Malaysia has a significant winning persistence at the six-month period (1.9081). In Table 5.13. First, for Saudi Arabia, the repeat winner z-statistic shows that 5 families of 23 families have a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. While there are two families of 9 have a significant positive repeat loser z-statistic, implying the persistence of its inferior performance for one-months. Second, for Malaysia and Pakistan, the z-statistic show that no fund family has a significant positive repeat winner and loser z-statistic, indicating no persistence of its superior performance. Third, for Indonesia, the repeat winner z-statistic shows that two families of 7 families have a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. While there are 6 families of 11 have a significant positive repeat loser z-statistic, implying the persistence of its inferior performance for one-months.

Table 5.13: Fund Family Performance Persistence (Six-Month)

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value																																																																																																																																																																																																																																																																																																																	
			W	L																																																																																																																																																																																																																																																																																																																							
			Saudi Arabia	Family 1							Winner	9	5	0.60	0.38	-0.4082	0.543	0.4472	0.478																																																																																																																																																																																																																																																																																																								
Loser	6	3		Family 2	Winner	10	6	0.67	0.25	0.4472	0.167	-0.4082	0.523							Loser	5	2	Family 3	Winner	19	2	0.95	0.33	1.0000	0.437	-0.7071	0.742	Loser	1	1	Family 4	Winner	18	3	0.95	0.25	2.0000	0.031**	-1.1547	0.157	Loser	1	1	Family 5	Winner	13	4	0.72	0.20	-0.4472	0.195	0.5000	0.081	Loser	5	1	Family 6	Winner	16	3	0.94	0.40	2.0000	0.038**	-1.1547	0.068	Loser	1	2	Family 7	Winner	20	0	0.87	-----	-1.7321	0.043***	-----	-----	Loser	3	0	Family 8	Winner	17	2	0.94	0.60	1.0000	0.712	-0.7071	0.085	Loser	1	3	Family 9	Winner	13	2	0.72	0.60	-1.3416	0.579	2.1213	0.016**	Loser	5	3	Family 10	Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082
Family 2	Winner	10		6	0.67	0.25	0.4472							0.167	-0.4082	0.523																																																																																																																																																																																																																																																																																																											
Loser	5	2		Family 3				Winner	19	2	0.95	0.33	1.0000				0.437	-0.7071	0.742	Loser	1	1	Family 4	Winner	18	3	0.95	0.25	2.0000	0.031**	-1.1547	0.157	Loser	1	1	Family 5	Winner	13	4	0.72	0.20	-0.4472	0.195	0.5000	0.081	Loser	5	1	Family 6	Winner	16	3	0.94	0.40	2.0000	0.038**	-1.1547	0.068	Loser	1	2	Family 7	Winner	20	0	0.87	-----	-1.7321	0.043***	-----	-----	Loser	3	0	Family 8	Winner	17	2	0.94	0.60	1.0000	0.712	-0.7071	0.085	Loser	1	3	Family 9	Winner	13	2	0.72	0.60	-1.3416	0.579	2.1213	0.016**	Loser	5	3	Family 10	Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5							
Family 3	Winner	19		2	0.95	0.33	1.0000	0.437	-0.7071	0.742																																																																																																																																																																																																																																																																																																																	
Loser	1	1		Family 4							Winner	18	3	0.95	0.25	2.0000	0.031**	-1.1547	0.157	Loser	1	1	Family 5	Winner	13	4	0.72	0.20	-0.4472	0.195	0.5000	0.081	Loser	5	1	Family 6	Winner	16	3	0.94	0.40	2.0000	0.038**	-1.1547	0.068	Loser	1	2	Family 7	Winner	20	0	0.87	-----	-1.7321	0.043***	-----	-----	Loser	3	0	Family 8	Winner	17	2	0.94	0.60	1.0000	0.712	-0.7071	0.085	Loser	1	3	Family 9	Winner	13	2	0.72	0.60	-1.3416	0.579	2.1213	0.016**	Loser	5	3	Family 10	Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																				
Family 4	Winner	18		3	0.95	0.25	2.0000	0.031**	-1.1547	0.157																																																																																																																																																																																																																																																																																																																	
Loser	1	1		Family 5							Winner	13	4	0.72	0.20	-0.4472	0.195	0.5000	0.081	Loser	5	1	Family 6	Winner	16	3	0.94	0.40	2.0000	0.038**	-1.1547	0.068	Loser	1	2	Family 7	Winner	20	0	0.87	-----	-1.7321	0.043***	-----	-----	Loser	3	0	Family 8	Winner	17	2	0.94	0.60	1.0000	0.712	-0.7071	0.085	Loser	1	3	Family 9	Winner	13	2	0.72	0.60	-1.3416	0.579	2.1213	0.016**	Loser	5	3	Family 10	Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																	
Family 5	Winner	13		4	0.72	0.20	-0.4472	0.195	0.5000	0.081																																																																																																																																																																																																																																																																																																																	
Loser	5	1		Family 6							Winner	16	3	0.94	0.40	2.0000	0.038**	-1.1547	0.068	Loser	1	2	Family 7	Winner	20	0	0.87	-----	-1.7321	0.043***	-----	-----	Loser	3	0	Family 8	Winner	17	2	0.94	0.60	1.0000	0.712	-0.7071	0.085	Loser	1	3	Family 9	Winner	13	2	0.72	0.60	-1.3416	0.579	2.1213	0.016**	Loser	5	3	Family 10	Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																														
Family 6	Winner	16		3	0.94	0.40	2.0000	0.038**	-1.1547	0.068																																																																																																																																																																																																																																																																																																																	
Loser	1	2		Family 7							Winner	20	0	0.87	-----	-1.7321	0.043***	-----	-----	Loser	3	0	Family 8	Winner	17	2	0.94	0.60	1.0000	0.712	-0.7071	0.085	Loser	1	3	Family 9	Winner	13	2	0.72	0.60	-1.3416	0.579	2.1213	0.016**	Loser	5	3	Family 10	Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																											
Family 7	Winner	20		0	0.87	-----	-1.7321	0.043***	-----	-----																																																																																																																																																																																																																																																																																																																	
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Loser	1	3		Family 9							Winner	13	2	0.72	0.60	-1.3416	0.579	2.1213	0.016**	Loser	5	3	Family 10	Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																					
Family 9	Winner	13		2	0.72	0.60	-1.3416	0.579	2.1213	0.016**																																																																																																																																																																																																																																																																																																																	
Loser	5	3		Family 10							Winner	4	4	0.44	0.71	-0.4472	0.068	0.5000	0.612	Loser	5	10	Family 11	Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																		
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Loser	5	10		Family 11							Winner	4	2	0.67	0.88	0.0000	0.093	0.0000	0.087	Loser	2	15	Family 12	Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																															
Family 11	Winner	4		2	0.67	0.88	0.0000	0.093	0.0000	0.087																																																																																																																																																																																																																																																																																																																	
Loser	2	15		Family 12							Winner	3	1	0.43	0.94	-1.5000	0.044***	3.0000	0.041**	Loser	4	15	Family 13	Winner	15	3	0.79	0.25	-0.5000	0.221	0.5774	0.110	Loser	4	1	Family 14	Winner	17	3	0.94	0.40	2.0000	0.027**	-1.1547	0.335	Loser	1	2	Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281	Loser	3	14	Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																												
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Family 15	Winner	4	2	0.57	0.88	-0.5774	0.091	0.7071	0.281																																																																																																																																																																																																																																																																																																																		
Loser	3	14	Family 16							Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171	Loser	1	0	Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																	
Family 16	Winner	21	1	0.95	0.00	0.0000	0.078	0.0000	0.171																																																																																																																																																																																																																																																																																																																		
Loser	1	0	Family 17							Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112	Loser	1	1	Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																														
Family 17	Winner	19	2	0.95	0.33	1.0000	0.069	-0.7071	0.112																																																																																																																																																																																																																																																																																																																		
Loser	1	1	Family 18							Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471	Loser	1	2	Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																											
Family 18	Winner	18	2	0.95	0.50	1.0000	0.591	-0.7071	0.471																																																																																																																																																																																																																																																																																																																		
Loser	1	2	Family 19							Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710	Loser	2	2	Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																																								
Family 19	Winner	16	3	0.89	0.40	0.7071	0.331	-0.5774	0.710																																																																																																																																																																																																																																																																																																																		
Loser	2	2	Family 20							Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302	Loser	1	0	Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																																																					
Family 20	Winner	21	1	0.95	0.00	0.0000	0.091	0.0000	0.302																																																																																																																																																																																																																																																																																																																		
Loser	1	0	Family 21							Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583	Loser	3	2	Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																																																																		
Family 21	Winner	14	4	0.82	0.33	0.5774	0.801	-0.5000	0.583																																																																																																																																																																																																																																																																																																																		
Loser	3	2	Family 22							Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742	Loser	1	4	Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																																																																															
Family 22	Winner	15	3	0.94	0.57	2.0000	0.001**	-1.1547	0.742																																																																																																																																																																																																																																																																																																																		
Loser	1	4	Family 23							Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559	Loser	2	1	Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																																																																																												
Family 23	Winner	17	3	0.89	0.25	0.7071	0.091	-0.5774	0.559																																																																																																																																																																																																																																																																																																																		
Loser	2	1	Family 24							Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048	Loser	1	1	Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																																																																																																									
Family 24	Winner	19	2	0.95	0.33	1.0000	0.067	-0.7071	0.048																																																																																																																																																																																																																																																																																																																		
Loser	1	1	Family 25							Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095	Loser	6	5																																																																																																																																																																																																																																																																																																						
Family 25	Winner	7	5	0.54	0.50	-0.4082	0.247	0.4472	0.095																																																																																																																																																																																																																																																																																																																		
Loser	6	5																																																																																																																																																																																																																																																																																																																									

Table 5.13, continued

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value																																																																																																																																																																																																																																																																																																																																						
			W	L																																																																																																																																																																																																																																																																																																																																												
Saudi Arabia	All Family	Winner	343	68	0.83	0.57	-0.2392	0.427	0.2434	0.079																																																																																																																																																																																																																																																																																																																																						
		Loser	66	91							All IFF	Winner	303	78	0.77	0.53	-0.4377	0.627	0.1456	0.059	Loser	86	91	All CFF	-----	----	----	----	----	----	-----	-----	-----	-----	----	---							Malaysia	Family 26	Winner	3	2	0.43	0.88	-1.0000	0.640	1.4142	0.021***	Loser	4	14	Family 27	Winner	1	6	0.13	0.60	-0.3780	0.383	0.4082	0.637	Loser	7	9	Family 28	Winner	3	1	0.60	0.94	-0.7071	0.131	1.0000	0.150	Loser	2	17	Family 29	Winner	1	4	0.17	0.76	-0.4472	0.365	0.5000	0.821	Loser	5	13	Family 30	Winner	1	1	0.33	0.95	-0.7071	0.471	1.0000	0.700	Loser	2	19	Family 31	Winner	1	5	0.14	0.69	-0.4082	0.112	0.4472	0.090	Loser	6	11	Family 32	Winner	1	1	0.33	0.95	-0.7071	0.404	1.0000	0.065	Loser	2	19	Family 33	Winner	2	2	0.67	0.90	1.0000	0.841	-0.7071	0.141	Loser	1	18	Family 34	Winner	12	6	0.75	0.14	1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327
	All IFF	Winner	303	78	0.77	0.53	-0.4377	0.627	0.1456	0.059																																																																																																																																																																																																																																																																																																																																						
		Loser	86	91							All CFF	-----	----	----	----	----	----	-----	-----	-----	-----	----	---							Malaysia	Family 26	Winner	3	2	0.43	0.88	-1.0000	0.640	1.4142	0.021***	Loser	4		14	Family 27	Winner	1	6	0.13	0.60	-0.3780	0.383	0.4082	0.637	Loser	7	9	Family 28	Winner	3	1	0.60	0.94	-0.7071	0.131	1.0000	0.150	Loser	2	17	Family 29	Winner	1	4	0.17	0.76	-0.4472	0.365	0.5000	0.821	Loser	5	13	Family 30	Winner	1	1	0.33	0.95	-0.7071	0.471	1.0000	0.700	Loser	2	19	Family 31	Winner	1	5	0.14	0.69	-0.4082	0.112	0.4472	0.090	Loser	6	11	Family 32	Winner	1	1	0.33	0.95	-0.7071	0.404	1.0000	0.065	Loser	2	19	Family 33	Winner	2	2	0.67	0.90	1.0000	0.841	-0.7071	0.141	Loser	1	18	Family 34	Winner	12	6	0.75	0.14	1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137						
	All CFF	-----	----	----	----	----	----	-----	-----	-----																																																																																																																																																																																																																																																																																																																																						
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Malaysia	Family 26	Winner	3	2	0.43	0.88	-1.0000	0.640	1.4142	0.021***																																																																																																																																																																																																																																																																																																																																						
		Loser	4	14							Family 27	Winner	1	6	0.13	0.60	-0.3780	0.383	0.4082	0.637	Loser	7	9	Family 28	Winner	3	1	0.60	0.94		-0.7071	0.131	1.0000	0.150	Loser	2	17	Family 29	Winner	1	4	0.17		0.76	-0.4472	0.365	0.5000	0.821	Loser	5	13	Family 30	Winner	1	1	0.33	0.95	-0.7071	0.471	1.0000	0.700	Loser	2	19	Family 31	Winner	1	5	0.14	0.69	-0.4082	0.112	0.4472	0.090	Loser	6	11	Family 32	Winner	1	1	0.33	0.95	-0.7071	0.404	1.0000	0.065	Loser	2	19	Family 33	Winner	2	2	0.67	0.90	1.0000	0.841	-0.7071	0.141	Loser	1	18	Family 34	Winner	12	6	0.75	0.14	1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																						
	Family 27	Winner	1	6	0.13	0.60	-0.3780	0.383	0.4082	0.637																																																																																																																																																																																																																																																																																																																																						
		Loser	7	9							Family 28	Winner	3	1	0.60	0.94	-0.7071	0.131	1.0000	0.150	Loser	2	17	Family 29	Winner	1	4	0.17	0.76		-0.4472	0.365	0.5000	0.821	Loser	5	13	Family 30	Winner	1	1	0.33		0.95	-0.7071	0.471	1.0000	0.700	Loser	2	19	Family 31	Winner	1	5	0.14	0.69	-0.4082	0.112	0.4472	0.090	Loser	6	11	Family 32	Winner	1	1	0.33	0.95	-0.7071	0.404	1.0000	0.065	Loser	2	19	Family 33	Winner	2	2	0.67	0.90	1.0000	0.841	-0.7071	0.141	Loser	1	18	Family 34	Winner	12	6	0.75	0.14	1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																			
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		Loser	2	17							Family 29	Winner	1	4	0.17	0.76	-0.4472	0.365	0.5000	0.821	Loser	5	13	Family 30	Winner	1	1	0.33	0.95		-0.7071	0.471	1.0000	0.700	Loser	2	19	Family 31	Winner	1	5	0.14		0.69	-0.4082	0.112	0.4472	0.090	Loser	6	11	Family 32	Winner	1	1	0.33	0.95	-0.7071	0.404	1.0000	0.065	Loser	2	19	Family 33	Winner	2	2	0.67	0.90	1.0000	0.841	-0.7071	0.141	Loser	1	18	Family 34	Winner	12	6	0.75	0.14	1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																
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	Family 31	Winner	1	5	0.14	0.69	-0.4082	0.112	0.4472	0.090																																																																																																																																																																																																																																																																																																																																						
		Loser	6	11							Family 32	Winner	1	1	0.33	0.95	-0.7071	0.404	1.0000	0.065	Loser	2	19	Family 33	Winner	2	2	0.67	0.90		1.0000	0.841	-0.7071	0.141	Loser	1	18	Family 34	Winner	12	6	0.75		0.14	1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																							
	Family 32	Winner	1	1	0.33	0.95	-0.7071	0.404	1.0000	0.065																																																																																																																																																																																																																																																																																																																																						
		Loser	2	19							Family 33	Winner	2	2	0.67	0.90	1.0000	0.841	-0.7071	0.141	Loser	1	18	Family 34	Winner	12	6	0.75	0.14		1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38		0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																				
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		Loser	1	18							Family 34	Winner	12	6	0.75	0.14	1.0000	0.730	-0.8165	0.811	Loser	4	1	Family 35	Winner	3	3	0.38	0.80		-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25		0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																	
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		Loser	4	1							Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072	Loser	5	12	Family 36	Winner	2	5	0.25	0.67		-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33		0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																														
	Family 35	Winner	3	3	0.38	0.80	-0.8944	0.190	1.1547	0.072																																																																																																																																																																																																																																																																																																																																						
		Loser	5	12							Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823	Loser	6	10	Family 37	Winner	2	3	0.33	0.82		-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33		0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																											
	Family 36	Winner	2	5	0.25	0.67	-0.4082	0.241	0.4472	0.823																																																																																																																																																																																																																																																																																																																																						
		Loser	6	10							Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453	Loser	4	14	Family 38	Winner	1	1	0.33	0.95		-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60		0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																								
	Family 37	Winner	2	3	0.33	0.82	-0.5000	0.095	0.5774	0.453																																																																																																																																																																																																																																																																																																																																						
		Loser	4	14							Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509	Loser	2	18	Family 39	Winner	3	1	0.60	0.94		-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33		0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																					
	Family 38	Winner	1	1	0.33	0.95	-0.7071	0.432	1.0000	0.509																																																																																																																																																																																																																																																																																																																																						
		Loser	2	18							Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875	Loser	2	17	Family 40	Winner	2	3	0.33	0.82		-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50		0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																		
	Family 39	Winner	3	1	0.60	0.94	-0.7071	0.540	1.0000	0.875																																																																																																																																																																																																																																																																																																																																						
		Loser	2	17							Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094	Loser	4	14	Family 41	Winner	2	1	0.50	0.95		-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50		0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																															
	Family 40	Winner	2	3	0.33	0.82	-0.5000	0.124	0.5774	0.094																																																																																																																																																																																																																																																																																																																																						
		Loser	4	14							Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081	Loser	2	18	Family 42	Winner	2	2	0.50	0.89		0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63		0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																												
	Family 41	Winner	2	1	0.50	0.95	-0.7071	0.169	1.0000	0.081																																																																																																																																																																																																																																																																																																																																						
		Loser	2	18							Family 42	Winner	2	2	0.50	0.89	0.0000	0.609	0.0000	0.438	Loser	2	17	Family 43	Winner	5	2	0.63	0.86		-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25		0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																																									
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		Loser	2	17							Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129	Loser	3	12	Family 44	Winner	1	2	0.25	0.89		-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20		0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																																																						
	Family 43	Winner	5	2	0.63	0.86	-0.5774	0.865	0.7071	0.129																																																																																																																																																																																																																																																																																																																																						
		Loser	3	12							Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158	Loser	3	17	Family 45	Winner	1	3	0.20	0.83		-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41		0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																																																																			
	Family 44	Winner	1	2	0.25	0.89	-0.5774	0.086	0.7071	0.158																																																																																																																																																																																																																																																																																																																																						
		Loser	3	17							Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319	Loser	4	15	All Family	Winner	49	48	0.41	0.85		1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45		0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																																																																																
	Family 45	Winner	1	3	0.20	0.83	-0.5000	0.911	0.5774	0.319																																																																																																																																																																																																																																																																																																																																						
		Loser	4	15							All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921	Loser	70	285	All IFF	Winner	32	33	0.45	0.81		1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35		0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																																																																																													
	All Family	Winner	49	48	0.41	0.85	1.9081	0.004**	-1.0148	0.921																																																																																																																																																																																																																																																																																																																																						
		Loser	70	285							All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921	Loser	39	148	All CFF	Winner	17	21	0.35	0.86		-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																																																																																																											
	All IFF	Winner	32	33	0.45	0.81	1.8935	0.002**	1.1054	0.921																																																																																																																																																																																																																																																																																																																																						
		Loser	39	148							All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095	Loser	31	137																																																																																																																																																																																																																																																																																																																									
	All CFF	Winner	17	21	0.35	0.86	-0.4327	0.548	0.6595	0.095																																																																																																																																																																																																																																																																																																																																						
		Loser	31	137																																																																																																																																																																																																																																																																																																																																												

Table 5.13, continued

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
			W	L						
Indonesia	Family 46	Winner	1	2	0.25	0.89	-0.5774	0.073	0.7071	0.603
		Loser	3	16						
	Family 47	Winner	0	1	0.00	0.95	-1.1547	0.096	2.0000	0.703
		Loser	3	18						
	Family 48	Winner	2	2	0.22	0.78	-1.8898	0.020**	3.5355	0.011**
		Loser	7	7						
	Family 49	Winner	17	4	0.94	0.20	3.0000	0.005**	-1.5000	0.022**
		Loser	1	1						
	Family 50	Winner	17	1	0.89	0.50	-0.7071	0.185	1.0000	0.123
		Loser	2	1						
	Family 51	Winner	18	2	0.95	0.33	1.0000	0.094	-0.7071	0.843
		Loser	1	1						
	Family 52	Winner	1	2	0.14	0.85	-1.6330	0.029**	2.8284	0.023**
		Loser	6	11						
	Family 53	Winner	3	3	0.30	0.70	-1.5119	0.001**	2.3094	0.044**
		Loser	7	7						
	Family 54	Winner	17	2	0.94	0.33	1.0000	0.083	-0.7071	0.127
		Loser	1	1						
	Family 55	Winner	16	2	0.94	0.50	1.0000	0.149	-0.7071	0.093
		Loser	1	2						
Family 56	Winner	3	3	0.33	0.70	-1.2247	0.231	1.7321	0.032**	
	Loser	6	7							
Family 57	Winner	5	3	0.45	0.67	-1.2247	0.451	1.7321	0.021**	
	Loser	6	6							
Family 58	Winner	2	2	0.67	0.89	1.0000	0.549	-0.7071	0.329	
	Loser	1	17							
Family 59	Winner	14	4	0.88	0.50	1.4142	0.073	-1.0000	0.701	
	Loser	2	4							
All Family	Winner	116	33	0.71	0.75	1.1297	0.021**	-1.3173	0.065	
	Loser	47	99							
All IFF	Winner	57	18	0.67	0.77	1.0362	0.521	1.9840	0.025**	
	Loser	28	63							
All CFF	Winner	72	14	0.84	0.68	1.2341	0.090	1.9092	0.043**	
	Loser	13	31							
Pakistan	Family 60	Winner	5	5	0.45	0.58	-0.4082	0.123	0.4472	0.191
		Loser	6	7						
	Family 61	Winner	3	4	0.60	0.78	1.4142	0.821	-1.0000	0.275
		Loser	2	14						
	Family 62	Winner	1	2	0.25	0.89	-0.5774	0.740	0.7071	0.601
		Loser	3	17						
	Family 63	Winner	1	3	0.33	0.85	0.7071	0.190	-0.5774	0.320
		Loser	2	17						
	Family 64	Winner	4	4	0.57	0.75	0.5774	0.171	-0.5000	0.301
		Loser	3	12						
	Family 65	Winner	2	5	0.25	0.67	-0.4082	0.201	0.4472	0.734
		Loser	6	10						
	Family 66	Winner	8	4	0.62	0.60	-0.4472	0.734	0.5000	0.765
		Loser	5	6						

Table 5.13, continued

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
			W	L						
Pakistan	Family 67	Winner	5	5	0.45	0.58	-0.4082	0.501	0.4472	0.092
		Loser	6	7						
	Family 68	Winner	7	5	0.64	0.58	0.5000	0.093	-0.4472	0.540
		Loser	4	7						
	Family 69	Winner	4	2	0.50	0.87	-1.0000	0.430	1.4142	0.127
		Loser	4	13						
	Family 70	Winner	7	7	0.54	0.30	0.4082	0.178	-0.3780	0.437
		Loser	6	3						
	All Family	Winner	47	46	0.50	0.71	0.1466	0.631	-0.1468	0.090
		Loser	47	113						
	All IFF	Winner	25	25	0.48	0.70	0.5327	0.631	0.5465	0.090
		Loser	27	61						
	All CFF	Winner	22	21	0.52	0.71	0.3245	0.104	0.5432	0.071
		Loser	20	52						
Whole Sample	Winner	22	21	0.52	0.71	0.3245	0.104	0.5432	0.071	
	Loser	20	52							
Whole Sample IFF	Winner	561	201	0.71	0.75	1.3122	0.127	1.4455	0.601	
	Loser	230	588							
Whole Sample CFF	Winner	457	144	0.74	0.71	1.0570	0.432	1.1032	0.743	
	Loser	160	363							

Note: IFF is Islamic-focused family and CFF is conventional-family. For the details of the IFF and CFF results by family see Appendix 4.

Longer Period (Yearly)

This sub-section reports the winning and losing persistence of each fund family for the period from January 2007 to December 2018 using a yearly rolling period. Table 5.14 shows that the reported repeat winner z-statistic shows that only 2 out of 32 fund families have a significant positive repeat winner z-statistic, while 7 families out of 34 families are reported with a significant positive repeat loser z-statistic. The reported repeat winner z-statistic shows that only 1 fund family out of 34 fund families have a significant negative repeat winner z-statistic, while none of the families have a significant negative repeat loser z-statistic. This implies that there is no evidence of superior or inferior performance persistence for a one-year rolling period.

The repeat winner ratio of the average for all families shows that 57 percent of all winner families in the first year are winners in the following year. As in the six-month

period, it is insignificant. The repeat loser ratio of the average for all families is reported as 66 percent of all loser families in the first year are losers in the next year. It is also insignificant. The results show that the past six-month and past one-year intervals provide no guide for future investment decisions. This result contradicts Malkiel (1995), Gruber (1996), and Carhart (1997) who found evidence of icy-hand in their analysis.

For the individual country analysis, similar to the results of the whole sample analysis section, no significant persistence for all countries. In Table 5.14. First, for Saudi Arabia, the repeat winner z-statistic shows that two families of 19 families have a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. While there are two families of 15 have a significant positive repeat loser z-statistic, implying the persistence of its inferior performance for twelve-months. Second, for Malaysia, the repeat winner z-statistic shows that two families of 8 families have a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. While, there is one fund family of 19 has a significant positive repeat loser z-statistic, implying the persistence of its inferior performance for twelve-months. Third, for Indonesia, the repeat winner z-statistic shows that one fund family of 8 families has a significant positive repeat winner z-statistic, indicating the persistence of its superior performance. While there are 3 families of 10 have a significant positive repeat loser z-statistic, implying the persistence of its inferior performance for twelve-months. Finally, for Pakistan, just one fund family of 7 has a significant positive repeat loser z-statistic.

Table 5.14: Fund Family Performance Persistence (Yearly)

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value																																																																																																																																																																																																																																																																																																																	
			W	L																																																																																																																																																																																																																																																																																																																							
			Saudi Arabia	Family 1							Winner	4	3	0.67	0.40	0.7071	0.548	-0.5774	0.438																																																																																																																																																																																																																																																																																																								
Loser	2	2		Family 2	Winner	7	1	0.78	0.50	-0.7071	0.166	1.0000	0.543							Loser	2	1	Family 3	Winner	7	2	0.88	0.33	1.0000	0.432	-0.7071	0.712	Loser	1	1	Family 4	Winner	6	2	0.86	0.33	1.0000	0.531	-0.7071	0.127	Loser	1	1	Family 5	Winner	6	2	0.86	0.50	1.0000	0.695	-0.7071	0.091	Loser	1	2	Family 6	Winner	5	3	0.71	0.25	0.7071	0.438	-0.5774	0.078	Loser	2	1	Family 7	Winner	7	2	0.88	0.33	1.0000	0.343	-0.7071	0.069	Loser	1	1	Family 8	Winner	7	2	0.88	0.33	1.0000	0.612	-0.7071	0.084	Loser	1	1	Family 9	Winner	4	2	0.80	0.67	1.0000	0.279	-0.7071	0.156	Loser	1	4	Family 10	Winner	1	3	0.20	0.50	-0.5000	0.168	0.5774	0.610	Loser	4	3	Family 11	Winner	1	1	0.50	0.89	0.0000	0.293	0.0000	0.083	Loser	1	8	Family 12	Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071
Family 2	Winner	7		1	0.78	0.50	-0.7071							0.166	1.0000	0.543																																																																																																																																																																																																																																																																																																											
Loser	2	1		Family 3				Winner	7	2	0.88	0.33	1.0000				0.432	-0.7071	0.712	Loser	1	1	Family 4	Winner	6	2	0.86	0.33	1.0000	0.531	-0.7071	0.127	Loser	1	1	Family 5	Winner	6	2	0.86	0.50	1.0000	0.695	-0.7071	0.091	Loser	1	2	Family 6	Winner	5	3	0.71	0.25	0.7071	0.438	-0.5774	0.078	Loser	2	1	Family 7	Winner	7	2	0.88	0.33	1.0000	0.343	-0.7071	0.069	Loser	1	1	Family 8	Winner	7	2	0.88	0.33	1.0000	0.612	-0.7071	0.084	Loser	1	1	Family 9	Winner	4	2	0.80	0.67	1.0000	0.279	-0.7071	0.156	Loser	1	4	Family 10	Winner	1	3	0.20	0.50	-0.5000	0.168	0.5774	0.610	Loser	4	3	Family 11	Winner	1	1	0.50	0.89	0.0000	0.293	0.0000	0.083	Loser	1	8	Family 12	Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1							
Family 3	Winner	7		2	0.88	0.33	1.0000	0.432	-0.7071	0.712																																																																																																																																																																																																																																																																																																																	
Loser	1	1		Family 4							Winner	6	2	0.86	0.33	1.0000	0.531	-0.7071	0.127	Loser	1	1	Family 5	Winner	6	2	0.86	0.50	1.0000	0.695	-0.7071	0.091	Loser	1	2	Family 6	Winner	5	3	0.71	0.25	0.7071	0.438	-0.5774	0.078	Loser	2	1	Family 7	Winner	7	2	0.88	0.33	1.0000	0.343	-0.7071	0.069	Loser	1	1	Family 8	Winner	7	2	0.88	0.33	1.0000	0.612	-0.7071	0.084	Loser	1	1	Family 9	Winner	4	2	0.80	0.67	1.0000	0.279	-0.7071	0.156	Loser	1	4	Family 10	Winner	1	3	0.20	0.50	-0.5000	0.168	0.5774	0.610	Loser	4	3	Family 11	Winner	1	1	0.50	0.89	0.0000	0.293	0.0000	0.083	Loser	1	8	Family 12	Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																				
Family 4	Winner	6		2	0.86	0.33	1.0000	0.531	-0.7071	0.127																																																																																																																																																																																																																																																																																																																	
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Loser	1	1		Family 8							Winner	7	2	0.88	0.33	1.0000	0.612	-0.7071	0.084	Loser	1	1	Family 9	Winner	4	2	0.80	0.67	1.0000	0.279	-0.7071	0.156	Loser	1	4	Family 10	Winner	1	3	0.20	0.50	-0.5000	0.168	0.5774	0.610	Loser	4	3	Family 11	Winner	1	1	0.50	0.89	0.0000	0.293	0.0000	0.083	Loser	1	8	Family 12	Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																								
Family 8	Winner	7		2	0.88	0.33	1.0000	0.612	-0.7071	0.084																																																																																																																																																																																																																																																																																																																	
Loser	1	1		Family 9							Winner	4	2	0.80	0.67	1.0000	0.279	-0.7071	0.156	Loser	1	4	Family 10	Winner	1	3	0.20	0.50	-0.5000	0.168	0.5774	0.610	Loser	4	3	Family 11	Winner	1	1	0.50	0.89	0.0000	0.293	0.0000	0.083	Loser	1	8	Family 12	Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																					
Family 9	Winner	4		2	0.80	0.67	1.0000	0.279	-0.7071	0.156																																																																																																																																																																																																																																																																																																																	
Loser	1	4		Family 10							Winner	1	3	0.20	0.50	-0.5000	0.168	0.5774	0.610	Loser	4	3	Family 11	Winner	1	1	0.50	0.89	0.0000	0.293	0.0000	0.083	Loser	1	8	Family 12	Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																		
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Loser	4	3		Family 11							Winner	1	1	0.50	0.89	0.0000	0.293	0.0000	0.083	Loser	1	8	Family 12	Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																															
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Loser	1	8		Family 12							Winner	0	1	0.00	0.90	0.0000	0.284	0.0000	0.141	Loser	1	9	Family 13	Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																												
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Loser	1	9		Family 13							Winner	3	1	0.38	0.67	-1.7889	0.031***	4.0000	0.010**	Loser	5	2	Family 14	Winner	4	2	0.57	0.50	-0.5774	0.157	0.7071	0.535	Loser	3	2	Family 15	Winner	1	2	0.33	0.75	0.0000	0.081	0.0000	0.781	Loser	2	6	Family 16	Winner	5	1	0.71	0.75	-0.7071	0.088	1.0000	0.071	Loser	2	3	Family 17	Winner	2	2	0.29	0.50	-1.3416	0.069	2.1213	0.012**	Loser	5	2	Family 18	Winner	3	2	0.50	0.60	-0.5774	0.591	0.7071	0.071	Loser	3	3	Family 19	Winner	3	2	0.43	0.50	-1.0000	0.431	1.4142	0.810	Loser	4	2	Family 20	Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																																									
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Loser	4	2	Family 20							Winner	7	2	0.88	0.33	1.0000	0.501	-0.7071	0.202	Loser	1	1	Family 21	Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																																																																																																																																					
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Loser	1	1	Family 21							Winner	4	3	0.80	0.25	2.0000	0.001**	-1.1547	0.543	Loser	1	1	Family 22	Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																																																																																																																																																		
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Loser	1	1	Family 22							Winner	5	2	0.83	0.60	1.0000	0.701	-0.7071	0.712	Loser	1	3	Family 23	Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																																																																																																																																																															
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Loser	1	3	Family 23							Winner	7	2	0.88	0.33	1.0000	0.092	-0.7071	0.579	Loser	1	1	Family 24	Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																																																																																																																																																																												
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Loser	1	1	Family 24							Winner	6	2	0.86	0.50	1.0000	0.067	-0.7071	0.068	Loser	1	2	Family 25	Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																																																																																																																																																																																									
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Loser	1	2	Family 25							Winner	5	3	0.71	0.25	0.7071	0.229	-0.5774	0.091	Loser	2	1																																																																																																																																																																																																																																																																																																						
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Table 5.14, continued

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
			W	L						
Saudi Arabia	All Family	Winner	110	50	0.69	0.55	-0.1419	0.427	0.1414	0.059
		Loser	49	62						
	All IFF	Winner	105	52	0.68	0.54	-0.1215	0.442	0.1612	0.075
		Loser	48	63						
	All CFF	-----	----	----	----	----	----	-----	-----	-----
		-----	----	---						
Malaysia	Family 26	Winner	1	3	0.33	0.67	0.7071	0.690	-0.5774	0.801
		Loser	2	6						
	Family 27	Winner	1	3	0.20	0.50	-0.5000	0.363	0.5774	0.607
		Loser	4	3						
	Family 28	Winner	2	2	0.40	0.67	-0.5774	0.131	0.7071	0.120
		Loser	3	4						
	Family 29	Winner	1	2	0.25	0.71	-0.5774	0.165	0.7071	0.801
		Loser	3	5						
	Family 30	Winner	1	2	0.25	0.71	-0.5774	0.171	0.7071	0.700
		Loser	3	5						
	Family 31	Winner	2	3	0.67	0.63	2.0000	0.012**	-1.1547	0.090
		Loser	1	5						
	Family 32	Winner	4	2	0.80	0.67	1.0000	0.004	-0.7071	0.065
		Loser	1	4						
	Family 33	Winner	3	2	0.75	0.71	1.0000	0.801	-0.7071	0.141
		Loser	1	5						
	Family 34	Winner	7	2	0.88	0.33	1.0000	0.700	-0.7071	0.812
		Loser	1	1						
	Family 35	Winner	0	1	0.00	0.89	-0.7071	0.090	1.0000	0.071
		Loser	2	8						
	Family 36	Winner	1	2	0.25	0.71	-0.5774	0.141	0.7071	0.810
		Loser	3	5						
	Family 37	Winner	1	1	0.33	0.88	-0.7071	0.123	1.0000	0.123
		Loser	2	7						
	Family 38	Winner	1	2	0.50	0.78	1.0000	0.821	-0.7071	0.821
		Loser	1	7						
	Family 39	Winner	1	2	0.25	0.71	-0.5774	0.740	0.7071	0.740
		Loser	3	5						
	Family 40	Winner	2	1	0.50	0.86	-0.7071	0.190	1.0000	0.190
		Loser	2	6						
	Family 41	Winner	1	2	0.50	0.78	1.0000	0.171	-0.7071	0.271
		Loser	1	7						
	Family 42	Winner	1	1	0.33	0.88	-0.7071	0.201	1.0000	0.301
		Loser	2	7						
	Family 43	Winner	2	1	0.50	0.86	-0.7071	0.734	1.0000	0.634
		Loser	2	6						
	Family 44	Winner	3	6	0.33	0.88	-0.7071	0.093	1.0000	0.193
		Loser	1	1						
	Family 45	Winner	2	7	0.20	0.83	-0.5000	0.911	0.5774	0.319
		Loser	3	6						
All Family	Winner	34	36	0.44	0.75	0.9583	0.211	-0.9765	0.921	
	Loser	42	109							
All IFF	Winner	24	21	0.53	0.71	0.9732	0.502	0.8032	0.341	
	Loser	21	53							
All CFF	Winner	17	21	0.35	0.86	-0.4376	0.648	0.8732	0.106	
	Loser	31	18							

Table 5.14, continued

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
			W	L						
Indonesia	Family 46	Winner	3	2	0.75	0.71	1.0000	0.071	-0.7071	0.601
		Loser	1	5						
	Family 47	Winner	2	2	0.67	0.75	1.0000	0.086	-0.7071	0.700
		Loser	1	6						
	Family 48	Winner	1	3	0.33	0.63	0.7071	0.210	-0.5774	0.190
		Loser	2	5						
	Family 49	Winner	6	1	0.75	0.67	-0.7071	0.705	1.0000	0.781
		Loser	2	2						
	Family 50	Winner	3	4	0.50	0.20	0.5774	0.184	-0.5000	0.120
		Loser	3	1						
	Family 51	Winner	2	1	0.29	0.75	-1.7889	0.002**	4.0000	0.001**
		Loser	5	3						
	Family 52	Winner	1	1	0.33	0.88	-0.7071	0.0691	1.0000	0.700
		Loser	2	7						
	Family 53	Winner	2	1	0.40	0.83	-1.1547	0.701	2.0000	0.010**
		Loser	3	5						
	Family 54	Winner	5	3	0.71	0.25	0.7071	0.432	-0.5774	0.432
		Loser	2	1						
	Family 55	Winner	4	1	0.57	0.75	-1.1547	0.531	2.0000	0.031**
		Loser	3	3						
Family 56	Winner	0	3	0.00	0.57	-0.5000	0.695	0.5774	0.695	
	Loser	4	4							
Family 57	Winner	2	3	0.33	0.40	-0.5000	0.438	0.5774	0.438	
	Loser	4	2							
Family 58	Winner	1	2	0.50	0.78	1.0000	0.343	-0.7071	0.343	
	Loser	1	7							
Family 59	Winner	5	2	0.63	0.33	-0.5774	0.612	0.7071	0.612	
	Loser	3	1							
All Family	Winner	37	29	0.48	0.64	1.1948	0.031**	-1.2436	0.065	
	Loser	36	52							
All IFF	Winner	20	16	0.54	0.68	0.6651	0.661	0.7501	0.475	
	Loser	17	35							
All CFF	Winner	30	15	0.75	0.53	1.0348	0.110	0.9643	0.113	
	Loser	10	17							
Pakistan	Family 60	Winner	3	4	0.50	0.20	0.5774	0.120	-0.5000	0.091
		Loser	3	1						
	Family 61	Winner	1	1	0.25	0.86	-1.1547	0.801	2.0000	0.035***
		Loser	3	6						
	Family 62	Winner	1	1	0.33	0.88	-0.7071	0.700	1.0000	0.501
		Loser	2	7						
	Family 63	Winner	1	3	0.33	0.63	0.7071	0.090	-0.5774	0.120
		Loser	2	5						
	Family 64	Winner	1	2	0.25	0.71	-0.5774	0.071	0.7071	0.801
		Loser	3	5						
	Family 65	Winner	1	1	0.33	0.88	-0.7071	0.301	1.0000	0.700
		Loser	2	7						
	Family 66	Winner	5	2	0.83	0.60	1.0000	0.063	-0.7071	0.076
		Loser	1	3						

Table 5.14, continued

	Family	Previous Month	Following Month		Repeat Winner	Repeat Loser	Repeat Winner Z-stat	P-Value	Repeat Loser Z-stat	P-Value
			W	L						
Pakistan	Family 67	Winner	1	4	0.25	0.43	0.5774	0.743	-0.5000	0.190
		Loser	3	3						
	Family 68	Winner	1	4	0.25	0.43	0.5774	0.837	-0.5000	0.216
		Loser	3	3						
	Family 69	Winner	2	2	0.67	0.75	1.0000	0.092	-0.7071	0.612
		Loser	1	6						
	Family 70	Winner	4	3	0.50	0.00	-0.5000	0.071	0.5774	0.327
		Loser	4	0						
	All Family	Winner	22	26	0.44	0.63	0.3898	0.631	-0.1924	0.090
		Loser	27	46						
	All IFF	Winner	12	15	0.42	0.60	0.7438	0.681	0.6501	0.190
		Loser	16	23						
	All CFF	Winner	13	18	0.52	0.71	0.5630	0.164	0.5198	0.341
		Loser	14	14						
Whole Sample	Winner	202	142	0.57	0.66	-0.9670	0.084	1.0070	0.712	
	Loser	154	270							
Whole Sample IFF	Winner	166	102	0.61	0.62	0.8485	0.075	0.7940	0.084	
	Loser	103	173							
Whole Sample CFF	Winner	60	54	0.52	0.47	0.7652	0.540	0.6932	0.439	
	Loser	55	49							

Note: IFF is Islamic-focused family and CFF is conventional-family. For the details of the IFF and CFF results by family see Appendix 4.

Islamic Focused Family Vs Conventional Focused Family

This section discusses the differences between the performance persistence of Islamic focused family (IFF) and conventional focused family (CFF). As Saudi Arabia includes no resident conventional focused family as defined, the results discuss for the other three countries in the sample. The periods include one month, six months and one-year period.

One-Month

This sub-section shows the contingency table of IFF during the period from January 2007 to December 2018 using a month-by-month rolling period. Table 5.12 shows for the whole sample analysis, the repeat winner/loser ratio is 0.72/0.74. The results show positive persistence in the IFF 2.0137. However IFF does not show

negative persistence 1.1032. That means the IFF shows a hot-hand phenomenon in the short-time up to one-month. The positive sign of the repeat winner z-statistic exhibits that 21 IFF are winners in the month immediately after a winning month, but of which 11 fund family is statistically significant. While 29 IFF show negative signs of the repeat winner z-statistic, but of which only one fund family is statistically significant. In addition, the positive sign of repeat loser z-statistic exhibits in 25 IFF, but of which only two families are statistically significant. While none of the families with a negative sign of repeat loser z-statistic are statistically significant. For Individual country analysis, the repeat winner/loser ratio is (Malaysia 0.39/0.77, Indonesia 0.38/0.73, and Pakistan 0.47/0.72). Results find positive persistence in Malaysia and Indonesia 1.9743, 1.9935 respectively, while it's was insignificant in Pakistan -0.3461. In Malaysia and Indonesia there is 3 IFF are statistically significant for each country and in Pakistan only one fund family. However, the results indicate there is no evidence of cold-hand phenomenon in countries under-study.

Table 5.12 also shows the contingency table of CFF. For the whole sample, the repeat winner/loser ratio is 0.57/0.71. The results show negative persistence in the CFF 1.9326. However CFF does not show positive persistence 1.0134. That means CFF show cold-hand phenomenon in the short-time up to one-month. The positive sign of repeat loser z-statistic exhibits in 18 CFF, but of which 6 families are statistically significant. While only 2 families with a negative sign of repeat loser z-statistic are statistically significant. In addition, the positive sign of the repeat winner z-statistic exhibits that 12 CFF are winners in the month immediately after a winning month, but of which only 3 fund family is statistically significant. While none of the negative sign CFF of the repeat winner z-statistic is statistically significant.

For Individual country analysis, the repeat winner/loser ratio is (Malaysia 0.41/0.74, Indonesia 0.76/0.61, and Pakistan 0.45/0.72). The results find positive persistence in Malaysia only 1.9931, while find negative persistence in Malaysia, Indonesia, and Pakistan 1.9915, 1.9521, and 1.9326 respectively. In Malaysia, there are two CFF that are statistically positive significant, and 3 CFF statistically negative significant. In Indonesia, there are one CFF is statistically positive significant, and 3 families statistically negative significant. In Pakistan, there are two families that are statistically negative significant only.

Six-Month

In this sub-section, the results of IFF and CFF persistence for a longer, return rolling period of six months. Table 5.13 shows the contingency table of IFF during the period from January 2007 to December 2018 using a semi-annual rolling period. For the whole sample analysis, the repeat winner/loser ratio is 0.74/0.71. The results show that the IFF did not appear both positive and negative persistence; both are insignificant 1.0570 and 1.1032 respectively. This means at the six-month period IFF did not appear hot-hand and cold-hand persistence. Only 8 IFF are statically significant. For Individual country analysis, the repeat winner/loser ratio is (Malaysia 0.45/0.81, Indonesia 0.67/0.77, and Pakistan 0.48/0.70). The results find positive persistence in Malaysia only 1.8935, there is 3 IFF in Malaysia are statistically significant. However, find a negative persistence in Indonesia only 1.9840, there is 3 IFF in Indonesia are statistically significant. The results conclude that there is evidence of hot-hand persistence in Malaysia, and evidence of cold-hand persistence in Indonesia. While there is no evidence of persistence in Pakistan IFF in the six-month period.

Table 5.13 also shows the contingency table of CFF. For the whole sample, the repeat winner/loser ratio is 0.63/0.79. The results show that CFF did not appear both positive and negative persistence; both are insignificant 0.7542 and 0.9325 respectively. This means at the six-month period CFF did not appear hot-hand and cold-hand persistence. Only 3 CFF are statically significant. For Individual country analysis, the repeat winner/loser ratio is (Malaysia 0.35/0.86, Indonesia 0.84/0.68, and Pakistan 0.52/0.71). The results show negative persistence in the CFF of Indonesia only 1.9092, which means CFF in Indonesia only shows cold-hand phenomenon at the six-month period. While in Malaysia and Pakistan was insignificant 0.6595 and 0.5432 respectively. However CFF does not show positive persistence in all countries (Malaysia -0.4327, Indonesia 1.2341, and Pakistan 0.3245). The results conclude that there is evidence of cold-hand persistence in Indonesia only. While there is no evidence of persistence in Malaysia and Pakistan CFF in the six-month period.

One-Year

Next, the analysis compare IFF and CFF persistence for a longer, return rolling period of twelve months. Table 5.14 shows the contingency table of IFF during the period from January 2007 to December 2018 using a yearly rolling period. For the whole sample analysis, the repeat winner/loser ratio is 0.61/0.62. The results show that the IFF did not appear both positive and negative persistence; both are insignificant 0.8485 and 0.7940 respectively. This means at the twelve-month period IFF did not appear hot-hand and cold-hand persistence. Only one IFF is statically significant. For Individual country analysis, the repeat winner/loser ratio is (Saudi 0.68/0.554, Malaysia 0.53/0.71, Indonesia 0.54/0.68, and Pakistan 0.42/0.60). The results did not find any evidence of both positive and negative persistence at a twelve-month period, it was

insignificant for all country whether positive or negative persistence (Saudi - 0.1215/0.1612, Malaysia 0.9732/0.8032, Indonesia 0.6651/0.7501, and Pakistan 0.7438/0.6501). Only one IFF in Saudi Arabia is statistically significant. The results conclude that there is no evidence of hot-hand persistence and cold-hand persistence in IFF at a twelve-month period. Table 5.14 also shows the contingency table of CFF. The results are similar to the results of the IFF. The results did not find any evidence of positive and negative persistence at the twelve-month period, whether for both the whole sample analysis and individual country analysis. This means that there is no evidence of hot-hand persistence and cold-hand persistence in the CFF in the twelve-month period.

In summary, IFF have persistence in all fund family analysis, and in Malaysia and Indonesia for individual country analysis. At six month analysis, there are evidence of positive persistence in IFF on Malaysia only, and negative persistence in IFF on Indonesia only.

5.2.6 Summary and Discussion

This empirical part of the thesis presents new evidence on the performance of mutual fund families, especially compared to the performance of the Islamic focused family (IFF) and conventional focused family (CFF) in three sub-parts. First, calculate different performance measures, including traditional measures like Sharpe and Treynor ratios, in addition to multifactor models like the Carhart four-factor model, to examine the returns and risk characteristics of mutual fund family and to show any differences between IFF and CFF performance. Second, investigate the impact of star and poor funds on the fund family performance, and whether this impact differs between the performance of IFF and CFF. Third, provide new evidence about the performance

persistence at the fund family level, and whether this persistence differs between the performance of IFF and CFF including one, six, and twelve months.

The overall results conclude that the fund family outperforms the market benchmarks, and has good selectivity skills. This is due to the advantages provided by fund families like diversification and liquidity. This means the results accept hypothesis one (selectivity part). This is consistent with the modern portfolio theory, which indicates that good diversification when forming investment portfolios reduces risk and improves performance. For the timing ability of fund family managers, both IFF and CFF managers are poor in terms of market timing. This means the results reject hypothesis one (timing part). This is consistent with the previous literature at the fund level for example, (Abdullah et al. 2007, Lestari 2015, and Hilman 2017). In addition, the results indicate that Saudi Arabia has better performance compared to the other countries, followed by Malaysia, then Indonesia, and then Pakistan. This may be due to the own nature of investments in Saudi Arabia. Saudi Arabia is characterized as highly family-oriented occupying businesses, this provides new and diversified funding sources for funds family.

For the comparative analysis between the IFF and the CFF, the results show that there are differences between the performance of IFF and CFF, which means the results accept hypothesis two. In the all fund family samples analysis, the results indicate that the IFF outperforms CFF. For the individual country analysis, in Malaysia and Pakistan, IFF outperforms CFF, while, in Indonesia, CFF outperforms IFF. This ensures that *Sharia* screening will not impose major costs on investors in the Islamic investment. This is inconsistent with the previous literature at the fund level, for example, Ashraf (2013), Boo et al. (2016), Al Rahahleh & Bhatti (2017), while, for Indonesia, the results

are consistent with the previous literature, for example, Waridah & Mediawati (2016), Agussalim et al. (2017).

In terms of star and poor funds and impact on the fund family performance, the overall results for all the countries show that all variables included control in the analysis are significant with the dependent variable (Carhart four-factor risk-adjusted return). Fund family age, number of funds, dummy star, and past one-month fund family return have a positive relationship with the fund family returns. This is inconsistent with the previous literature at the fund level, for example, Ahmad et al. (2017); Fikri & Yahya (2019) for the age variable, while total risk and dummy poor have a negative relationship with the fund family return performance. This is inconsistent with the previous literature at the fund level, for example, Low (2010), Nazir & Nawaz (2010). For dummy star the results consistent with previous study, for example, Hunter et al. (2020). In summary, results concluded that the impact of fund family attributes on fund family performance is different between IFF and CFF. This means that some attributes have an impact on both IFF and CFF. For example, dummy star and past returns. At the same time, other attributes impact on one type of fund family, for example, dummy poor and fund family age. The overall results indicate that the IFF was less affected by fund family attributes than the CFF.

In terms of fund family performance persistence, the results concluded that the superior performance of fund families persists for up to one month, and that the hot-hands effect is found to exist. The results also found evidence of icy-hand families up to the one-month period. In other words, the short-term past superior performance of fund families provides useful information for future fund family performance. The track record of superior fund families can be used by the investors for investment decision-making for up to one month. The evidence is in line with the studies conducted in the

US on mutual funds' performance persistence by Hendrick et al. (1993), Goetzmann & Ibbotson (1994), and Elton et al. (1996) who found evidence of short-term funds performance persistence of one-month to three-months. However, in Hong Kong, Cheng et al. (1999) found no evidence of performance persistence in fund houses. Similarly, the results of this thesis found no evidence of long-term performance persistence in six-months or longer in both the superior or inferior fund families in our sample. In addition, McCourt & Ramos (2019), at the fund family level, concluded that the top-decile fund family performance persistence is comparable to that of individual funds, thereby indicating that families do not tend to create conditions for maintaining outperformance. The results also concluded that the performance persistence was differs between IFF and CFF. At one month analysis, the results find positive persistence on IFF, while find negative persistence on CFF. At six month analysis IFF in Malaysia have positive persistence, while find no evidence of persistence on CFF of all country. However, the results of one year analysis similar to the all fund family analysis.

Much of the theoretical discussion on performance persistence was conducted with reference to the efficient market hypothesis. The efficient market hypothesis suggests consistently making superior returns is not possible. The theoretical implication of the effects of persistent better performance seen in fund family one-month data is that the efficient market hypothesis in this market may be in its weak form and that the market is less effective in knowledge. Such finding does not invalidate the efficient market theory, because success consistency evidence is found for up to one month. Many investors are not well-informed, so there is relatively weaker competition among informed investors trying to compete with the surplus created by truly skilled fund managers. Consequently, the success of the superior fund family continues to the next month. Moreover, this superior trend of persistence may also be because the

majority of investors are unsophisticated investors. Sirri & Tufano (1997), and Karceski & James (2002) clarified that unsophisticated market investors could prove persistent success. Another potential explanation for this evidence of persistence of better performance could be market momentum. Momentum is the empirically perceived propensity to further raise the asset prices. Then, the asset is more likely to underperform, and often significantly underperform, after the duration of over performance. For the summary of hypotheses and results see appendix 6.

5.3 Fund Family Flows

This section provides the results for the analysis of fund family flows. It reports the findings related to the research question two, which, in turn, addresses three main related hypotheses and one co-hypothesis to the issues of fund family flows. This section is divided into two empirical parts. The first empirical part deals with the effect of fund family attributes on overall fund family new-money growth. This part is focus on the effect of star (poor) fund family on the new money growth of fund family. In addition, the effect of other fund family attributes as control variables on the new money growth of the fund family. Control variables are fund family age, size, number of funds within the fund family, past fund family performance, and fund family total risk.

The second empirical part concerns the spillover effects. This part is also divided into two sub-sections, first, the spillover effect of Islamic star funds, and, second, the spillover effect of conventional star funds on flows of other funds in the fund family. Fund family performance is calculated by the weighted average of Carhart's' four-factor model for all the funds in the fund family. Fund family new money growth is calculated according to TNA. The analysis runs on two parts of the sample, the analysis of the overall fund family sample, and analysis of the individual countries sample. Section

5.3.1 presents the descriptive statistics. Section 5.3.2 presents the Star (Poor) funds and fund family new-money growth. Section 5.3.3 presents the spillover effects, and Section 5.3.4 presents the summary and discussion.

5.3.1 Descriptive Statistics

This sub-section shows the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. The results show H_0 : constant variance, which means there is no heteroscedasticity, and $\text{prob} > \chi^2$ is 0.092; more than 0.05 suggests that the null hypothesis cannot be rejected. Given the potential problems of multicollinearity among the fund family attributes variables, a diagnostic check was performed using variance inflation factors (VIFs). As a rule of thumb, a $VIF > 10$ is taken as an indicator of the presence of multicollinearity. The diagnostic results show that none of the fund family characteristics variables have a value greater than 10, which suggests that there is no multicollinearity.

Table 5.15: Breusch-Pagan/ Cook-Weisberg and VIF Test

Variables	VIF	1/ VIF	Heteroscedasticity test
Fund Family Age	1.40	0.7134	
Number of Funds	1.30	0.7717	
Fund Family Size	1.14	0.8770	
Past Flows	1.13	0.8866	
Dummy Star	-----	-----	H_0 : Constant variance
Dummy Poor	-----	-----	$\text{Prob} > \chi^2 = 0.092$
Past Performance	1.04	0.9593	
Total Risk	1.07	0.8954	
Mean VIF	1.18	-----	

Table 5.16 descriptive statistics of the star (poor) of funds and families in addition to the new money growth of the fund family. Table 5.16 reports that the mean of new money growth of all country sample is positive and equal 0.319, and the standard deviation is equal to 0.083, which means that the fund families received an overall

positive net inflow during the sample period. For the individual countries, the fund families in Saudi Arabia and Malaysia report positive new money growth 0.236 and 0.763, respectively, while the fund family new money growth in Indonesia and Pakistan are negative -0.037 and -0.315, respectively. This means that the fund families received an overall negative net inflow during the sample period in these two countries.

Table 5.16: Descriptive Statistics

		Fund Family		IFF		CFF		Equality of variance		Equality of means	
		N	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	T.S	P. Value	T.S	P. Value
Malaysia	No. of funds	170	165.5 (3.304)	75	71.7 (8.562)	95	88.6 (1.258)	1.426	0.084	4.591	0.000
	No. of family	20	17.9 (1.552)	8	7.71 (1.132)	12	11.5 (1.865)	1.453	0.080	2.933	0.000
	No. star funds	9	8.08 (0.791)	4	3.72 (0.815)	5	4.91 (0.773)	1.053	0.072	1.165	0.000
	No. poor funds	9	8.33 (0.780)	4	3.88 (0.793)	5	4.65 (0.832)	0.932	0.032	1.351	0.000
	No. ISF	5	4.75 (0.755)	3	2.54 (0.751)	2	1.57 (0.341)	0.327	0.002	0.319	0.001
	No. IPF	1	0.83 (0.838)	0	0 (0)	1	0.64 (0.241)	–	–	–	–
	No. CSF	4	3.33 (0.657)	1	0.82 (0.806)	3	2.54 (0.874)	0.431	0.000	0.327	0.000
	No. CPF	8	6.50 (0.525)	4	3.89 (0.812)	5	4.96 (1.657)	1.854	0.002	1.615	0.001
	N.M.G	20	0.763 (1.235)	8	0.762 (1.032)	12	0.381 (0.875)	0.895	0.001	0.654	0.002
	Indonesia	No. of funds	83	79.3 (2.718)	34	30.6 (6.006)	49	47.5 (3.175)	5.339	0.000	5.668
No. of family		14	13.3 (1.374)	5	4.78 (1.179)	9	8.51 (1.118)	4.424	0.000	4.282	0.000
No. star funds		4	3.75 (0.626)	2	1.83 (0.891)	2	2.69 (0.375)	0.761	0.002	0.712	0.000
No. poor funds		4	3.92 (0.674)	2	1.86 (0.854)	2	2.87 (0.651)	0.435	0.001	0.381	0.002
No. ISF		3	2.72 (1.000)	2	1.81 (0.788)	1	0.78 (0.459)	0.710	0.012	0.663	0.000
No. IPF		2	1.88 (0.291)	1	0.94 (0.564)	1	1.67 (0.284)	0.501	0.000	0.511	0.001
No. CSF		1	0.33 (0.783)	0	0 (0)	1	3.53 (0.251)	–	–	–	–
No. CPF		2	1.83 (0.587)	1	0.87 (0.651)	1	0.91 (0.316)	0.346	0.002	0.271	0.001
N.M.G		14	-0.037 (1.438)	8	0.107 (1.402)	6	-0.140 (1.383)	2.280	0.012	3.434	0.000

Table 5.16, continued

	Fund Family		IFF		CFF		Equality of variance		Equality of means	
	N	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	T.S	P. Value	T.S	P. Value
Pakistan	No. of funds	87 82.8 (2.420)	33	28.5 (2.958)	54	52.8 (3.467)	-0.182	0.429	-0.561	0.293
	No. of family	11 10.81 (1.143)	3	2.62 (1.187)	8	7.31 (1.312)	2.343	0.014	3.745	0.000
	No. star funds	5 4.92 (0.674)	2	1.54 (0.864)	3	2.76 (0.765)	0.297	0.051	0.326	0.001
	No. poor funds	5 5.00 (0.600)	2	1.15 (0.791)	3	2.83 (0.743)	0.381	0.062	0.410	0.001
	No. ISF	3 2.67 (0.654)	2	1.93 (0.732)	0	0 (0)	-	-	-	-
	No. IPF	2 1.67 (0.657)	0	0 (0)	3	2.54 (0.811)	-	-	-	-
	No. CSF	2 1.75 (0.451)	0	0 (0)	3	2.81 (0.674)	-	-	-	-
	No. CPF	3 2.25 (0.455)	2	1.54 (0.410)	0	0 (0)	-	-	-	-
	N.M.G	11 -0.315 (0.755)	6	-0.240 (0.720)	5	-0.381 (0.833)	1.661	0.049	2.886	0.002
	Saudi Arabia	No. of funds	162 156.7 (3.590)	162	156.7 (3.590)	--	--	--	--	--
No. of family		25 24.8 (1.785)	25	24.8 (1.785)	--	--	--	--	--	--
No. star funds		8 7.9 (1.164)	8	7.9 (1.164)	--	--	--	--	--	--
No. poor funds		8 7.16 (0.833)	8	7.16 (0.833)	--	--	--	--	--	--
No. ISF		8 7.92 (1.161)	8	7.92 (1.161)	--	--	--	--	--	--
No. IPF		5 4.83 (0.582)	5	4.83 (0.582)	--	--	--	--	--	--
No. CSF		0 0 (0)	0	0 (0)	--	--	--	--	--	--
No. CPF		3 1.63 (0.787)	3	1.63 (0.787)	--	--	--	--	--	--
N.M.G		25 0.236 (1.753)	25	0.236 (1.753)	--	--	--	--	--	--

Table 5.16, continued

		Fund Family		IFF		CFF		Equality of variance		Equality of means	
		N	Mean (S.D)	N	Mean (S.D)	N	Mean (S.D)	T.S	P. Value	T.S	P. Value
All	No. of funds	502	494.3 (7.819)	304	301.4 (9.168)	198	191.2 (8.147)	7.868	0.000	9.970	0.000
	No. of family	70	65.8 (5.742)	41	40.6 (4.481)	29	28.2 (3.955)	5.215	0.000	8.577	0.000
	No. star funds	25	34.67 (1.781)	15	14.20 (3.432)	10	9.5 (2.139)	3.163	0.051	3.021	0.001
	No. poor funds	25	24.42 (1.622)	15	14.65 (2.658)	10	9.61 (2.617)	3.256	0.065	2.932	0.005
	No. ISF	18	17.75 (1.665)	13	11.61 (3.065)	3	1.54 (0.871)	0.710	0.022	0.651	0.000
	No. IPF	6	5.42 (1.311)	7	5.43 (1.043)	3	2.42 (1.183)	0.832	0.042	0.784	0.000
	No. CSF	7	6.72 (1.000)	2	1.88 (0.541)	7	6.65 (1.951)	0.779	0.011	0.694	0.002
	No. CPF	16	14.72 (1.248)	8	7.54 (1.652)	7	5.12 (1.043)	0.526	0.003	0.496	0.000
	N.M.G	70	0.319 (0.083)	50	0.216 (1.472)	20	0.066 (1.417)	5.028	0.000	5.597	0.000

Note: ISF and IPF is the Islamic star and poor fund. CSF and CPF is the conventional star and poor fund. N.M.G is the new money growth. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Number of star funds is 25 funds (5%*502), 15 funds (5%*297) in the Islamic focused family and 10 funds (5%*205) in the conventional focused family. Similar, the number of poor funds is 25 funds, 15 funds in the Islamic focused family, and 10 funds the conventional focused family.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

This sub-section also reports the new money growth of IFF and CFF for each country under study, and for the all countries sample. For all fund families in the four countries, both IFF and CFF show positive new money growth as a total 0.216 and 0.066, respectively. This means that both types of fund family received an overall positive net inflow during the sample period. However, the IFF received more net money flow than the CFF because Malaysia and Saudi Arabia lead the data of sample,

and both countries have a large number of IFF and IMFs. For the individual countries, in Malaysia, both IFF and CFF report positive new money growth 0.762 and 0.381, respectively, which means that both types of fund family received positive net inflow, in addition, IFF received more money flow than CFF. In Pakistan both the IFF and CFF report negative new money growth -0.240 and -0.381, respectively, which means that both types of fund family received negative net inflow. For Indonesia, the IFF reports positive new money growth 0.107, and the CFF reports negative new money growth -0.140.

Correlation

This sub-section presents the pairwise correlations for fund family new money growth and independent variables; also, below the correlation coefficients are the p-values for the tests of significance of the coefficients. To check if the problem of multicollinearity exists. Table 5.17 shows that the fund family new money growth is correlated positively with fund family age, a number of funds in the fund family, past fund family returns, and Dummy star. This means that the oldest fund families attract more money flows than younger families. In addition, according to the number of funds in the fund family, the larger fund families attract more money flows than the smallest. Finally, fund families with star funds attract more money flows. However, the fund family new money is correlated negatively with fund family size, total risk, and Dummy poor. This suggests that large fund families according to the TNA attract less money flows than the small size, and fund families with more total risk attract less money flows than those with less total risk. In addition, fund families with poor funds have more money outflows. Finally, the correlation between the other fund family attributes is relatively low and unlikely to lead to a multicollinearity problem.

Table 5.17: Correlation Matrix

Variable	N.M.G	Family Age	Number of Funds	Family Size	Dummy Star	Dummy Poor	Past Return	Total risk
N.M.G	1.000	---	0.117* (0.010)	-0.042* (0.021)	0.534* (0.001)	-0.021 (0.414)	0.221* (0.021)	-0.021 (0.117)
Family Age	0.199** (0.000)	1.000	0.047* (0.001)	-0.101* (0.000)	0.052 (0.061)	0.025* (0.010)	-0.244* (0.012)	-0.217* (0.002)
Number of Funds	0.217* (0.000)	0.187* (0.000)	1.000	0.145* (0.030)	0.220* (0.003)	0.112* (0.000)	-0.243* (0.020)	-0.171* (0.010)
Family Size	-0.080* (0.041)	-0.203* (0.000)	0.345* (0.000)	1.000	-0.028 (0.134)	-0.118 (0.571)	0.024** (0.041)	-0.021 (0.729)
Dummy Star	0.714* (0.000)	0.060 (0.082)	0.190* (0.000)	-0.056 (0.107)	1.000	-0.021 (0.382)	0.032* (0.002)	-0.023 (0.884)
Dummy Poor	-0.043 (0.204)	0.075* (0.030)	0.192* (0.000)	-0.038 (0.273)	-0.010 (0.782)	1.000	-0.120* (0.001)	0.211 (0.254)
Past Returns	0.152* (0.000)	-0.124* (0.003)	-0.141* (0.000)	0.073** (0.034)	0.029* (0.000)	-0.150* (0.00)	1.000	0.317* (0.003)
Total Risk	-0.032 (0.237)	-0.117* (0.006)	-0.150* (0.000)	-0.019 (0.569)	-0.003 (0.914)	0.011 (0.744)	-0.227* (0.000)	1.000

Note: P-Value in brackets. Spearman rank above the diagonal; Pearson product-moment below diagonal. Asterisks denote significance at the * – .10, ** – .05 and *** – .01 level. N.M.G is the new money growth.

5.3.2 Star (Poor) Funds and Fund Family New-Money Growth

Apart from diversification, the primary reason for investing in the fund family is profit-seeking. Families are believed to seek and raise star funds since star funds draw investment and increase the overall flow of capital into the fund family (Nanda et al. 2004; Adrianto et al. 2019). Having star funds is one of the fund family attributes that can affect the fund family new-money growth. This section examines the behaviour of fund families' investors in respect of the fund family attributes. The results are divided into two sub-sections, first, the effect of star (poor) fund family on the fund family new money growth. Second, the effect of other control variables on fund family new money growth, like fund family age, fund family size, number of funds in the fund family, total risk, and past fund family returns. In this section, the regressions are run using fund family data, to examine whether the fund family attributes have an impact on fund family new money growth. These models are applied in the two analyses. First, all

overall fund family sample includes individual country sample. Second, Islamic focused family and conventional focused family.

Star (Poor) Fund Family and Overall Fund Family New Money Growth

Overall Fund Family and by Country

This sub-section seeks to test the star identity of fund families to test hypothesis four, which indicates that having at least one star (poor) fund in the fund family has a positive (negative) relationship on the new money growth of the fund family. Where ‘new money growth to the fund family’ is the dependent variable and ‘star (poor) fund family dummy’ is the principal explanatory variable. This sub-section focus on the effect of having a star (poor) fund on the fund family flows for the all fund family sample includes individual countries and Islamic and conventional focused family. The sample is 25 fund family for Saudi Arabia, 20 for Malaysia, 14 for Indonesia, and 11 for Pakistan.

The coefficients of the variable past fund family returns are positive and, overall, statistically significant; this supports the conclusion that the fund family performance and the money flow to the fund family are positively related. There is a highly significant positive relationship between the fund family’s flow growth and the lag fund family return. In line with previous studies, the majority of past researchers found a strong positive relationship between the flows and the performance variable for both fund and fund family level (Chevalier & Ellison, 1997; Sirri & Tufano 1998; DelGuercio & Tkac 2001; Berk & Green 2004; Nanda et al. 2004; Joo & Park 2011; Adrianto et al. 2019).

As the growth of the fund family flow is positively linked to the strategy of generating a star resulting from the high standard deviation, results concluded that the

investment in the fund family, calculated in the growth of the fund flow, implies that high-risk investment would yield high returns on investment. It is important to note that the coefficient of the main explanatory variable dummy star has a positive and statistically significant relationship with the dependent variable, indicating that the star fund family can increase the money flows. In contrast with the dummy star fund family, dummy poor fund family coefficients were negative but not statistically significant, thereby implying there are no significant money outflows due to poor funds in the fund family. This result can be understood in line with the previous studies of Goetzmann & Pales (1977), and Sirri & Tufano (1998), which find that poor performance in funds is not related to the money outflow at the individual-fund level due to the cognitive-dissonance bias. In addition, Nanada et al. (2004), and Joo & Park (2011) also recorded the same results at the fund family level.

The results in Table 5.18 show that the star fund families receive more money inflows when using the star fund ownership to define star fund families. The coefficient of dummy Star for all country sample is 0.942, which indicates that there is a strong positive relationship between having star funds and new money growth of fund families. When the fund family has a one-star fund the new money growth increases by 0.942 units. The coefficient of the dummy poor fund family shows a negative and insignificant relationship -0.175. There is no indication that investors withdrawing funds from poor families. Having a poor fund would not, therefore, result in money flowing out of fund families. The fund families have enough funds and are in a position to take on the strategy of creating stars since according to Guedj & Papastaikoudi (2004), the number of funds in the fund family is required to be sufficiently high to selectively promote their funds. In addition, the investors in fund family are sophisticated, and are not in a hurry to realise their winning funds (Grinblatt & Keloharju, 2000; Nanda et al. 2004).

Hence, the investors might not be influenced by the disposition effect, the unsophisticated investors' dispose of the funds that make a profit and sit on the losing funds (Shefrin & Statman 1985; Grinblatt & Kelohar 2000).

For individual country analysis, similar to overall fund family sample analysis, the coefficients of the variable past fund family returns are positive and, overall, statistically significant. The main explanatory variable dummy star fund family also has a positive and statistically significant relationship with the dependent variable for the four countries. This indicates that star funds can increase the cash flows for fund families in these countries. The results show that Saudi Arabia has a coefficient larger than other countries 0.975, and Pakistan has a smaller coefficient than other countries 0.645. Malaysia and Indonesia have similar coefficients 0.822 and 0.815, respectively. This means that having a one-star fund in the fund family leads to an increased flow of fund family by 0.975 for Saudi Arabia, 0.822 for Malaysia, 0.815 for Indonesia, and 0.645 for Pakistan.

For the dummy poor fund family coefficient, Indonesia exhibits different results from the other countries. The dummy poor coefficient for Indonesia was significantly negative -0.267. This means that the existence of poor funds in the fund family leads to money outflows. This result can be justified in that the investors in Indonesia have the disposition effect, they keep the winning fund too long and seek to sell losing funds too early. This result in line with the prospect theory in terms of loss aversion. While the results of the other countries are similar to the results of the overall fund family sample analysis, in which the dummy poor coefficients for these countries were insignificant. This means that there are no cash outflows due to the existence of poor funds in the fund family. In these countries, there is no evidence that fund family investors are

withdrawing funds out of poor families. Thus, having a poor fund would not lead to money flowing out of fund families.

Table 5.18: Fund Family Attributes Effect on N. M. G. at Fund Family Level

	Variables	Fund family	IFF	CFF
Malaysia	Constant	-0.592 (0.010)	-0.556 (0.014)	0.687 (0.442)
	Family Age	0.019 (0.000)**	0.058 (0.001)**	-0.007 (0.587)
	Number fund	0.045 (0.794)	-0.028 (0.546)	0.053 (0.024)**
	Family Size	0.253 (0.365)	0.622 (0.009)**	0.077 (0.319)
	Dummy Star	0.822 (0.001)**	0.815 (0.015)**	0.673 (0.027)**
	Dummy Poor	-0.019 (0.163)	-0.019 (0.570)	-0.019 (0.365)
	Past Family Returns	0.564 (0.0501)*	0.244 (0.045)*	0.443 (0.031)*
	Total risk	-0.323 (0.410)	-0.016 (0.981)	-0.043 (0.016)**
	Prob > F	0.0011	0.0000	0.0001
	Adjusted. R ²	0.74	0.67	0.66
	LM Test (Null hypothesis H0: Pooled)	221.31 (0.001)**	410.54 (0.001)**	261.61 (0.000)**
	Hausman Test (Null hypothesis H0: Random Effect)	437.10 (0.003)**	228.21 (0.431)	401.22 (0.000)**
Indonesia	Constant	-0.943 (0.017)	-0.796 (0.044)	-0.078 (0.000)
	Family Age	0.024 (0.000)**	0.048 (0.000)**	0.023 (0.218)
	Number fund	0.074 (0.170)	0.150 (0.013)*	0.056 (0.461)
	Family Size	0.896 (0.424)	0.727 (0.732)	0.664 (0.000)*
	Dummy Star	0.815 (0.011)**	0.751 (0.003)**	0.741 (0.001)**
	Dummy Poor	-0.267 (0.039)*	-0.474 (0.567)	-0.015 (0.043)*
	Past Family Returns	0.319 (0.002)**	0.850 (0.022)**	0.636 (0.006)**
	Total risk	-0.091 (0.002)*	-0.436 (0.445)	-0.808 (0.000)*
	Prob > F	0.0001	0.0005	0.0000
	Adjusted. R ²	0.63	0.55	0.57
	LM Test (Null hypothesis H0: Pooled)	338.21 (0.004)**	210.22 (0.002)*	431.21 (0.000)**
	Hausman Test (Null hypothesis H0: Random Effect)	258.20 (0.005)**	236.2 (0.075)	371.52 (0.002)**
Pakistan	Constant	-0.750 (0.248)	-0.407 (0.169)	-0.444 (0.618)
	Family Age	-0.005 (0.601)	0.043 (0.081)	-0.027 (0.007)*
	Number fund	0.012 (0.412)	-0.036 (0.116)	0.002 (0.956)
	Family Size	0.908 (0.362)	0.471 (0.405)	0.629 (0.172)
	Dummy Star	0.645 (0.001)**	0.478 (0.012)**	0.735 (0.001)**
	Dummy Poor	-0.075 (0.597)	-0.224 (0.459)	-0.172 (0.346)
	Past Family Returns	0.454 (0.023)*	0.316 (0.010)*	0.591 (0.048)*
	Total risk	-0.248 (0.277)	-0.484 (0.152)	-0.086 (0.765)
	Prob > F	0.0000	0.0000	0.0001
	Adjusted. R ²	0.62	0.59	0.69
	LM Test (Null hypothesis H0: Pooled)	310.41 (0.000)**	224.72 (0.004)**	327.61 (0.001)**
	Hausman Test (Null hypothesis H0: Random Effect)	234.20 (0.001)**	194.32 (0.431)	221.22 (0.004)**

Table 5.18, continued

	Variables	Fund family	IFF	CFF
Saudi Arabia	Constant	-0.383 (0.129)	-0.383 (0.129)	---
	Family Age	0.034 (0.049)*	0.034 (0.049)*	---
	Number fund	0.077 (0.022)*	0.077 (0.022)*	---
	Family Size	0.234 (0.186)	0.234 (0.186)	---
	Dummy Star	0.975 (0.001)**	0.975 (0.001)**	---
	Dummy Poor	-0.545 (0.640)	-0.545 (0.640)	---
	Past Family Returns	0.163 (0.018)**	0.163 (0.018)**	---
	Total risk	-0.502 (0.003)**	-0.502 (0.003)**	---
	Prob > F	0.0000	0.0000	---
	Adjusted. R²	0.62	0.62	---
	LM Test (Null hypothesis H0: Pooled)	368.81 (0.002)**	320.72 (0.006)*	321.6 (0.002)**
	Hausman Test (Null hypothesis H0: Random Effect)	288.50 (0.005)**	110.1 (0.201)	441.2 (0.003)**
	All	Constant	-0.466 (0.068)	-0.684 (0.360)
Family Age		0.014 (0.000)*	0.027 (0.002)**	-0.021 (0.532)
Number fund		0.012 (0.027)*	0.003 (0.046)*	-0.014 (0.620)
Family Size		0.386 (0.422)	0.034 (0.979)	0.433 (0.028)*
Dummy Star		0.942 (0.001)**	0.985 (0.010)**	0.344 (0.020)**
Dummy Poor		-0.175 (0.551)	-0.281 (0.219)	-0.088 (0.684)
Past Family Returns		0.149 (0.042)**	0.242 (0.025)**	0.107 (0.046)**
Total risk		-0.018 (0.010)*	-0.189 (0.049)*	-0.469 (0.241)
Prob > F		0.0000	0.0000	0.0000
Adjusted. R²		0.72	0.69	0.68
LM Test (Null hypothesis H0: Pooled)		278.81 (0.000)**	120.72 (0.006)**	261.6 (0.000)**
Hausman Test (Null hypothesis H0: Random Effect)		338.50 (0.003)**	319.01 (0.004)**	401.2 (0.000)**

Note: P-Value in brackets. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

This sub-section seeks to compare the effect of star (poor) fund family on the IFF new money growth and CFF new money growth for the overall fund family sample and individual countries sample. Star fund family has a positive significance for both the IFF and CFF 0.985 and 0.344, respectively. This means that star funds increase the cash inflows for both the IFF and CFF. The management team of the fund family succeeds in using the strategy of advertising the star funds in the fund family to attract more flows. At the same time, the poor fund family has a negative relationship with fund family new money growth, but is insignificant. The results are consistent with overall

fund family sample analysis results. Investors in both types of fund family do not withdraw funds out of poor fund families.

For the individual country analysis, the IFF and CFF in Malaysia and Pakistan report similar results for the overall fund family sample analysis. The star fund family has a positive significant relationship with fund family new money growth for Malaysia IFF, 0.815 and CFF, 0.673, and for Pakistan IFF, 0.478 and CFF, 0.735. While Indonesia shows different results for the CFF. The new money growth of the CFF in Indonesia has a positive significant relationship with the star fund family 0.741 and has a negative significant relationship with the poor fund family -0.015. This means that the existence of poor funds in the fund family leads to outflow money from the fund family. This result is similar to the results of the overall fund family sample for Indonesia. Investors in the CFF in Indonesia are unsophisticated and seek to get rid of poor funds. The IFF in Indonesia shows similar results to the IFF in Malaysia and Pakistan. It was positive for the star fund family 0.751 and insignificant for the poor fund families.

Fund Family New-Money Growth and Control Variables

Overall Fund Family and by Country

The previous section tests one of the important attributes of the fund family, having star funds on their funds. However, there are different fund family attributes that the investor takes into consideration when making a decision. Since most of the investors use the top-down approach it means they choose the fund family and then select the funds in the fund family. The attributes tested in this section are past fund family performance, the number of funds in the fund family, fund family age, fund family size, and total fund family risk.

The results of this sub-section, as shown in Table 5.18 in the previous sub-section, indicate that the coefficients of the variable past fund family returns are positive, and, overall, statistically significant; this supports the assumption that the performance of a fund family and the cash flow to the fund family are related positively. Results conclude that investment decisions are made depending on the performance of the entire fund families, rather than the performance of the individual fund. Therefore, investors in the fund family choose investment on a fund family basis, rather than on an individual fund basis. This has been seen in the performance persistence section, where results presented evidence of fund family performance persistence up to one month, whereas there is no evidence of poor performance persistency. This means that past better return information is only useful for up to one month and that using past poor fund returns as a guide for future selection of funds does not do good. This finding shows that historical returns impact flows positively, which is in line with previous studies (Sirri & Tufano 1998; DelGuercio & Tkac 2002; Nanda et al. 2004; Marzuki & Worthington 2015).

The coefficient of the number of funds in a fund family has a significant positive relationship with the fund flow growth 0.012. This means that any increase by one fund in the fund family leads to an increase in the fund family new money growth by 0.012. That is an interesting finding as it contradicts Nanda et al. (2004), and Joo & Park (2011). The evidence shows that investment capital is drawn to fund families providing significant sums of funds. It means that the strategy of providing more funds to a fund family helps encourage investment. Then, fund family investors are open to a fund family's number of funds. This means that investors in fund families are drawn to a fund family with a larger number of funds available.

This argument is in line with Massa (1998), and Khorana & Servaes (2005) who pointed out that fund families effectively capture the market share by product

proliferation. In addition, according to Guedj & Papastaikoudi (2004), the number of funds in the mutual fund family is required to be large enough to selectively promote their funds. Thus, the fund family can use the star-creating strategy and then attract more new money to the fund family. It is concluded that investors prefer to invest in fund families offering a wide variety of funds, likely for economic reasons, convenience or simplicity, and for easy portfolio management. However, as reported in this result, investors should be aware of the danger of putting all the capital into one fund family. At the same time, they have to be conscious of the trade-off between the convenience and simplicity they enjoy from investing in a fund family, and the greater risk they might suffer from the high commonality between funds in a fund family.

The coefficient of the fund family's age is significantly positively related to the new money flow growth in the fund family 0.014. This means that the increase of fund family age by one year leads to an increase in fund family money inflows by 0.014. That means older fund families with a higher reputation are growing faster than younger funds. This finding is explained by the fact that older fund families are more likely to have gained recognition among other fund families and therefore attract more cash inflows into fund family funds. This result disagrees with the results attested in Chevalier & Ellison (1997), DelGuercio & Tkac (2001), and Bergstresser & Poterba (2002). Whilst, the finding corresponds to the studies of Joo & Park (2011), and Yates (2007) who documented that flows are significantly related to fund family reputation calculated by fund family age. Nevertheless, Deaves (2004) and Sinha & Jog (2007) found that the fund family's age was insignificant in the flow model.

Total fund family risk is negative and significant with fund family new money growth -0.018, which means that any increases in the total risk by one unit leads to decreases in the fund family flows by 0.018. Investors withdraw their money from the

high-risk fund families, and, thus, prefer to direct their money to the less-risk fund families, as investors believe that the high-risk fund families may not compensate them with large future returns. The fund family's asset size is positive and insignificantly related to fund family flow growth. This means that the investors do not consider the size of fund families when making decisions. The explanation for this finding is that the operating and management expenses are perceived to increase when the fund family is larger.

The results of the individual countries' analyses are also summarised in Table 5.18. The results of the past returns of all countries are similar to the results of previous sections in that they are significantly positive. In contrast to the results of the all countries' sample analysis section, the results of the individual countries show that the number of funds within the fund family are insignificant for all countries except Saudi Arabia, which was significantly positive. This means that the investors of Malaysia, Indonesia, and Pakistan do not care about the number of funds in the fund family, but might care more about whether there are a number of star funds among these funds. These results are similar to the results of Nanda et al. (2004), and Joo & Park (2011). For Saudi Arabia, the result can be justified in attracting investment capital to fund families offering a large number of funds. It means that the strategy of providing more funds to a fund family helps encourage investment.

The results of fund family age are significantly positive for Saudi Arabia, Malaysia, and Indonesia, but insignificant for Pakistan. The coefficients are Saudi Arabia 0.034, Malaysia 0.019, and Indonesia 0.024. This indicates that older fund families in these countries attract more money inflows, which means older fund families, with a higher reputation, are growing faster than younger funds. The results of the fund family size are consistent with the results of the overall fund family sample

analysis, which was insignificant for all countries. This means that the investors of fund families do not include fund family size within the attributes of their choice of the fund family that they want to choose. This could be because increased flows and size are not necessarily beneficial to families if they are not properly invested and exploited.

Total fund family risk is negative and significant with fund family new money growth for Saudi Arabia and Indonesia -0.502 and -0.091, respectively, which means that any increases in the total risk by one unit leads to decreases in the fund family flows by 0.502 and 0.091. The investors believe that the high-risk fund families may not compensate them with large future returns. The results for Malaysia and Pakistan were negative but insignificant.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

This section discusses whether there is a difference between the impacts of fund family attributes on their new money growth between Islamic focused family (IFF) and conventional focused family (CFF). This section focuses on the three countries, Malaysia, Indonesia, and Pakistan. The same Table 5.18 presents the results of the impact of the fund family attributes on the IFF and CFF new money growth.

In Malaysia and Indonesia, fund family age is positively significant to the new money growth of the IFF, but is insignificant for the CFF. This means that investors in the IFF take the fund family age under consideration when making a decision. Any 1% increase in the fund family age leads to an increase in fund family money flows Malaysia 0.058 and Indonesia 0.048. This is because the older families have more experience and have more efficient team management. As investors in Islamic focused families have additional non-return goals, such as Islamic and ethical goals, which is why moving between families is more difficult for them, they seek to choose more

experienced families to avoid leaving them in the short term. In Pakistan, the results are different, fund family age is negatively significant for the CFF and insignificant for the IFF, which means that the investors of the CFF in Pakistan take the fund family age into consideration when making a decision. Any increase of 1% in fund family age leads to a decrease in fund family money flows by 0.027. The investors in the CFF are attracted to young families, which may be because they believed that the management team of old families are no longer able to manage it well. In addition, young families spend more on advertising and strategies to attract investors.

In Malaysia, the number of funds is positively significant to the new money growth of the CFF, but insignificant for the IFF. Any increase by one fund in the CFF leads to an increase in the CFF new money growth by 0.053. This means that investors in the CFF in Malaysia are attracted to the strategy of the increasing number of funds by fund families, since the fund families effectively capture market share by product proliferation. Moreover, the number of funds in the mutual fund family need to be large enough in order to promote their funds selectively. In Indonesia, the results were the opposite, the number of funds was positively significant to new money growth of the IFF 0.150, but insignificant to the CFF. In Pakistan, the number of funds was insignificant to both types of families.

In Malaysia, fund family size is positively significant to the IFF and insignificant to the CFF. This means that investors in the IFF consider the fund family size when making decisions. When fund family size increases by 1%, the fund family money flow increases by 0.622. The investors in the IFF in Malaysia believe that large families have the greatest opportunity to create new funds, and, thus, increase investment options within the same fund family, as investors in the IFF prefer to move within the funds in

the same fund family instead of moving between families due to the ethical and religious goals that they consider when making decisions.

In Indonesia, fund family size is positively significant for the CFF and insignificant for the IFF. When fund family size increases by 1%, the fund family money flows of the CFF increases by 0.664. The investors in the CFF in Indonesia believe that large families have economies of scale, and, thus, offer more liquidity and diversification, and, therefore, take size into consideration when making decisions. Fund family size was insignificant for both types of fund families in Pakistan.

In Malaysia and Indonesia, the total fund family risk is negative and significant with the CFF new money growth (-0.043 and -0.808, respectively), which means that any increases in the total risk by one unit leads to decreases in the fund family flows by 0.043 and 0.808, respectively. The investors in the CFF in Malaysia and Pakistan believe that the high-risk fund families may not compensate them with large future returns, while total fund family risk is insignificant with the IFF's new money growth. This means that the investors in the IFF do not care about fund family risk when making decisions, in that the Islamic investments exclude most traditional investments that are riskier, such as speculation. In addition, the investors in the IFF may have to invest in the risky families in order to achieve the Islamic and ethical goals that they seek. In Pakistan, total risk was also insignificant for both types of fund families.

5.3.3 The Spillover Effect

The spillover effect is a phenomenon in which a fund family shows its superior performance by getting certain star funds (Nanda et al. 2004) or by terminating a star fund (Zhao 2004), in order to draw the interest and investment of investors to other family funds. The test results in the previous sections show that because of the star fund

effect the money flow to star fund families is increasing. This section want to investigate whether the increase in the money flow to the star fund family is due directly to the money flow to the star fund(s) or also to the money flow to other funds in the fund family. Thus, investigating whether there is a spillover effect from star funds to the rest of the family's funds. Fund families typically introduce new funds to raise new capital as the cash flow to existing funds slows down. To check the spillover effect of star funds in families, it is therefore important to check the flow of money to other funds in the fund family.

This thesis seeks to contribute by using two types of star funds. Islamic star funds and conventional star funds. Actually, the sample of this thesis comprises the four countries having 65% of the equity Islamic mutual funds around the world (Malaysia, Saudi Arabia, Indonesia, and Pakistan). Therefore, this section run two regressions, first to test the spillover effect of the Islamic star funds, and, second, to test the spillover effect of the conventional star funds.

The Spillover Effect of Islamic Star Funds

Most fund families are mixed families, which means Islamic and conventional funds work together in the same fund family. The study of Islamic mutual funds is very important to Islamic investors, especially in countries with a large Muslim society like the countries under study in this thesis. Islamic star funds are important to attract Muslim investors, as Muslim investors are not interested in activities that are in conflict with Islamic *Sharia*. It is also interesting that non-Muslim investors are expected to be attracted to these funds as they are considered a type of socially responsible fund. Hence, it is assumed that the impact of Islamic star funds is positive on the growth of other funds in the fund family.

First, the Islamic star fund family is a fund family that has at least one Islamic star fund, and an Islamic poor fund family is a fund family that has at least one Islamic poor fund. Then, measure the money flow growth of non-star and non-poor peer funds in the fund family. Therefore, the primary coefficient of interest is the Islamic star (poor) fund dummy variable to test hypothesis number five. The predict a positive coefficient for the Islamic star dummy and a negative coefficient for the Islamic poor dummy if there is a spillover from the existence of an Islamic star and poor fund performer, respectively. For this purpose, construct a portfolio with all the funds in the fund family, excluding Islamic star and poor funds, and calculate the new-money growth for the portfolio as a dependent variable. The fund family attributes are used as control variables, and the exploratory variables are ISF – Islamic star fund, and IPF – Islamic poor fund.

The results of the regression are reported in Table 5.19. The coefficient of the main explanatory variable, the ISF dummy, is positive and significant, thereby supporting the existence of the spillover effect due to the star fund ownership. There is evidence of substantial flows to non-star performers belonging to the same fund family, as the star performer confirms the presence of a positive spillover effect in the fund family. The results show that the presence of an Islamic star fund provides a statistically significant contribution in the money flows of peer funds within the fund family. In economic terms, the money flow growth of funds from a star fund family is, on average, 0.778 percent higher than that of funds from families without a star performer. Therefore, the results find evidence of a positive spillover effect of star performers on the money flows of their peers in the fund family, which is consistent with Nanda et al. (2004) for conventional funds, and Adrianto et al. (2019) for SRI funds.

Table 5.19: Spillover Effect

	Variables	Islamic star (poor)	Conventional star (poor)
Malaysia	Constant	-0.594 (0.360)	-0.820 (0.107)
	Family Age	0.020 (0.021)**	0.002 (0.660)
	Number fund	-0.020 (0.628)	0.014 (0.027)*
	Family Size	-0.884 (0.454)	0.232 (0.030)**
	Dummy Star	0.873 (0.000)**	0.211 (0.000)**
	Dummy Poor	-0.502 (0.519)	-0.580 (0.001)**
	Past Family Returns	0.915 (0.038)**	0.389 (0.050)**
	Total risk	-0.596 (0.216)	-0.203 (0.029)
	Prob > F	0.0000	0.0001
	Adjusted. R²	0.62	0.66
	LM Test (Null hypothesis H0: Pooled)	146.30*** (0.000)	312.36 (0.003)**
	Hausman Test (Null hypothesis H0: Random Effect)	247.11 (0.001)***	241.12 (0.001)**
	Indonesia	Constant	-0.824 (0.056)
Family Age		0.011 (0.031)**	0.024 (0.040)**
Number fund		0.003 (0.969)	0.007 (0.935)
Family Size		0.394 (0.062)	-0.657 (0.332)
Dummy Star		0.414 (0.000)**	0.419 (0.000)**
Dummy Poor		-0.670 (0.071)	-0.308 (0.000)**
Past Family Returns		0.218 (0.002)**	0.601 (0.008)**
Total risk		-0.323 (0.265)	-0.488 (0.345)
Prob > F		0.0005	0.0002
Adjusted. R²		0.60	0.54
LM Test (Null hypothesis H0: Pooled)		271.12*** (0.000)	362.53 (0.002)**
Hausman Test (Null hypothesis H0: Random Effect)		314.71 (0.001)***	320.12 (0.000)**
Pakistan		Constant	-0.607 (0.324)
	Family Age	-0.008 (0.471)	0.010 (0.360)
	Number fund	0.031 (0.123)	0.030 (0.179)
	Family Size	0.447 (0.228)	0.536 (0.159)
	Dummy Star	0.522 (0.001)**	0.630 (0.000)**
	Dummy Poor	0.215 (0.174)	-0.159 (0.000)**
	Past Family Returns	0.358 (0.031)**	0.132 (0.011)**
	Total risk	-0.113 (0.619)	-0.104 (0.661)
	Prob > F	0.0000	0.0001
	Adjusted. R²	0.59	0.69
	LM Test (Null hypothesis H0: Pooled)	322.40*** (0.003)	221.03 (0.001)**
	Hausman Test (Null hypothesis H0: Random Effect)	304.51 (0.000)***	370.22 (0.000)**

Table 5.19, continued

	Variables	Islamic star (poor)	Conventional star (poor)
Saudi Arabia	Constant	0.696 (0.109)	---
	Family Age	0.006 (0.010)*	---
	Number fund	-0.001 (0.945)	---
	Family Size	-0.242 (0.007)**	---
	Dummy Star	0.485 (0.000)**	---
	Dummy Poor	0.573 (0.070)	---
	Past Family Returns	0.458 (0.001)**	---
	Total risk	0.056 (0.832)	---
	Prob > F	0.0001	---
	Adjusted. R²	0.85	---
	LM Test (Null hypothesis H0: Pooled)	252.30*** (0.002)	211.35 (0.000)**
	Hausman Test (Null hypothesis H0: Random Effect)	254.21 (0.004)***	215.22 (0.003)**
All	Constant	-0.031 (0.912)	-0.499 (0.097)
	Family Age	0.019 (0.000)**	0.001 (0.716)
	Number fund	0.040 (0.502)	0.022 (0.110)
	Family Size	0.034 (0.029)**	0.295 (0.016)**
	Dummy Star	0.778 (0.000)**	0.926 (0.000)**
	Dummy Poor	-0.300 (0.701)	-0.883 (0.000)**
	Past Family Returns	0.558 (0.009)*	0.237 (0.000)**
	Total risk	-0.031 (0.865)	0.237 (0.244)
	Prob > F	0.0000	0.0000
	Adjusted. R²	0.83	0.81
	LM Test (Null hypothesis H0: Pooled)	112.10*** (0.001)	351.23 (0.000)**
	Hausman Test (Null hypothesis H0: Random Effect)	214.21 (0.001)***	410.42 (0.001)**

Note: P-Value in brackets. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Therefore, the reputation of Islamic fund families in generating outstanding financial performers is a positive signal that Islamic investors utilise when they select Islamic funds. Investors are drawn to peer funds from star families with the expectation of yielding future incomes based on past performance. The analysis extends this spillover argument to Islamic poor funds as well as to test whether having at least one Islamic poor fund would conversely result in substantial cash outflows from peer funds in the fund family.

The coefficient of IPF dummy is negative but not statistically significant, and poor funds do not have a meaningful negative spillover effect on other funds. In focusing on

the results for the spillover effects of poor performers on the money flow of peer funds, having an Islamic fund with performance (four-factor Alpha) below the 5th percentile does not have a significantly adverse effect on the money flow of peer funds within the fund family. This result suggests that Islamic investors are less responsive to poor performer funds in the fund family. For individual countries, Table 5.19 also reports the results of individual countries. The results conclude that all countries have similar results for the overall fund family sample results. The ISF dummy is positively significant, and the IPF dummy is insignificant. This means that the presence of Islamic star funds in the fund family of these four countries provides a statistically significant contribution in the money flows of peer funds within the fund family. However, the presence of Islamic poor funds in the fund family of these four countries does not lead to withdrawing money from the fund family.

The Spillover Effect of Conventional Star Funds

This sub-section seeks to test hypothesis number six, which was motivated by the coexistence of conventional and other funds in the same fund family. This sub-section seek to investigate whether the performance of conventional funds affects the money flows of peer funds in the same fund family. Identify a conventional star (poor) fund family as a fund family with at least one star (poor) conventional fund. As before, a star (bad) conventional fund has a four-factor Alpha above (below) the 95th (5th) percentile of monthly performance. Table 5.19 presents the regression results for the conventional fund families. A conventional Star (poor) fund family takes a value of one if the fund family has a star (poor) conventional fund, and zero otherwise.

Similar to the Islamic star funds, the results show that a conventional star fund has a positive significant coefficient, showing evidence for the prediction that a

conventional star fund provides a substantial contribution to the money flow of peer funds in the fund family. This result is similar to the results provided by Nanda et al. (2004), and Joo & Park (2011) for conventional fund families. In addition, the results of individual counters analysis show similar results for the overall fund family sample. Interestingly, the results related to the conventional poor funds appeared to contrast with the results in the Islamic poor fund for the overall fund family sample and individual countries. The results show that this CPF Dummy has a negative significant coefficient, which means that investors in conventional poor-performing funds withdraw their money from these funds in order to minimise further losses. This suggests that, on average, extremely poor performance (lowest-ranked performance) causes cash outflows from fund families. This can be explained by the fact these investors in conventional funds are free to move between funds, and benefit from the advantage that they can invest in Islamic funds, unlike Muslim investors who cannot invest in conventional funds. This result is contrary to the findings of Joo & Park (2011) for the conventional fund family, who found that poor performers' funds do not experience fundamental outflows.

5.3.4 Summary and Discussion

This empirical part of the thesis presents evidence concerning the mutual fund family flows calculated using new money growth. First, examine whether the strategy to announce the existence of star funds in the fund family benefits the fund family by increasing the money flows. In addition, explore the fund family attributes most used by investors when making decisions. Then, expand the analysis by testing the spillover effect of the existence of star funds in the fund family. In other words, test whether the presence of star funds increases the money inflows to the funds themselves only or

increases the money inflows into other funds in the fund family. Finally, provide new evidence about the spillover effect of the existence of Islamic star funds and compare it with conventional star funds.

The overall results of the effect of star fundholding on fund family new-money growth accept hypothesis number four about the star funds, in that the results indicate that having at least one-star fund leads to increases in the new money growth of fund family, while having at least one poor fund does not have any impact on the new money growth of the fund family. This means that having poor funds does not lead to a decrease in the new money growth of the fund family. For the individual country analysis, the results were similar to the overall fund family sample analysis except Indonesia. The results for Indonesia indicate that having poor funds leads to a decrease in the new money flow of the fund family.

The results showed investors make investment decisions based on the fund family's past return included star funds, possibly because of inefficient information. This result is consistent with Representative Heuristic Theory where investors appear to be excessively positive about past winners' results and excessively pessimistic about past losers' results. In addition, the Prospect Hypothesis which suggests that people judge gains and losses differently and that they value gains more than losses, known as the impact of certainty. When one is given two equivalent choices, with a possible benefit option and a potential loss option, their decision would be based on the expected benefit rather than the loss, even though both options produce identical economic results. In fact, all included fund family attributes as control variables are significantly related to the fund family flow growth whether for the overall fund family sample or the Islamic focused family and conventional focused family. These results imply that the fund family attributes carry significant weight in the investment decision in fund

families. These results are in line with Massa (1998) and Khorana & Servaes (2005). Generally, the investors in fund families are sophisticated, and are not in a hurry to realise their winning funds. The results of the test on the impact of fund family attributes on the fund family new money flows, which means that the fund family attributes contribute to the new money growth of the fund family.

The results found an asymmetric response in the money flow of peer funds to the presence of Islamic star and poor performing funds in the fund family. To be precise, the results only support a spillover effect in fund families in the presence of an Islamic star fund. Therefore, consistent with Nanda et al. (2004) for conventional fund families and Adrianto et al. (2019) for SRI fund families, results find that Islamic star performers provide a positive contribution to the money flow of peer funds in the same fund family. However, and more importantly, results find that having an Islamic poor performing fund does not have a similar negative spillover effect on the money flow of peer funds within the fund family. This result suggests that Islamic investors are less responsive to poor fund performance, in line with the loyalty of Islamic investors. The results accept hypothesis number five regarding the Islamic star fund, which indicates that Islamic star funds positively contribute to the new money growth of the fund family. No evidence was found to indicate that the Islamic poor fund contributes to the new money growth of the fund family.

For conventional star funds, contrary to the results of the Islamic star funds, results did not find an asymmetric response in the money flow of peer funds to the presence of conventional star and poor performing funds in the fund family. The results support a spillover effect in fund family in the presence of a conventional star fund. Therefore, results find conventional star performers provide a positive contribution to the money flow of peer funds in the same fund family. However, results also find that

having conventional poor funds has a negative spillover effect on the cash flow of peer funds within the fund family. This result suggests that conventional investors are responsive to poor fund performance. This is because, unlike Islamic investors, conventional investors do not standardise restrictions on their investments, their ultimate goal is diversification and profit. These results accept hypothesis number six regarding conventional star and poor funds, which states that having a conventional star fund positively contributes to the new money of peer funds within the fund family, having a conventional poor fund negatively contributes to the new money growth of peer funds in the family. For the summary of hypotheses and results see appendix 6.

5.4 Future Performance of Star Fund Families

The results have observed thus far that star funds draw cash flows to a fund family, including other funds within the fund family. This assume this result holds because investors expect star fund families to have better management capabilities; thus, they are willing to commit new investment capital to funds in those families. This section examines whether star fund families provide better returns than non-star fund families as investors expect, in addition to examining whether star fund families have the capability of maintaining their star fund family status in the future. Section 5.4.1 presents the results of the star fund family future performance persistence. Section 5.4.2 provides the results of the analysis of the star fund holding persistency, and Section 5.4.3 provides the summary and discussion.

5.4.1 Star Fund Family Future Performance

This section seeks to test the future performance of fund family with star (poor funds). The investors direct their money to the star families because they expect the star

families to have better management capabilities and to achieve good performance in the future. This allows us to determine whether star fund families provide better returns in the future as investors expect. This analysis will be applied to the two samples. First, the analysis of the overall fund family includes by individual country, and second, the analysis of the Islamic focused family and conventional focused family.

Overall Fund Family and by Country

This sub-section summarises the findings of the regression used to test the future performance of fund family for all country samples. The analysis use the future risk-adjusted return calculated using Carhart four-factor model as dependent variable and use two main explicatory variables (dummy Star and dummy poor) as independent variables. Table 5.20 shows that the coefficient dummy star is positive and significant, this means that the future performance of star fund ownership families is greater than the other fund families. Can noted a persistence in the performance of fund families that hold a star fund. The better performance of star fund families in this sub-section is plausible since many previous studies (Grinblatt & Titman 1992; Goetzmann & Ibbotson 1994) report the results of tests that support fund performance persistence. However, the results show that the coefficients of dummy poor show a statistically insignificant coefficient, and, therefore, they are not related to the future performance of fund families. The coefficient of the dummy star is positively significant and equal 0.024, and dummy poor is negatively insignificant and equal -0.015.

Table 5.20 also summarises the results of the regression used to test the future performance of fund family level for individual countries. The results of the main explanatory variable exhibit that the dummy star variable is significantly positive for all countries. These results are similar to the results of the overall fund family sample

analysis. This means that there is positive persistence in the performance of fund families holding a star fund in the four countries under study. The coefficients of a dummy star are positively significant and equal for Malaysia, 0.023, Saudi Arabia 0.085, Indonesia 0.046, and Pakistan 0.022.

The results show that the coefficients of dummy poor show statistically insignificant for Saudi Arabia, Malaysia, and Pakistan, which means that having poor funds in the family in these countries is not related to the future performance of fund families.

Table 5.20: Future Performance of Star Fund Family

	Variables	Fund family	IFF	CFF
Malaysia	Constant	-0.066 (0.003)	-0.171 (0.345)	-0.056 (0.457)
	Family Age	0.013 (0.057)**	0.018 (0.035)**	0.007 (0.340)
	Number fund	-0.015 (0.010)*	-0.032 (0.226)	-0.072 (0.602)
	Family Size	0.009 (0.465)	0.482 (0.211)	-0.238 (0.050)**
	Dummy Star	0.023 (0.018)**	0.026 (0.022)**	0.077 (0.032)*
	Dummy Poor	-0.023 (0.614)	-0.042 (0.240)	-0.025 (0.021)*
	Past Family Returns	0.551 (0.000)*	0.174 (0.035)*	0.343 (0.003)*
	Total risk	-0.007 (0.614)	-0.132 (0.009)**	-0.071 (0.989)
	Prob > F	0.0001	0.0004	0.0002
	Adjusted. R ²	0.53	0.61	0.63
	LM Test (Null hypothesis H0: Pooled)	118.21 (0.003)**	170.22 (0.001)**	225.11 (0.000)**
	Hausman Test (Null hypothesis H0: Random Effect)	218.20 (0.002)**	214.17 (0.760)	251.51 (0.001)**
	Indonesia	Constant	-0.046 (0.329)	-0.511 (0.029)
Family Age		0.004 (0.032)*	0.010 (0.000)*	-0.027 (0.616)
Number fund		0.003 (0.026)*	0.006 (0.441)	0.005 (0.002)*
Family Size		0.053 (0.026)**	0.642 (0.001)*	0.322 (0.003)*
Dummy Star		0.046 (0.020)**	0.025 (0.001)**	0.034 (0.001)**
Dummy Poor		-0.032 (0.033)**	-0.017 (0.683)	-0.011 (0.023)*
Past Family Returns		0.473 (0.000)**	0.722 (0.003)**	0.022 (0.042)**
Total risk		0.031 (0.165)	0.248 (0.003)*	0.019 (0.542)
Prob > F		0.0000	0.0000	0.0007
Adjusted. R ²		0.74	0.81	0.75
LM Test (Null hypothesis H0: Pooled)		224.51 (0.002)**	240.12 (0.002)**	230.21 (0.000)**

Table 5.20, continued

	Variables	Fund family	IFF	CFF
	Hausman Test (Null hypothesis H0: Random Effect)	352.30 (0.001)**	211.18 (0.419)	201.02 (0.000)**
Pakistan	Constant	-0.143 (0.002)	-0.139 (0.167)	-0.204 (0.180)
	Family Age	0.001 (0.070)	0.009 (0.000)**	0.006 (0.717)
	Number fund	-0.003 (0.771)	0.004 (0.206)	-0.007 (0.296)
	Family Size	0.082 (0.294)	-0.208 (0.259)	0.149 (0.574)
	Dummy Star	0.022 (0.023)**	0.001 (0.050)**	0.035 (0.001)**
	Dummy Poor	-0.036 (0.611)	-0.004 (0.798)	-0.024 (0.325)
	Past Family Returns	0.366 (0.000)**	0.207 (0.018)**	0.153 (0.017)**
	Total risk	-0.024 (0.127)	0.033 (0.195)	-0.035 (0.471)
	Prob > F	0.0000	0.0001	0.0006
	Adjusted. R ²	0.62	0.65	0.69
		LM Test (Null hypothesis H0: Pooled)	210.71 (0.000)**	221.62 (0.006)**
	Hausman Test (Null hypothesis H0: Random Effect)	315.30 (0.003)**	204.51 (0.403)	211.12 (0.000)**
Saudi Arabia	Constant	0.064 (0.209)	0.064 (0.209)	---
	Family Age	0.004 (0.591)	0.004 (0.591)	---
	Number fund	-0.002 (0.403)	-0.002 (0.403)	---
	Family Size	-0.017 (0.860)	-0.017 (0.860)	---
	Dummy Star	0.085 (0.001)**	0.085 (0.001)**	---
	Dummy Poor	-0.022 (0.173)	-0.022 (0.173)	---
	Past Family Returns	0.515 (0.000)**	0.515 (0.000)**	---
	Total risk	0.039 (0.185)	0.039 (0.185)	---
	Prob > F	0.0000	0.0000	---
	Adjusted. R ²	0.55	0.55	---
		LM Test (Null hypothesis H0: Pooled)	218.31 (0.001)**	120.12 (0.003)**
	Hausman Test (Null hypothesis H0: Random Effect)	338.50 (0.003)**	201.11 (0.491)	---
All	Constant	-0.025 (0.233)	0.007 (0.974)	-0.450 (0.004)
	Family Age	-0.012 (0.284)	0.002 (0.451)	0.009 (0.154)
	Number fund	0.001 (0.257)	0.003 (0.678)	0.008 (0.550)
	Family Size	0.058 (0.140)	-0.501 (0.186)	0.584 (0.062)
	Dummy Star	0.024 (0.026)**	0.034 (0.031)**	0.043 (0.050)**
	Dummy Poor	-0.015 (0.245)	-0.055 (0.410)	-0.254 (0.020)*
	Past Family Returns	0.865 (0.000)	0.893 (0.000)	0.153 (0.906)
	Total risk	-0.005 (0.678)	-0.233 (0.090)	0.289 (0.353)
	Prob > F	0.0000	0.0000	0.0000
	Adjusted. R ²	0.79	0.68	0.84
		LM Test (Null hypothesis H0: Pooled)	226.41 (0.001)**	220.32 (0.001)**
	Hausman Test (Null hypothesis H0: Random Effect)	238.30 (0.003)**	301.32 (0.531)	201.12 (0.000)**

Note: P-Value in brackets. 'All' includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

The coefficients of dummy poor are negatively insignificant and equal for Malaysia -0.023, Saudi Arabia -0.022, and Pakistan -0.036, while, in Indonesia, the

results are in conflict with the results of the overall fund family sample analysis; the coefficient of dummy poor is significantly negative and equal -0.032. This means that there is evidence of the existence of negative persistence in the performance of fund families holding poor funds in Indonesia. This supports the dumb-money effect at the fund family level in Indonesia only.

Islamic Focused Family (IFF) vs. Conventional Focused Family (CFF)

This sub-section summarises the results of the regression used to test the future performance of Islamic focused family and conventional focused family. In line with previous subsections, the main explanatory variables want to test in this sub-section are “dummy star and dummy poor” variables, to investigate the future performance for the Islamic and conventional focused families.

The results show that both types of fund families have a positive persistence, which means that the dummy star variable is significantly positive with future performance. The future performance of the star fund ownership for Islamic and conventional focused families is better than the other fund families, which means that there is positive persistence in the performance of Islamic and conventional focused families holding star funds. On the other hand, the results show that the coefficients of dummy poor show a statistically insignificant coefficient for Islamic focused families, and, therefore, they are not related to the future performance of Islamic focused families. The results did not find evidence about the negative persistence in the Islamic focused family. This means that having poor funds in the Islamic focused family does not have any effect on the future performance of the Islamic focused family. However, the results of the conventional focused families are different from the results of the Islamic focused family. The coefficient dummy poor was significantly negative, which

means that there is evidence about the negative persistence in the conventional fund families.

For individual country analysis, the results find evidence of the positive persistence for both types of fund families in all countries. The coefficients of dummy stars are positive and significant for Islamic and conventional focused families in all countries. In addition, the results find the negative persistence effect in Malaysia and Indonesia for conventional focused families only. The coefficients of dummy poor are negative and significant in these countries, and insignificant for conventional focused families in Pakistan. However, the results did not find any evidence about the negative persistence in the Islamic fund families in all countries.

5.4.2 Star Fund Holding Persistency and Star Fund Family Characteristics

Finally, this sub-section seeks to test the last hypothesis, which is that fund families have the capability of preserving their star fund family in the future. This sub-section check whether a fund family with a star fundholding in the past is more likely to hold potential star funds. This sub-section seek to determine the attributes of the star fund family that lead to this persistence. The results are reported in Table 5.21. In this sub-section, using the dummy star as the dependent variable (binary variable). If the regression coefficient for dummy star (dummy poor) is positive (negative) and statistically significant, the present star fund family has a high (low) opportunity of having a star fund in the following twelve months.

The important explanatory variable "dummy star" has coefficients that are positive and statistically significant, thereby supporting the hypothesis that the fund families with star fund holding have the capability to persistently a hold star fund in the future. Table 5.21 also reports the results of the individual countries' analysis; the

results for the four countries under study appear the same as the results for the overall fund family sample analysis.

For the Islamic focused family and conventional focused families, the results show that both types of fund families in all countries (Malaysia, Indonesia, and Pakistan) have a positively significant dummy star coefficient. This means that both Islamic and conventional families have the capability of maintaining the possession of star funds in the future.

Table 5.21: Star Fund Holding Persistency

	Variables	Fund family	IFF	CFF
Malaysia	Constant	-0.061 (0.809)	-0.564 (0.050)	-0.644 (0.070)
	Family Age	-0.009 (0.672)	-0.001 (0.533)	0.002 (0.507)
	Number fund	0.009 (0.018)**	0.027 (0.003)**	0.011 (0.085)
	Family Size	0.810 (0.013)	0.371 (0.000)	0.771 (0.028)**
	Dummy Star	0.477 (0.001)**	0.235 (0.016)**	0.576 (0.010)**
	Dummy Poor	-0.013 (0.947)	-0.042 (0.439)	-0.035 (0.755)
	Past Family Returns	0.651 (0.001)*	0.811 (0.000)*	0.339 (0.031)*
	Total risk	0.167 (0.305)	-0.120 (0.549)	0.237 (0.314)
	Prob > F	0.0001	0.0000	0.0000
	Adjusted. R²	0.76	0.83	0.79
	Indonesia	Constant	-0.335 (0.001)	-0.535 (0.547)
Family Age		0.003 (0.445)	-0.008 (0.229)	0.019 (0.008)*
Number fund		0.006 (0.010)	0.019 (0.050)	0.004 (0.869)
Family Size		-0.157 (0.001)*	0.416 (0.508)	-0.163 (0.005)*
Dummy Star		0.259 (0.004)**	0.176 (0.020)**	0.103 (0.015)**
Dummy Poor		-0.053 (0.652)	-0.246 (0.085)	-0.069 (0.557)
Past Family Returns		0.529 (0.029)**	0.358 (0.693)	0.878 (0.018)**
Total risk		0.189 (0.306)	0.842 (0.009)*	-0.276 (0.233)
Prob > F		0.0002	0.0004	0.0005
Adjusted. R²		0.80	0.83	0.82
Pakistan		Constant	-0.362 (0.452)	0.570 (0.416)
	Family Age	0.002 (0.746)	-0.006 (0.720)	0.021 (0.438)
	Number fund	0.015 (0.159)	0.002 (0.880)	0.050 (0.154)
	Family Size	-0.007 (0.216)	-0.004 (0.797)	-0.456 (0.043)*
	Dummy Star	0.256 (0.004)**	0.332 (0.006)**	0.122 (0.038)**
	Dummy Poor	-0.022 (0.827)	-0.250 (0.165)	-0.058 (0.663)
	Past Family Returns	0.646 (0.049)**	0.658 (0.016)**	-0.149 (0.905)
	Total risk	-0.075 (0.656)	-0.228 (0.325)	-0.758 (0.009)**
	Prob > F	0.0003	0.0043	0.0026
	Adjusted. R²	0.68	0.68	0.70

Table 5.21, continued

	Variables	Fund family	IFF	CFF
Saudi Arabia	Constant	0.359 (0.017)	0.359 (0.017)	---
	Family Age	-0.005 (0.805)	-0.005 (0.805)	---
	Number fund	0.010 (0.030)*	0.010 (0.030)*	---
	Family Size	-0.733 (0.014)**	-0.733 (0.014)**	---
	Dummy Star	0.411 (0.010)**	0.411 (0.010)**	---
	Dummy Poor	-0.054 (0.328)	-0.054 (0.358)	---
	Past Family Returns	0.750 (0.000)**	0.750 (0.000)**	---
	Total risk	-0.037 (0.687)	-0.037 (0.687)	---
	Prob > F	0.0000	0.0000	---
	Adjusted. R²	0.85	0.85	---
All	Constant	-0.236 (0.025)	-0.450 (0.004)	-0.240 (0.265)
	Family Age	0.002 (0.835)	0.009 (0.154)	0.003 (0.262)
	Number fund	0.019 (0.000)**	0.008 (0.550)	0.014 (0.015)**
	Family Size	-0.457 (0.619)	-0.584 (0.062)	0.694 (0.051)*
	Dummy Star	0.442 (0.001)**	0.451 (0.010)**	0.457 (0.000)**
	Dummy Poor	-0.035 (0.337)	-0.031 (0.961)	-0.012 (0.957)
	Past Family Returns	0.264 (0.002)**	0.282 (0.004)**	0.937 (0.093)
	Total risk	-0.100 (0.437)	-0.062 (0.416)	-0.016 (0.610)
	Prob > F	0.0000	0.0000	0.0000
	Adjusted. R²	0.79	0.85	0.80

Note: P-Value in brackets. ‘All’ includes Saudi Arabia, Malaysia, Indonesia, and Pakistan for IFF and Malaysia, Indonesia, and Pakistan for CFF as none resident in Saudi Arabia.

Finally, this section would like to ascertain the attributes of the star fund families that will contribute to the fund families to continue as star families in the future. That is a very arduous task as many factors can contribute to a fund family’s performance. This sub-section is therefore limited to the most general variables in which past research on fund management has led us to consider as being plausible, firm-specific factors in fund management. First, the results find that the variable, past fund family performance, has coefficients that are positive and significant. This indicates that the good performance of the fund family in the past does contribute to the star fund family remaining as a star fund family in the future, and it does provide a good signal about the fund family; as shown in Table 5.21. This conjecture is further reinforced by the fact that there is a positive coefficient for the number of funds in the fund family. This suggests a fund family with more funds would have a better chance of becoming a fund family of star

funds. However, the fund family age, fund family size, and total risk have an insignificant coefficient, which means that the fund family age, fund family size, and total risk do not necessarily contribute to the star fund family remaining as a star fund family in the future.

5.4.3 Summary and Discussion

This empirical part of the thesis presents new evidence about the future performance of fund families. First, examine the positive and negative persistence at the fund family level. The analysis focus on how the existence of star and poor funds in the fund family affects future performance. Then, expand the analysis by using the dummy star variable as a dependent variable (binary variable) to explore whether fund families with star funds are capable of maintaining the star situation in the future, as well as identify the fund family attributes that contribute to the fund families to remain as star families in the future.

For the positive and negative persistence, the results indicate that the fund families with star funds achieve better performance in the future than the families without star funds. These results are found in all analyses samples (overall fund family analysis, individual country sample analysis, Islamic and conventional focused family samples analysis). Evaluation of the presence and persistence of managerial performance is a critical test of the Efficient Market Hypothesis. Evidence of performance persistence would support the rejection of an efficient market in a semi-strong form. The existence of investors capable of expectation and making abnormal gains indicates that the market is not completely informationally efficient. When the market is efficient there should be no signs of performance persistence, and a random walk pattern will accompany the fund prices.

This result is similar to the results of Joo & Park (2011) for the Korean fund families. These results accept hypothesis number seven, which indicates that fund families with star funds continue to outperform in the future, as investors would expect. This is due to the investors choosing families with star funds because they expect that they will be rewarded in the future, and, thus, continue to perform well. However, only conventional focused families have negative persistence, which means having poor funds in the conventional focused families lead to outflows in the future. The main objective of the conventional focused family is to maximise profits at a defined level of risk, while the Islamic focused families have other aims like religion and morals. Therefore, it is easy for conventional focused family investors to change fund family when the performance is bad, but Islamic focused family investors have investment restrictions making it harder to change to other families; most funds in IFF are Islamic funds. These results are similar to the results of Adrianto et al. (2019) for conventional fund family and social responsibility fund family.

For the star fundholding persistence, the results accept hypothesis number eight, which means that the fund family has the capability of maintaining its star fund family status in the future. In addition, the results found that the past fund family performance and number of funds within the fund family contribute to the fund families to remain as star families in the future. For the summary of hypotheses and results see appendix 6.

5.5 Overall Summary

In the first analysis, the results concluded that the fund family managers take benefit from the advantages provided by families, thus have good selectivity skills. On the other hand, the results indicated that the managers of the fund family still have poor timing ability. In addition, Islamic focused family managers outperform conventional

focused families using all five measures, which indicates that Islamic focused family managers have better selectivity skills than conventional fund family managers. Although both types of fund family exhibit poor market timing ability, conventional focused family managers exhibit better timing ability compared to Islamic focused family managers.

The results also concluded that the fund families use their strategies and attributes to improve their performance. The strategy of having at least one-star fund in their funds to provide a good signal about the fund family and their management team. While, having poor funds in the fund family provide bad signal about the fund family and their management team. The results also showed that Islamic focused family performance was less affected by other fund family attributes than a conventional focused family performance. The results of fund family performance persistence found evidence of the hot-hand phenomenon. Nevertheless, this effect is only up to one month. Investors in fund families may use past information for up to one month as a helpful portion of their investment decision-making process. No icy-hand is reported in the results. The hot-hand fund family has a positive relationship with the superior performance of the overall fund family and the economic gain of investors.

In the second analysis, exploring the investor response to star ranking funds provided evidence of obvious star identity and a spillover effect in the fund families. Some possible explanations for the findings are as follows. First, investors do perceive that the historical superior performance would promise future excess returns. Second, the disposition effect does not exist in the fund families' market. Funds that make money are retained, and funds that do not are disposed of. Third, investors in the fund families become more sophisticated and they are not in a hurry to sell the winning funds; as documented by Grinblatt & Keloharju (2000), sophisticated investors are expected

to behave differently from unsophisticated investors. The results showed that all the other included fund family attributes are significantly related to the fund family flow growth for the overall fund family sample as well as the Islamic focused family and conventional focused family. These results imply that the fund family's attributes carry significant weight in the investment decision in fund families.

As novel evidence provided by this thesis, the results concluded that there is an asymmetric response in the flow of peer funds to the presence of Islamic star and poor performing funds in the fund family. The results find that Islamic star performers provide a positive contribution to the money flow of peer funds in the same fund family. However, the results find that having an Islamic poor performing fund does not have a similar negative spillover effect on the money flow of peer funds within the fund family. Although, the results did not find an asymmetric response in the flow of peer funds to the presence of conventional star and poor performing funds in the fund family, the results did find that conventional star performers provide a positive contribution to the cash flow of peer funds in the same fund family. However, also find that having conventional poor funds has a negative spillover effect on the cash flow of peer funds within the fund family.

In the third analysis, the results conclude that a positive persistence exists at the fund-family level when investors select a fund from a star fund ownership fund family. The results also found evidence about the positive persistence on the Islamic and conventional focused family. In addition, the results find new evidence about the negative persistence on the conventional focused family only. The results also concluded that the fund families with star fund holding have the capability to persistently hold a star fund in the future. Finally, the results concluded that some of the fund family attributes like past fund family performance and the number of funds within

the fund family give the fund family a greater chance of maintaining their star fund family status in the future.

Table 5.22: Summary of Hypotheses and Results

Hypothesis	Hypothesis	Expected Sign	Results	Table
Performance				
H1	Fund family managers exhibit good selectivity skills and market timing ability.	+	Mixed	Table 5.3 Table 5.4 Table 5.5, Table 5.6
H1.A	Selectivity and timing ability of Islamic focused family (IFF) differs from conventional focused family (CFF).	+	+	Same Previous Tables
H2	Having star (poor) fund in the fund family impact positively (negatively) on fund family performance.	+ (-)	+(-)	Table 5.10
H2.A	The impact of having star (poor) funds on performance is different between Islamic and conventional focused family.	+	Mixed	Same Previous Table
H3	Well-performing (bad performing) fund families continue to perform well (badly) in the subsequent periods	+ (-)	Mixed/NS	Table 5.11 Table 5.12 Table 5.13
H3.A	Performance persistence in Islamic focused family (IFF) is different from the conventional focused family (CFF).	+	+	Table 5.11 Table 5.12 Table 5.13
Flows				
H4	A star (poor) constituent fund contributes positively (negatively) to fund family new money growth.	+ (-)	+/(N.S)	Table 5.16
H4.A	The contribution of existence star (poor) funds to IFF new money growth differ from CFF new money growth.	+	Mixed	Same Previous Table
H5	Islamic star (poor) fund positively (negatively) contributes to the new money growth of peer funds in the same fund family.	+ (-)	+/N.S	Table 5.17
H6	Conventional star (poor) fund positively (negatively) contributes to the new money growth of peer funds in the same fund family.	+ (-)	+(-)	Same Previous Table

Table 5.22, continued

Future Performance				
H7	Fund families with star (poor) funds continue to outperform (underperform) in the future.	+ (-)	+ /Mixed	Table 5.18
H7A	Future performance of Islamic focused family (IFF) with star (poor) funds differs from conventional focused family (CFF).	+	+	Same Previous Table
H8	Fund families have the capability to maintain their star fund family status in the future.	+	+	Table 5.19