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Human Capital efficiency and equity funds' performance during the COVID-19 pandemic

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ABSTRACT

The paper investigates the impact of human capital efficiency (HCE) on equity funds' performance during three stages of the COVID-19 pandemic. We collected data for 799 open-ended equity funds across five EU countries and ranked them in five categories of HCE and compare their risk-adjusted performance across these categories. The results suggest that during the COVID-19 outbreak, the equity funds that were ranked higher in HCE outperformed their counterparts. We suggest that fund managers should invest in human capital to improve funds' coping ability and resilience during periods of extreme stress.

1. Introduction

In a rational setting, the funds with better-skilled managers should outperform their counterparts. There is a plethora of studies that focus on mutual funds performance and possible determinants of persistence. Andreu et al. (2018) attributed the market timing ability of mutual funds' managers to the fund's size. Muñoz et al. (2014) documented the role of the clientele effect towards funds' performance and suggested that funds' management is influenced by profit-seeking and value-driven investors. Andreu et al. (2019) focused on risk-seeking of mutual funds and highlighted that managers' demographics contribute towards risk profile and consequently impact the financial performance. Fang et al. (2017) believed that during recessionary periods, fund managers' skills are effected by herding behavior. Wang and Ko (2017) highlighted the importance of managers' retention for persistent performance. Berkowitz and Kotowitz (2002) suggested that sustainable returns of mutual funds emanate from the quality of funds' management, and investors are willing to pay higher fees to engage better quality fund managers. Many studies have deliberated on the positive linkages between managers' skills and mutual fund performance (e.g., Berk & van Binsbergen, 2015; Cai et al., 2018; Muñoz, 2019; Yi et al., 2018). However, there is limited evidence on the impact of Human Capital Efficiency (HCE) on equity funds' performance, and it is not clear whether this impact varies in different market conditions.

COVID-19 pandemic and its severe economic and social consequences provide unique settings to examine the effect of investment in human capital and its efficiency on the mutual funds' performance. In this paper, we explore whether mutual funds with higher human capital efficiency demonstrate higher resilience to the COVID-19 crisis shock or not. The diverse impacts of the COVID-19 pandemic on financial markets and institutions have been analyzed in the recent literature from several sets of perspectives. Zhang et al. (2020) report a substantial increase in volatility in global markets due to the outbreak of the COVID-19. Corbet et al. (2020) explore the impact of corporate identity associations with 'corona' on the stock performance before and during the pandemic. Goodell and Huynh (2020)

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assess the US industry-level market reactions to COVID-19 pandemic and COVID-related news announcements. (Yarovaya et al., 2020) analyze the response of equity, bond, precious metals, and cryptocurrency markets to the COVID-19 shock, and results demonstrate heterogeneous patterns of reaction and recovery across different asset classes and within each class of assets. Goodell and Goutte (2020) employed a wavelet coherence approach to investigate the Bitcoin reaction to the COVID-19 pandemic. The results indicate that during the peak of the pandemic, from 5th April to April 29, 2020, the levels of COVID-19 caused a rise in Bitcoin prices. A similar approach used by Sharif et al. (2020) in the analysis of the impact of the COVID-19, EPU, geopolitical index and oil price on the US stock markets in the first three months of the pandemic, from 21st January to March 30, 2020. Results show that oil shock hit the US stock markets stronger than the spread of the COVID-19 virus itself.

The economic effects originated by the COVID-19 pandemic has been explored across stock markets, commodities, and cryptocurrencies (Akhtaruzzaman et al., 2020; Corbet et al., 2020). The comprehensive overview of the COVID-19 contagion and unique characteristics of this new crisis is provided by (Yarovaya et al., 2020), while Goodell (2020) further highlights the direction for future COVID-19 research. Owing to the active investment strategies, mutual funds usually act as panic healers and fund managers are expected to produce consistent positive alphas (Huang et al., 2019). Rizvi, Mirza, Naqvi, & Rahat, 2020 reported varying mutual funds' performance during the COVID-19 outbreak in EU. They also pointed out the drift in investment styles of fund managers as a response to the evolving situation. While new evidence on the economic effects of the COVID-19 rapidly become available, to our best knowledge, this paper is the first attempt to analyze the impact of investment in human capital on the coping mechanism of the mutual funds and their resilience to the COVID-19 crisis. The investment in human capital is very strategic (Hitt, Bierman, Shimizu, & Kochhar, 2001) and contributes to value creation (Lopez-Cabrales, Valle, & Herrero, 2006). The relevance of human resources increases manifold for services (Nieves & Quintana, 2018), and mutual funds represent an essential cluster of financial services that have significant dependence on human capital. Therefore, it is crucial to assess if mutual funds' performance varies with human capital efficiency.

Thus, in this paper, we analyze the linkages between human capital efficiency and the mutual fund performance in five European economies that have been severely affected by the COVID-19 pandemic. This includes Spain, Italy, France, Germany, and Belgium, which account for 14.8% of the global cases and 28.4% of the mortality count (see Table 1 for COVID-19 statistics in these countries). Most of the early studies on the COVID-19 are focused on the US economy and impact on the US market (e.g., Goodell & Huynh, 2020; Sharif et al., 2020). In this paper, we consider the impact of investing in human capital on a sample of EU funds and assess their resilience towards the pandemic, providing novel and original contribution to the COVID-19 literature.

The results show that funds with higher human capital efficiency depicted better risk-adjusted performance and Jensen's alpha compared to their counterparts during the outbreak. This remains consistent across different stages of the COVID-19 crisis in five countries analyzed. We report that even when the pandemic reached its peak in the EU and the majority of funds demonstrated negative returns, the funds that are in the top 20% of human capital efficiency demonstrated positive (and higher) risk-adjusted returns. The findings remained robust for various performance measures as well as for abnormal returns assessment during pre-COVID and outbreak periods.

The remainder of the paper is organized as follows. Section 2 discusses the data and methodology. Section 3 presents empirical results, while Section 4 concludes.

2. Data and methodology

This paper utilizes data for 799 open-ended equity funds across five countries, Spain, Italy, France, Germany, and Belgium, from the 1st of January to the June 2, 2020. The focus of this paper is to evaluate the impact of human capital efficiency on the performance of equity funds during the COVID-19 pandemics. Pulic (2000), Pulic & Kolakovic, 2003 suggest that Human Capital Efficiency (HCE) is a function of value-added (VA) and human capital (HC) that can be expressed as:

$$HCE = \frac{VA}{HC}, \tag{1}$$

where *HC* is an investment in human capital. The *VA* for a fund is estimated as a product of CAPM based fund's alpha and asset under management (α x AUM).

Table 1
COVID-19 statistics for selected EU countries.

Country	Total Cases	Total Deaths	Death Rate[a]
World	*6408816*	*378317*	*5,90%*
Spain	286718	27127	9,46%
Italy	233197	33475	14,35%
France	189220	28833	15,24%
Germany	183898	8636	4,70%
Belgium	58615	9505	16,22%

Source: https://www.worldometers.info/.
The data is as on June 2nd, 2020
[a] Death Rate is calculated as Total Deaths/Total Cases.

Table 2
Country wise Sample Distribution (Based on HCE).

	Low	2	3	4	High	Total
Spain	21	26	20	25	26	**118**
Italy	24	22	19	33	27	**125**
France	42	42	48	42	45	**219**
Germany	52	50	54	49	47	**252**
Belgium	21	19	18	10	17	**85**
Total	**160**	**159**	**159**	**159**	**162**	**799**

We estimate HCE for each fund as of 4Q19. The necessary information related to compensation and AUM is available from financial disclosures of each fund, and we only include funds that publicly disseminates these details. The compensation consists of payroll, commissions, bonuses, allowances, training expenditures, etc. that signify various spending on human resources in a given fund. Our final sample consists of 799 equity funds across five countries. To calculate the CAPM based alpha, we use daily net asset value (NAV) going back to January 2019 (pre COVID-19 period). The individual fund alpha, along with AUM, is used to estimate VA in equation (1). The value-added and investment in human capital will get us HCE. Once HCE for each fund is estimated, we classify them in five groups (20% each) from high to low HCE. The comparative performance is assessed across these groups during the COVID-19 outbreak. We expect that funds with higher HCE should outperform their counterparts with lower HCE. Table 2 presents the country-wise distribution of these funds across five rank groups.

We analyze the impact of the COVID-19 crisis on our ranked funds' performance in several subperiods. We begin our assessment from January 1st' 2020, which is the date when COVID-19 was formally reported to WHO. Hence, our full period spans from January 1st to June 2nd' 2020. After that, we consider subperiods to analyze the performance during different stages of the COVID-19 pandemic. Stage A is specified from January 1st to February 20th' 2020, that marks a very moderate spread of the virus in the EU, i.e., an early stage of the crisis. Stage B is from February 21st to May 7th that represents the peak of the pandemics, and stage C is from May 8th to June 2nd when the curve begins to flatten. In Table 3, we present the timeline of these stages with some critical news corresponding to the evolution of the COVID-19 crisis.

There are two methodological approaches that we employ in this study for evaluating the impact of HCE on the funds' performance. The first one comprises the conventional risk-adjusted measures, while the second one is similar to an event study. These two approaches are explained below.

2.1. Risk-adjusted performance

To estimate and compare the risk-adjusted performance, we employ multiple measures. These include adjusted Sharpe (Sharpe, 1966), Treynor (Treynor & Mazuy, 1966), Sortino (Sortino & Price, 1994), and Information ratios. The adjusted Sharpe ratio is based on Sharpe (1966) and modified to by Pezier and White (2006) to account for non-normality of returns. Few modifications have been proposed for information ratio; however, Goodwin (1998) noted that the ratio in its simplest form is most useful for funds' comparison. We supplement these ratios by calculating Jenson's alpha (Jensen, 1968) using an asset pricing framework of Fama & French, 1992 and augmented by Carhart (1997). The fixed effect panel representation of this will be:

$$R_i - R_f = \alpha_i + \beta_i(R_m - R_f) + s_i SMB_t + h_i HML_t + w_i MoM_t + e_{it}, \tag{2}$$

where R_X is (n x t) vector of funds' NAV based returns in group i of HCE, R_f represents the risk-free rate, $R_m - R_f$ is the market risk premium, *SMB* represents size premium, *HML* and *MoM* respectively reflect value and momentum factors. The R_f, as well as risk premia, are of the form (1 x t). Jensen's alpha is represented by α, while β, s, h, and w are risk loadings. We use Euro 5 years' government benchmark bond yield as the risk-free rate, European SMB, HML, and MoM factors are extracted from the data library of Kenneth R French.[1] For information ratio, we use S&P Europe350[2] as the benchmark.

2.2. Event study methodology

Given the relevance of HCE, we expect that there should be a performance differential in pre Covid-19 and the outbreak periods. To evaluate this, we use a CAPM based event study methodology similar to that of Goddard et al. (2012) and Mirza et al. (2020). The mean and variance functional form of GARCH (1,1) will be as follows

$$R_{it} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \tau_i D_{it} + \phi_i h_{it} + e_{it} \quad \text{with} \quad e_i \tilde{} t_n(0, h_i) \tag{3}$$

[1] The data library is open source and accessible at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.The factors' daily data is available till April 30th' 2020. Using Kenneth French methodology, we compute these factors for the remaining period (May 1st to June 2nd). The data is translated into equivalent of Euros.

[2] The S&P Europe 350 consists of 350 leading blue-chip companies drawn from 16 developed European markets.

Table 3
Timeline of evolution of COVID-19.

Stage A	Dec 31 - Jan 01	Chinese Authorities alert WHO about pneumonia type cases
	Jan 11	First death reported
	Jan 21	Human to Human transmission of virus confirmed by WHO
	Jan 25	Primary cases in Europe - France confirms three infections
	Jan 27	Germany confirms its first case
	Jan 30	WHO declares the outbreak a public health emergency
	Feb 9	The death toll surpass that of SARS epidemic in 2002–03
	Feb 11	The official name COVID-19 is assigned to the virus
	Feb 15	France reports its first death
	Feb 20	The virus impacts 26 countries across the globe
Stage B	Feb 21	Cases of COVID-19 continue to increase in Italy
	Feb 28	WHO raises the global risk of spread of COVID-19 from "high" to "very high."
	March 7	The number of COVID-19 cases surpasses 100,000.
	March 9	COVID-19 is declared as global pandemic
	March 13	Europe is the new epicenter of disease with more cases and deaths than the rest of the world combined
	March 17	France imposes strict lockdown to combat COVID-19
	March 24	Cases of COVID-19 crosses 400000
	April 3	Asian Development Bank estimates economic impact of COVID-19 to be between $2 - $4 trillions
	April 6	The death toll in Europe crosses 50000
	April 22	WHO observes the outbreak in Europe to be stabilizing
	May 1	European Investment Bank and WHO announces partnership for the COVID-19 response
	May 4	Italy begin to lift lockdown
	May 7th	The UN increases its global response plan to $7 Billion
Stage C	May 8	EU agrees on emergency financial support to euro area countries
	May 11	France lifts lockdown to ease certain restrictions
	May 15	EU discuss priorities for recovery
	May 19	EU adopts scheme to support workers
	May 21	Total number of cases crosses 5 million globally
	May 25	Relief measures were adopted for aviation and railways in EU
	June 2	France enters second phase of post lockdown,

$$h_{it} = c_i + a_i e_{it-1}^2 + b_i h_{it-1} + \delta_i D_{it} \tag{4}$$

R_{it} is the intraday fund return, R_{mt} corresponds to the returns on S&P Europe 350, R_{ft} is the risk-free rate. We define D_{it} as the dummy variable with t = 1; if t falls during the COVID-19 outbreak (entire period as well as for each stage), h_{it} is the fund's conditional variance, and e_{it} is random error. We represent estimated parameters as α_i, β_i, φ_i, c_i, a_i, b_i, and δ_i (errors in variables). The cumulative abnormal returns (CARs) are estimated through coefficient τ_i. For this analysis, we include pre COVID-19 data from January 1st, 2019, while for COVID-19, the sample period and stages are the same as specified earlier.

3. Results and discussion

The descriptive statistics on HCE before the outbreak is presented in Table 4. In the full sample, the average values range from 0.86 (low) to 6.29 (high), representing a significant difference between the extreme categories. There are some interesting observations across the countries. In the low HCE category, Spanish equity funds have minimum efficiency (0.68). Among the high HCE classification, equity funds in Belgium are at the bottom. The funds based in Germany and France represent the best efficiency across all categories of HCE from low to high.

The results of different risk-adjusted measures are presented in Table 5. The funds with higher HCE outperform their counterparts with lower HCE for the entire period. The funds that are included in the two lowest ranks of HCE have negative risk-adjusted returns. This has been consistent when the risk is defined as total risk (Sharpe), systematic risk (Treynor), downside risk (Sortino), or tracking error (Information ratio). Our Sharpe ratio for lowest HCE funds is −0.075 (Treynor −0.04, Sortino 0.005, IR -0.0105), while for the top HCE category, it is 0.033 (Treynor 0.017, Sortino, IR 0.002). These results are mostly significant at 1% and 5% level of significance. An interesting observation is the performance of funds across the HCE ranks. As we move from lower to higher HCE, the performance of funds improve significantly. This remains robust across all metrics and indicates the relevance of HCE towards the performance of equity funds.

Table 5 also presents the results for the three stages of the COVID-19 crisis. During phase 1 of the pandemic, all funds demonstrated positive performance, which is plausible because, at that time, none of the countries in our sample were significantly impacted. The contagion was mostly contained within China and some countries in the Asia Pacific. In terms of HCE, the funds in the high category remained dominant during this period, while for the funds with low HCE, risk-adjusted returns were lower, albeit positive.

Stage 2 of our analysis presents the results for the most devastating period of COVID-19 in the EU. This was when Europe became the new epicenter of the disease, and financial systems across member states came under stress. We can observe that funds in three out of five HCE categories plunged into the negative zone. These low to medium HCE categories represent 60% of our total sample. The two classifications that have funds with high HCE continued to resist, and for these, we observe a Sharpe ratio of 0.023 and 0.0125. These

Table 4
Human capital efficiency year End 2019

		Low	2	3	4	High
Overall	Mean	0,8615	1,5044	2,7120	4,7970	6,2926
	Std Dev	*0,0329*	*0,2093*	*0,3530*	*0,4229*	*0,6746*
Spain	Mean	0,6853	1,2423	2,5708	4,9810	6,1528
	Std Dev	*0,0317*	*0,2334*	*0,2591*	*0,4984*	*0,5202*
Italy	Mean	0,8484	1,1827	2,5064	3,5690	6,4507
	Std Dev	*0,0175*	*0,2417*	*0,4081*	*0,4145*	*0,5126*
France	Mean	0,9331	1,8127	2,8932	5,3750	6,4206
	Std Dev	*0,0341*	*0,2096*	*0,4449*	*0,3718*	*0,5527*
Germany	Mean	0,9720	1,9738	2,9713	5,5191	6,3811
	Std Dev	*0,0296*	*0,1400*	*0,3870*	*0,5171*	*0,8085*
Belgium	Mean	0,8689	1,3109	2,6189	4,5420	6,0577
	Std Dev	*0,0456*	*0,2067*	*0,2043*	*0,2616*	*0,8849*

Table 5
Risk adjusted performance measures.

	Full Period							
	Sharpe Ratio		Treynor Ratio		Sortino Ratio		Information Ratio	
Low	−0,0751	***	−0,0406	***	−0,0202	***	−0,0105	***
2	−0,0320	**	−0,0165	*	−0,0076		−0,0037	*
3	0,0019	*	0,0009	*	0,0004	**	0,0002	**
4	0,0284	***	0,0103	**	0,0052	**	0,0023	**
High	0,0332	**	0,0175	**	0,0054	**	0,0022	**
Stage 1								
	Sharpe Ratio		**Treynor Ratio**		**Sortino Ratio**		**Information Ratio**	
Low	0,0065	***	0,0046	*	0,0015	**	0,0032	
2	0,0089	*	0,0060	**	0,0018	**	0,0062	**
3	0,0098	**	0,0063	*	0,0017		0,0093	***
4	0,0192	**	0,0117	**	0,0029	*	0,0154	*
High	0,0269	***	0,0197	***	0,0036	***	0,0263	*
Stage 2								
	Sharpe Ratio		**Treynor Ratio**		**Sortino Ratio**		**Information Ratio**	
Low	−0,0689	***	−0,0109	**	−0,0349	**	−0,0090	**
2	−0,0479	**	−0,0072	**	−0,0214		−0,0056	**
3	−0,0255	**	−0,0037	**	−0,0100		−0,0027	*
4	0,0125	*	0,0017	**	0,0043	**	0,0012	**
High	0,0230	***	0,0200	**	0,0070	***	0,0133	***
Stage 3								
	Sharpe Ratio		**Treynor Ratio**		**Sortino Ratio**		**Information Ratio**	
Low	−0,0255	**	−0,0160	***	−0,0042	***	−0,0092	*
2	−0,0103	*	−0,0062	**	−0,0015	**	−0,0034	**
3	0,0006		0,0003	*	0,0007		0,0002	*
4	0,0174	**	0,0094	***	0,0020		0,0046	*
High	0,0260	**	0,0134	***	0,0026	***	0,0062	***

Note: *** represents significance at 1%, ** at 5% and * at 10%.

results demonstrate the better coping ability of fund with higher HCE.

During stage 3, in the final subperiod analyzed, the curve flattened with regression in the growth of new and hospitalized cases. This enabled the states to revive the economic activity resulting in moderate improvement in the financial market. We observe this impact with modest amelioration in funds' risk-adjusted returns. The influence of HCE remained consistent, and funds that are ranked higher in terms of HCE continued to perform better on all estimates. The Sharpe and Treynor ratio for low HCE funds was −0.0255 and −0.0160, respectively, that increased to 0.0006 and 0.0003 for medium HCE funds. Finally, for high HCE funds, the estimated Sharpe and Treynor ratios are 0.026 and 0.0134. These results are clear evidence of the fact that funds earn excess returns based on human capital efficiency, and higher HCE translates into higher risk-adjusted returns.

We present results on Jensen's alpha with four factors specification in Table 6. For the entire period, we report negative alphas for low HCE funds. The excess returns are positive for funds with mid to high HCE. We observe a maximum alpha of 0.0396 in the most human capital-efficient funds, signifying that superior funds' performance is associated with human capital efficiency. The stage-wise results are similar to our findings on risk-adjusted performance with higher HCE funds dominating across the three periods. The low HCE funds showed positive alpha in stage 1 but became negative in later stages. For high HCE funds, the alpha consistently remained positive (and max) across the three periods.

Table 6
Jensen's Alpha based on Four Factor Model.

	Full Period									
	Low		2		3		4		High	
α	−0,0269	***	−0,0148	**	0,0136	**	0,0229	**	0,0396	***
β	0,7238	**	0,6695	*	0,3641	**	0,1308	*	0,2131	**
s	0,5942	**	0,6297		0,4802	*	0,4418	**	0,8938	**
h	0,1071	*	0,2255	**	0,4510		0,6682		0,2383	**
W	0,6105	**	0,5813		0,2243		0,6049	*	0,5456	**
Adj R^2	0,6260		0,3090		0,3993		0,4586		0,5437	
Stage 1										
	Low		**2**		**3**		**4**		**High**	
α	0,0054	**	0,0061	**	0,0092	*	0,0108	**	0,0187	***
β	0,1190		0,3387		0,2482	**	0,2172	*	0,0554	**
s	0,0249	**	0,1057	**	−0,0857		0,1055	*	0,0883	**
h	0,1415	*	−0,2978		0,5958	**	0,8827	*	0,3148	*
w	0,5780	**	0,5504	**	0,2124	**	0,5727	**	0,5166	*
Adj R^2	0,3841		0,3995		0,4645		0,4602		0,5811	
Stage 2										
	Low		**2**		**3**		**4**		**High**	
A	−0,0092	**	−0,0106	**	−0,0205	**	0,0020	**	0,0063	***
B	0,1295	*	0,3688	*	0,2702	*	0,2365	**	0,0603	**
S	0,0262	*	0,1111		−0,0901		0,1109	*	0,0928	*
H	0,1555	**	0,3274	*	−0,6550		−0,9705	**	0,3461	*
W	−0,6380		0,6075	*	0,2344	*	0,6321	*	0,5703	*
Adj R^2	0,4803		0,3032		0,3725		0,3723		0,4713	
Stage 3										
	Low		**2**		**3**		**4**		**High**	
A	−0,0109	**	−0,0085	**	0,0094	**	0,0173	**	0,0202	***
B	0,1023	*	0,2912	*	0,2134	*	0,1868	*	0,0476	*
S	0,0508	**	0,2156		−0,1748		0,2152	**	0,1800	**
H	0,1869	*	−0,3934		−0,7869		−1,1659		0,4158	
W	0,8270	**	0,6198	*	−0,8633		0,2688	*	0,3426	*
Adj R^2	0,4693		0,4938		0,3107		0,4058		0,5913	

*** represents significance at 1%, ** at 5% and * at 10%.

Table 7
Abnormal returns of HCE sorted funds prior to Covid-19 and during outbreak.

Fund Type	Average Cumulative Abnormal Returns using GARCH (1, 1) CAPM Specification									
	Pre Covid		**Covid Outbreak**		**Stage 1**		**Stage 2**		**Stage 3**	
Low	−0,0201%	***	−0,0403%	***	0,0014%	***	−0,0237%	***	−0,0176%	***
2	−0,0135%	***	−0,0322%	**	0,0136%	***	−0,0193%	***	−0,0135%	**
3	−0,0110%	**	−0,0104%	**	0,0175%	**	−0,0139%	**	−0,0114%	**
4	0,0205%	**	0,0215%	***	0,0192%	**	0,0128%	**	0,0160%	**
High	0,0410%	***	0,0506%	***	0,0281%	***	0,0188%	***	0,0203%	***

Results of ARCH LM Test

Category	**No of Funds**	**Estimate**	**Test Statistic**	**Prob.**
Low	160	F-statistic	10.449***	0.0001
		Obs*R-squared	9.141***	0.0001
2	159	F-statistic	5.583**	0.0002
		Obs*R-squared	5.461**	0.0190
3	159	F-statistic	5.256**	0.0195
		Obs*R-squared	5.147**	0.0199
4	159	F-statistic	6.236**	0.0112
		Obs*R-squared	6.287**	0.0115
High	162	F-statistic	7.706***	0.0027
		Obs*R-squared	7.454***	0.0029

***represent significance at 1%, ** at 5% and * at 10%.

The results for GARCH (1,1) and ARCH LM are presented in Table 7. The ARCH LM statistics indicate the incidence of ARCH effects for the estimation period and validates the choice of GARCH (1,1) (Hansen & Lunde, 2005). The CARs for the pre-COVID and entire COVID period as well as stage-wise assessment, support the relevance of HCE. During the pre-COVID period, the funds in the top two HCE categories show positive abnormal returns while all other funds have negative CARs. This trend continues during the outbreak with positive CARs for higher HCE funds. The most interesting observation here is that funds in the top HCE category demonstrate higher

CARs during the pandemic compared to the pre-COVID abnormal returns. This suggests a vital role of HCE for funds performance amidst economic turmoils. During each of the three stages, the high ranked HCE funds report superior abnormal returns compared to their counterparts with lower HCE. For stage 1, there are positive CARs for all funds, while as the health crisis deepens in stages 2 and 3, only the top two HCE categories of funds could sustain positive CARs. These findings suggest that human capital efficiency is central in shaping up a fund's performance and helps in enduring resilience in turbulent times.

4. Conclusion

The performance of mutual funds is dependent on the investment strategies employed by the portfolio managers. These managers represent the human capital of a fund, and investment in this resource contributes towards human capital efficiency. Consequently, this efficiency should translate into a performance that should vary according to the level of human capital efficiency. The COVID-19 is an unfortunate but unique opportunity to evaluate the impact of human capital efficiency (HCE) on funds' performance during a period of extreme stress. We analyze this by sorting equity funds based on their HCE and ranking them in five categories from high to low. The comparative performance is assessed across these categories. Our results suggest that during the COVID-19 outbreak, the equity funds that were ranked higher in human capital efficiency outperformed their counterparts. The analysis for different stages of the outbreak revealed some interesting findings. As the contagion peaks in the EU, most funds showed negative returns and Jensen's alpha. However, even during this stage, the funds with higher HCE continued to demonstrate resilience with significant positive risk-adjusted returns as well as Jensen's alpha. Our analysis of abnormal returns confirms the importance of HCE as funds in higher HCE category demonstrated superior abnormal returns for pre COVID-19 period as well as during the outbreak. We conclude that mutual funds should concentrate on investing in human capital as resulting efficiency leads to robust performance during periods marked with uncertainties and turmoil.

Authors statement

Larisa Yarovaya (first draft write-up, literature review, contribution, preparing manuscript for submission, final editing/formatting); Nawazish Mirza (empirical results write-up, work on second/third draft); Jamila Abaidi (data collection and filtering, empirical investigation), Amir Hasnaoui (data collection and filtering, methodology, empirical investigation).

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Further reading

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