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This is the first paper to explore which characteristics of Russian fund managers are connected with a higher abnormal return (measured by Jensen's alpha) and risk (beta) for mutual funds. While only some fund managers publish biographic sketches we use the Heckman procedure to control for self-selection issues. The results support the idea that individual characteristics indicate the possibility to earn abnormal alpha. The relationship between both fund performance measures and manager experience has inverted U-shape. The results can be used as a simple screening system that helps to choose a mutual fund to invest in without sophisticated calculations.

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1. Introduction

Investors are interested in high returns comparative to the level of risk. Mutual funds, which are becoming more and more popular in Russia, enable small investors to pool their money and invest in diversified portfolios. The problem is how to choose the fund to invest in. On the one hand, the investor can analyse the past performance of mutual funds and select funds that performed best. However this requires special knowledge and skills to process the information published by mutual funds and calculate performance indicators. Moreover past performance does not guarantee future performance.

On the other hand, investors can decide on the basis of the fund manager's characteristics. Mutual fund performance mainly depends on the manager's skills inasmuch as they determine the assets selected and the investment strategy. More competent managers have a better strategy and provide higher results even in changing conditions. Fund manager characteristics can therefore be used as signals for investors.

In this paper the authors consider fund manager characteristics from an intellectual capital (IC) point of view. This gives a more comprehensive understanding of what characteristics are beneficial for fund management. The results can be of interest to different stakeholders. Firstly, investors can choose a fund to invest in by considering the manager characteristics which positively influence fund performance. Secondly, HR managers and mutual fund owners can take into account this information when hiring fund managers. Additionally, mutual fund managers will be more interested in disclosure of their bibliographic information and distinctive features if they realize that this is valuable for investors.

Fund manager IC, for example knowledge and skills such as stock-picking and market timing, definitely affect fund performance. However the manager characteristics that investors can observe are not necessarily complete enough to reflect his/her competencies. Usually websites provide bibliographic sketches that include information only on education and experience. Moreover, it is not clear which characteristics are most related to fund performance. For example, is an economics degree the best?

Another issue raised in this paper is the investigation of fund management in Russia. In contrast with developed markets explored in previous papers, i.e. in Chevalier and Ellison (1999), Gottesman and Morey (2006), the Russian stock market and fund management services have a lot of peculiarities connected with the availability of information and the measurement of manager characteristics. While developed markets are highly efficient and mutual fund managers do not usually outperform the stock market, developing stock markets such as the Russian one are less efficient and this allows managers to demonstrate their competencies and allows us to investigate the relationship between manager characteristics and fund performance. This paper

contributes to understanding fund management on the Russian stock market and the aim of this paper is to determine which characteristics of managers are beneficial for the performance of Russian mutual funds.

The remainder of the paper is organized as follows. Section 2 considers manager characteristics from an IC perspective. Then research frameworks and the results of previous papers about the influence of manager personal qualities on fund performance and risks are reviewed. Section 3 discusses the difficulties connected with carrying out research into Russian fund management and describes the research methodology. Section 4 presents the empirical results; Section 5 describes robustness checks; and Section 6 concludes.

2. Literature review

It is well known that IC may have an impact on organizations (Sullivan, 1999; Cabrita, Vaz, 2008; Mládková, L., 2013; Seleim, Bontis, 2013). This type of analysis is called “Strategic IC Management” and it considers IC as an organizational asset comprised of human, relational and structural capital (Edvinsson, Malone, 1997) which should be developed and whose impacts are decisive to the organizations. Strategic IC Management has been extended to regions and countries (Bonfour, Edvinsson, 2005).

However, very few studies have been made of the individual dimension of IC (Mura, Longo, 2013; Tomé et al., 2014). This fact is somehow surprising given that individuals are the essential agents of IC operations and the main constituents of organizations. The explanation for this fact may be that studies on IC are funded by sponsors who are mostly organizations or public bodies with a national scope rather than unions or individuals.

Table 1 explains the difference between the three levels (national, organizational and personal) analysis (Tomé, Naidenova and Oskolkova, 2014, p. 191).

Tab. 1. IC on different levels of analysis

	Macro-level	Meso-level	Micro-level
Main actors	Regions or countries	Companies	Individuals
Human Capital	Labour force and its knowledge	Competences as source of productivity, quality of work, loyalty	Competences
Relational Capital	Diplomatic relations	Brand, image, relationships with external stakeholders	Image and networks
Structural Capital	Infrastructure, governability, databases, etc.	Routines, codified organizational knowledge	Individual intellectual property

While individual IC has a strong impact on personal performance, the authors analyse a narrower area: the influence of individual IC on mutual fund manager performance and fund risk. A mutual fund is an investment vehicle that is made up of a pool of funds collected from many investors for the purpose of investing in securities. The main advantage of mutual funds is that they give small investors access to professionally managed portfolios. Mutual funds are financial assets where managers' skills play an important role in their performance. Returns depend on the skills of its managers, yet it is difficult to find other factors which also imply performance—this is the feature of the industry.

Despite the fact that managers' personal qualities are crucial for mutual fund performance only a few papers explore that relationship, and the majority of them concentrate on the American market. The seminal research of Golec (1996) tries to explain risk-adjusted fund return, risk and fee by manager characteristics using a sample of 530 American funds. The papers of Chevalier and Ellison (1999), Gottesman and Morey (2006), Switzer and Huang (2007), Karagiannidis (2012) also use the same database of American funds (Morningstar Inc.) however they explore different time periods. They also implement different empirical methods, from OLS (Chevalier, Ellison, 1999; Karagiannidis, 2012) to 3SLS (Golec, 1996; Switzer, Huang, 2007) and the Heckman correction procedure (Chevalier, Ellison, 1999). Nonetheless they produce similar results and prove the importance of fund managers' personal qualities. Fund performance is usually negatively connected with manager age (Golec, 1996; Chevalier, Ellison, 1999) and positively connected with MBA education (Chevalier, Ellison, 1999; Gottesman, Morey, 2006; Golec, 1996; Switzer, Huang, 2007), the quality of managers' undergraduate program (Chevalier, Ellison, 1999; Gottesman, Morey, 2006), tenure (Golec, 1996; Karagiannidis, 2012) and CFA certificates (Switzer, Huang, 2007).

Previous papers explore also the influence of personal qualities on fund risks. As a measure of risk researchers usually use the beta coefficient which reflects systematic risk (Golec, 1996; Chevalier, Ellison, 1999; Switzer, Huang, 2007; Karagiannidis, 2012) or the standard deviation of returns which reflects total risk of a fund (Golec, 1996; Karagiannidis, 2012). Chevalier and Ellison (1999) and Golec (1996) find a positive relationship between average SAT (Scholastic Aptitude Test) scores of managers' undergraduate program and beta, and between age and beta. They also suggest the explanation for higher fund returns of MBAs is that they take more systematic risk. However Gottesman and Morey (2006) find little evidence of a relationship between beta and the quality of managers' education and their degrees (CFA, MBA, PhD). They explain their finding by the differences in analysed time periods: while Chevalier and Ellison explore a bull market, they concentrate on a bear market. Further research reveals

other significant factors like gender (women choose riskier strategies) or experience (the higher the experience, the bigger the beta coefficient) (Switzer, Huang, 2007).

Li, Zhang, and Zhao (2001) discuss that the more talented and more devoted to their job managers are, the more likely they are to have better performance. They use 2 groups of characteristics: (1) intelligence and education (the composite SAT score); and (2) work experience and career (the total number of years of working, the number of years of working at the specific hedge fund, and the manager's age). They found that better-educated managers achieve higher returns with lower risk exposure.

However these papers consider fund manager characteristics only as a set of available variables and do not discuss them in detail. In the framework of IC, human capital is treated as knowledge which belongs to employees, for example skills, abilities, and experience (Stewart, 1997; Lee, 2011). These characteristics can be treated as IC. Papers on IC, especially on human capital, consider which features of the work force are important for company success. It explains why individual characteristics could significantly influence fund performance. One of the few studies that discuss personal qualities as human capital indicators is Switzer and Huang (2007). However they analyse only small and mid-capitalised funds.

The majority of empirical papers on IC are focused on firm level. Even if they are based on questionnaires of individual employees, this data is aggregated or averaged over companies (Bontis, 1998). An analysis of general performance of a firm results in a loss of factors and it is impossible to distinguish the contribution of particular employees. But in some cases such as a sports club (Tome et al., 2014) or a fund management company the contribution of a coach/manager can be identified. There are different classifications of IC on an individual level. Hudson considers human capital on an individual level as the combination of genetic inheritance, education, experience; and attitudes about life and business (Hudson, 1993). Tome, Naidenova and Oskolkova (2014) suggest dividing individual IC into the same three main components as that of a firm or country—structural, relational, and human. However generally authors investigate the role of a manager's education and experience, but pay no attention to his/her genetic inheritance, attitude to life and business or relationships with influential people and organizations (relational capital) because of data availability. Therefore an IC framework detects possible extensions of the investigation of the relationship between the fund manager's characteristics and the fund's performance.

The majority of studies are dedicated to developed markets, therefore it is interesting to analyse the influence of managers' personal qualities on fund performance in developing markets, here in the Russian market. The results are likely to be different because the Russian market is less efficient and liquid than developed markets, highly dependent on oil prices and the

political situation, and characterized by a large number of noise traders⁶. Therefore Russian funds managers are likely to have qualities which help them to make effective investment decisions. Moreover, currently Russian funds managers are very heterogeneous in skills and education compared to European and US ones. A significant proportion of fund managers do not have an economic education and use their technical knowledge and/or self-education. The Russian stock market is less effective in terms of effective markets hypothesis (EMH) so a stronger influence from fund manager characteristics on fund performance is expected. The other reason to explore the Russian market is the features of a Russian education which are discussed below.

3. Research methodology

The literature review shows that the most common factors used by researchers to explain mutual fund manager performance are age, education, tenure and CFA certificates. While the majority of these factors are common for Russian and foreign funds, there are some differences in educational systems. European and American universities select students by scores on standardized national exams such as the SAT or GMAT. The Russian standardized national exam has been in use only since 2009. That is why it is impossible to use some average scores of standardized national exams to evaluate the quality of education. Another unique feature is that Russia introduced the 2-level system of higher education (4 years for a bachelor degree and then 2 years for a master's degree according to the Bologna process) only at the end of 2007. However some universities still have a 5 or 6 year 1-level program for "specialists". It is difficult to compare specialists with masters and bachelors because of the different length of their education. Therefore it is necessary to introduce some special indicators for education.

Three indicators of education are used: whether a manager has technical education, economic education, and whether the education was in Moscow. As "education" the authors regard the highest level of education that the manager has completed. The majority of managers have a "specialist" degree because bachelor and master have only been introduced recently. People with technical education usually have higher levels of maths. Managers with economic education have special knowledge such as technical and fundamental analysis which helps them to manage funds. Moscow universities are regarded by Russians as providing a higher quality of education than other Russian universities, therefore they attract better students. An individual manager may have both a technical and an economic education. Each of the three indicators is measured by a dummy variable.

⁶ The authors regard "noise traders" as investors that make their decisions without use of fundamental data or analysis

While the authors believe that age, MBA degree and gender influence a manager's decisions, it is impossible to evaluate impact of these for Russian funds. Manager profiles do not contain any information about age. Chevalier and Ellison (1999) also faced the same problem and suggested using an approximate age variable assuming that "each manager was 21 years old upon graduation from college" (Chevalier, Ellison, 1999). However, in Russia managers do not always report the year of graduation. Therefore the authors chose to omit the variable "age" in order to keep a satisfactory sample size. For gender, Russian funds are usually managed by men and so the variable "gender" does not have enough variation to warrant inclusion. The same situation is observed for MBAs—few managers have it.

The current paper uses the following indicators of manager personal qualities:

- Education:
 - Technical education
 - Economic education
 - Education in Moscow
- CFA certificates
- Experience in fund management.

There are different ways to estimate mutual fund performance. A common efficiency indicator is the Sharpe ratio (Sharpe, 1966). There are some other similar indicators, for example, the Sortino ratio (Sortino, van der Meer, 1991), and the Treynor ratio (Treynor, 1965).

There are other indicators which divide managers' abilities in picking and timing. Kosowski et al. (2006) show that such an approach makes it possible to distinguish random from non-random results. Most papers examine the stock-picking part of managers' abilities (Carhart, 1997, Kosowski et al, 2006, Fama, French, 2010). Some papers find that active managers fail to outperform passive benchmark portfolios even before expenses (Jensen 1968; Gruber, 1996; Carhart, 1997); others find that active managers have some stock-picking skills (Grinblatt and Titman 1989, 1992; Grinblatt, Titman, and Wermers 1995; Daniel et al. 1997; Wermers, 1997).

One of the most common indicators of stock-picking abilities is Jensen's alpha (Jensen, 1968). Alpha is still widely used to evaluate mutual fund and portfolio manager performance, often in conjunction with the Sharpe ratio. This is a risk-adjusted performance measure that represents the average return on a portfolio over and above that predicted by the capital asset pricing model (CAPM). If only excess market returns are considered, the CAPM alpha is obtained. If the Fama-French factors are added, the 3-factor alpha will be obtained. If momentum is also added, Carharts's alpha will be obtained and so on. Jensen's alpha is easy to calculate and

harder to manipulate. For those reasons and because of its popularity among both practitioners and researchers, Jensen's alpha was chosen for the current research.

Jensen's alpha is calculated as:

$$\alpha = (r - r_f) - \beta_p (r_m - r_f), \quad (1)$$

where r_m is a return of market portfolio, r_f is a risk-free rate and r is the return of mutual fund's portfolio. This equation can be re-written as:

$$r - r_f = \alpha + \beta_p (r_m - r_f) \quad (2).$$

This shows that alpha can be estimated as a constant in the regression equation of the funds' excess return on the market excess return. A daily interval was chosen to provide enough data for proper statistical estimation and inference.

The MSCI Russia was chosen as a proxy for the market portfolio, because other Russian indices (RTSI or MICEX) do not take into account dividend return which is relatively high for some Russian stocks. Returns on short-term zero-coupon Russian Government Treasury Bills (GKO), were chosen for the risk-free rate. GKO are issued by the Russian Finance Ministry and traded on the Moscow Inter Bank Currency Exchange (MICEX) and five other currency exchanges connected with MICEX, located in large regional cities.

Information about personal managerial qualities was collected from investfunds.ru. Investfunds.ru is a project of the information agency Cbonds. This web site provides the most comprehensive, up-to-date information about the Russian mutual fund industry. The data on fund managers' educational and professional characteristics were obtained from brief bibliographic sketches on Investfunds.ru. The publication of manager's bibliographic sketches is not obligatory so the information is available only for some of managers.

In Russia there are 223 equity funds and 41 bond funds. Due to the small number of bond funds the authors have focused the analysis on equity funds. Funds whose managers do not provide bibliographic information were excluded. The final sample consists of 81 equity funds. Alpha and beta are calculated using CAPM model as described above. Mutual fund size is measured as net assets under management in rubles. Financial data, except for fund size, is collected at the end of 2013. Fund size was collected at the beginning of 2013 in order to avoid possible endogeneity between end of year fund size and fund portfolio return during the year. In the regression analysis the funds' sizes are measured in logarithms.

Tab. 2. Summary statistics of funds and manager characteristics

Indicator	Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
<i>Block 1. Sample</i>						
Jensen's alpha	jensen_s_alpha	81	-0.017	0.004	-0.029	-0.009
CAPM beta	Beta	81	0.701	0.080	0.520	0.845
Technical education (dummy)	tech_edu	81	0.432	0.498	0.000	1.000
Economic education (dummy)	econom_edu	81	0.802	0.401	0.000	1.000
Education in Moscow (dummy)	edu_in_moscow	81	0.691	0.465	0.000	1.000
Presence of certificates (dummy)	certificates	81	0.346	0.479	0.000	1.000
Experience, years	experience	81	11.858	4.534	0.500	22.000
Natural logarithm of size	lsize	81	18.383	1.812	13.664	22.334
Jensen's alpha in previous year	jensen_s_alpha_2012	81	-0.020	0.007	-0.035	0.003
CAPM beta in previous year	beta_2012	81	0.658	0.119	0.402	0.970
Natural logarithm of size in previous year	lsize_2012	81	18.548	1.683	14.159	22.546
<i>Block 2. General population</i>						
Jensen's alpha	jensen_s_alpha	205	-0.017	0.007	-0.045	0.003
CAPM beta	Beta	205	0.704	0.141	0.070	1.382
Natural logarithm of size	lsize	205	17.684	1.999	9.624	23.204
Jensen's alpha in previous year	jensen_s_alpha_2012	193	-0.019	0.009	-0.045	0.036
CAPM beta in previous year	beta_2012	199	0.662	0.214	-0.536	1.793
Natural logarithm of size in previous year	lsize_2012	175	17.828	1.879	10.033	22.546

Table 2 presents a summary of the statistics for the main variables in two blocks. The first block describes variables in the final sample—both fund performance indicators and manager characteristics in 2013 and 2012. The second block shows descriptive statistics for all equity funds in Russia. There is information about managers for less than a half the funds. Also, all funds which published information about managers have a negative Jensen's alpha in 2013 whereas some funds in Russia have positive alpha in that year. However the data show that 2013 was unsuccessful for equity funds and their alphas were negative on average. Moreover the

majority of mutual funds had negative alphas in 2012 too. Nevertheless some funds included in the sample had positive alpha in 2012. Therefore the fact that all of them have a negative Jensen's alpha in 2013 could be occasional. The descriptive statistics of the general population and the sample are very close.

There could be some bias in the results because the sample includes only funds with a negative alpha. There could also be some reasons why managers are willing to publish information. Fund betas vary greatly from approximately zero to nearly one. So the sample includes portfolios with both high and low exposure to market risk.

To avoid potential multicollinearity, a correlation matrix (Tab. 3) was analysed. The highest correlation between independent variables is -0.54. It is close to maximal correlation in related papers 0.49 in Gottesman and Morey (2006) and 0.475 in Switzer and Huang (2007). In the discussion of the multicollinearity problem in regression analysis Farrar and Glauber (1967) note that an admittedly arbitrary rule of thumb is established to constrain simple correlations between explanatory variables to 0.8 or 0.9.

Tab. 3. Correlation matrix

	jensen_s_alpha	beta	econom_edu	tech_edu	edu_in_moscow	certificates	experience	lsize
jensen_s_alpha	1							
beta	0.7978*	1						
econom_edu	-0.0263	-0.0415	1					
tech_edu	0.0343	-0.0453	-0.5430*	1				
edu_in_moscow	0.1950	0.0949	-0.2784*	0.0831	1			
certificates	0.0217	0.0421	0.3504*	-0.1575	0.2249*	1		
experience	-0.1389	-0.2017	-0.0298	0.3833*	0.0491	0.0356	1	
lsize	-0.1315	-0.0264	0.0567	-0.201	0.0619	0.0875	-0.0483	1

note: * p<0.05

Table 3 provides the Pearson correlation of indicators. There is a significant correlation between alpha and beta, which shows the dependence between systematic risk and average return on a portfolio over and above that predicted by the CAPM. However, we use these indicators as the dependent variables, so there is no problem with this correlation. All other significant correlation coefficients are relatively small in terms of multicollinearity, so they can be included in the regression.

The majority of Russian fund managers were educated in Moscow, have an economics degree and about half of the managers have a technical one. Fund managers in the data have experience in investment management ranging from 6 months to 22 years. One third of the managers have certificates that enable them to work on foreign stock exchanges.

As mentioned, a regression framework is used to estimate each fund's alpha and beta. A second set of regressions is estimated to test if there is any influence between the indicators of intellectual capital, and the alphas and betas. The following equations represent these second stage regressions:

$$fund_alpha_i = \beta_1 + \beta_2 \cdot econom_edu_i + \beta_3 \cdot tech_edu_i + \beta_4 \cdot moscow_edu_i + \beta_5 \cdot certificat es_i + \beta_6 \cdot experience_i + \beta_7 \cdot experience^2_i + \beta_8 \cdot \log(size)_i + \varepsilon_i \quad (3)$$

$$fund_beta_i = \beta_1 + \beta_2 \cdot econom_edu_i + \beta_3 \cdot tech_edu_i + \beta_4 \cdot moscow_edu_i + \beta_5 \cdot certificat es_i + \beta_6 \cdot experience_i + \beta_7 \cdot experience^2_i + \beta_8 \cdot \log(size)_i + \varepsilon_i \quad (4)$$

One of the main assumptions of the OLS regression technique is the exogeneity restriction $E(\alpha_i|\varepsilon_i)=0$. However the indicators used in this paper do not suppose any kind of mutual interdependence between alphas and manager characteristics. The only variable which could be endogenous is the log of size of the fund. For that reason, the size at the beginning of the year is used.

Standard asymptotic inference is incorrect because the distribution of the variables is highly non-normal. To deal with this problem the bootstrap procedure is applied to calculate standard errors. To test the significance of the whole model, the F-statistic is used for asymptotic inference and χ^2 for the bootstrap case.

4. Empirical results

Table 4 shows the results of the regression analysis. First of all the authors analyse how manager characteristics affect the fund's risk-adjusted returns (2nd and 3rd columns of the Table 3). Fund size — the logarithm of fund's net assets — is used as a control variable. It is also assumed that the experience of a manager can have a non-linear influence on fund performance. Therefore squared experience has been included in the models. We interpret regression results at a 15% significance level, because of small number of observation as do, for example, (Kim and Wei 2002), (Amable and Verspagen 1995), and (Bloom and Van Reenen 2002). A small sample implies less assurance; the confidence intervals are “wider” in such a case.

Funds managed by people that have an economic or a technical degree or have been educated in Moscow perform better. Economic education and education in Moscow have approximately the same effect on a fund's alpha. Technical education has a smaller but still positive effect on fund's performance. Certificates that document a manager's opportunity to

work on foreign stock exchanges do not influence a fund's performance. One explanation for this finding is that the skills necessary for foreign exchanges are not suitable for working on Russian stock exchanges.

Long experience managing funds is not beneficial to fund performance. Presumably, long experience in the sphere of investment management is connected with a long period since their education was completed and suggests out-of-date knowledge. Experience from the very early period may be less relevant, or even irrelevant to how the market now operates. However nor is the absence of experience optimal. Using coefficients from the regression with squared experience, the years of experience at which the impact of experience on fund returns is maximized at 9.34 years. The adjusted coefficient of determination shows that the square of experience adds significant information.

Tab. 4. Manager characteristics and fund performance

	Alpha	Alpha	Beta	Beta
econom_edu	0.003* (0.002)	0.005*** (0.002)	0.000 (0.058)	0.087** (0.046)
tech_edu	0.002** (0.001)	0.003*** (0.001)	0.004 (0.036)	0.033 (0.028)
edu_in_moscow	0.003*** (0.001)	0.005*** (0.002)	0.034 (0.030)	0.092*** (0.029)
certificates	-0.001 (0.001)	-0.002 (0.002)	0.011 (0.035)	-0.029 (0.028)
experience	-0.000** (0.000)	0.001 (0.001)	-0.007** (0.003)	0.033* (0.022)
experience2		-0.000* (0.000)		-0.002** (0.001)
Lsize	-0.000 (0.000)	-0.000** (0.000)	-0.014** (0.008)	-0.016*** (0.007)
Constant	-0.013*** (0.006)	-0.021*** (0.008)	0.993*** (0.209)	0.731*** (0.175)
r2	0.138	0.196	0.133	0.239
N	81	81	81	81
chi2	11.778	13.839	16.521	18.492
F				
Prob ($\beta_6 = \beta_7 = 0$) > chi2		0.027		0.023

note: *** p<0.05. ** p<0.1. * p<0.15, bootstrap s.e.

The results here indicate that a large fund does not seem effective for management. The more net assets under management a fund has, the smaller alpha is.

Additionally, the authors have analysed the influence of manager characteristics on the sensitivity of fund returns to market returns, that is, on the beta coefficient (4th and 5th columns of the Table 4). An economic degree and being educated in Moscow lead to higher exposure to market risk. Possibly people with these variants of education use more or less the same strategies

fund management or prefer to follow the stock market. On the contrary, if a fund manager has technical education it does not lead to a higher beta coefficient. Opportunity to work on foreign exchanges does not have any effect on beta. The relationship between manager experience and beta coefficient is also non-linear and is an inverted U-shape. The maximum influence of manager's experience on fund beta is inherent to funds managed by people with 10.11 year experience. So the impact of experience on alpha and beta are both maximized at about 9 to 10 years experience.

We presented two different model specifications for both alpha and beta because the estimates are slightly different. Firstly, when experience squared is included the linear influence of the experience is not significant. Probably, the reason is that quadratic dependence better describes the relationship between mutual fund performance and manager experience. However the linear approximation of the relationship is also significant because of the small sample. Education variables are significant in models with experience squared. Fund manager education is closely related to their experience perhaps because of an increase in the role of economic education in more recent years. The low correlation between education variables and experience can be explained by the binary nature of the education indicators. Estimation results evidence that this relationship is also non-linear.

Larger funds have both lower alpha and beta. In other words larger funds have lower returns.

Additionally, the hypothesis that the coefficients on experience and experience squared are jointly zero has been tested (the last row in Table 2). In all cases the hypothesis can be rejected at the 5% level. It confirms that the relationship between manager experience and fund alpha and beta is U-shaped.

5. Robustness check: self-selection issues

Even if sample characteristics are close to the general population's, different biases may occur. The sample used consists of 81 funds while the general population consists of 205 funds. Therefore it is necessary to discuss whether the data used might lead to biased estimates.

While a number of papers have noted the problem of the survivorship bias in estimates of mutual fund performance (e.g. Chevalier, Ellison, 1999) the current paper does not face it, as the survivorship bias arises because the current databases usually do not contain the information about those funds that were liquidated or merged with the other funds in previous years. Therefore the results are based only on the analysis of the more successful funds and biased upward. The current paper uses only cross-sectional data that restricts the analysis but helps to

avoid survivorship bias. However there is another issue: self-selection bias. It arises because the disclosure of managers' personal information is voluntary and only 81 funds disclose the information about their managers.

To check whether self-selection issues bias the results described above, the Heckman correction procedure can be used. The authors assume that the probability of publishing a manager's bibliographic sketch depends on the fund's performance in the previous year — Jensen's alpha and the value of net assets in logarithms. In other words managers of successful funds are more interested and more motivated to disclose personal information. While there are some other possible explanations of personal information disclosure (e.g. the manager's personal qualities) they are unavailable in open access.

The Heckman correction includes an additional intermediate stage where the probit specification is estimated. Then the transformed predicted probabilities are incorporated into equations 3 and 4 as an additional explanatory variable.

The whole model is the following:

$$\begin{cases} dep_var_{it} = \beta_1 + \beta_2 \cdot econom_edu_{it} + \beta_3 \cdot tech_edu_{it} + \beta_4 \cdot moscow_edu_{it} + \\ \beta_5 \cdot certificat es_{it} + \beta_6 \cdot experience_{it} + \beta_7 \cdot experience^2_{it} + \beta_8 \cdot \log(size)_{it} + \lambda + \varepsilon \\ publish_{it} = \gamma_1 + \gamma_2 \cdot fund_alpha_{i,t-1} + \gamma_3 \cdot \log(size)_{i,t-1} + e \end{cases} \quad (5)$$

where *dep_var* is a fund's alpha (*fund_alpha*) or beta (*fund_beta*); λ represents Heckman's lambda; *publish* is a dummy variable which is equal to one if at least one of manager's characteristics is published and zero otherwise.

Table 5 describes the results of the estimation of the probability of information about fund's managers and their skills being published. Larger funds tend to publish information about managers. It allows us to identify one possible reason for the self-selection bias. However the results do not confirm the assumption that funds with better performance in the past more likely disclose personal information.

Tab. 5. Determinants of publishing manager's characteristics (probit estimation)

	Probability to publish information
jensen_s_alpha_2012	-13.563 (15.690)
lsize_2012	0.349* (0.071)
Constant	-6.523* (1.381)
Pseudo R2	0.131
Prob > chi2	0.000
Log likelihood	-99.350

Table 6 shows the results of the estimation corrected for any possible self-selection bias. Heckman's lambda shows that there is no selection bias. The results for Jensen's alpha is approximately the same as in Table 3. The only change is that the control variable — the logarithm of fund's size — becomes insignificant in regressions with experience squared.

Tab. 6. Managers' characteristics and fund performance (corrected for selection)

	Alpha (with bootstrap s.e.)	Alpha (with bootstrap s.e.)	Beta (with bootstrap s.e.)	Beta (with bootstrap s.e.)
econom_edu	0.003 (0.002)	0.005* (0.002)	0.042 (0.044)	0.090** (0.050)
tech_edu	0.002*** (0.002)	0.003* (0.001)	0.031 (0.024)	0.046* (0.021)
edu_in_moscow	0.003* (0.001)	0.005* (0.002)	0.055* (0.024)	0.088* (0.031)
Certificates	-0.001 (0.002)	-0.002 (0.002)	-0.013 (0.031)	-0.034 (0.032)
Experience	-0.000* (0.000)	0.001 (0.001)	-0.004*** (0.002)	0.019*** (0.013)
experience2		-0.000** (0.000)		-0.001** (0.001)
Lsize	-0.000 (0.001)	-0.000 (0.001)	-0.018 (0.028)	-0.020 (0.025)
Constant	-0.011 (0.025)	-0.019 (0.027)	1.050*** (0.642)	0.900*** (0.612)
Lambda	-0.001 (0.006)	-0.000 (0.007)	-0.068 (0.172)	-0.066 (0.157)
N	165	165	165	165
Wald chi2	9.183	18.806	13.382	14.897

note: * p<0.05, ** p<0.1, *** p<0.15

Conversely some coefficients in the beta regressions become significant. Technical education has a positive influence in the model with experience squared. Both models confirm the positive impact of education in Moscow on beta. Experience and experience squared have significant positive coefficients in both models with beta as a dependent variable and in estimates without correction.

The correction for selection bias does not change the results significantly. The estimation of the models with the Heckman correction confirms that manager characteristics effect alpha and beta.

6. Conclusion and discussion

The results of this research support the idea that the individual characteristics reflect mutual fund managers' intellectual capital which helps to earn abnormal alpha. A technical education has a smaller effect than the economic education, although technical education in Russia is considered better due to its longer tradition. This may be also explained by the relatively low efficiency of the Russian stock market: a mathematical background is not necessary for outperforming the market. Extensive experience is not beneficial to fund performance, the influence of experience on fund's performance reach its highest level at 9 years. This is close to the results for fund risk: managers with 10.11 year experience take the most risk.

This study supports the findings of previous research concerning the importance of fund managers' personal qualities (Chevalier, Ellison, 1999; Karagiannidis, 2012; Golec, 1996; Switzer, Huang, 2007). Fund performance in Russia is negatively connected with manager experience, which supports the results of (Golec, 1996; Chevalier, Ellison, 1999) and positively connected with education, which supports the results of (Chevalier, Ellison, 1999; Gottesman, Morey, 2006; Golec, 1996; Switzer, Huang, 2007). In contrast to Gottesman and Morey (2006) we find that there is a significant relationship between beta and the quality of manager education. A robustness check for a self-selection bias does not change the results significantly. The estimations of the models with the Heckman correction confirm that manager characteristics do affect alpha and beta.

This paper also contributes to the field of IC. While the influence of the IC of companies on their results is well-studied, the impact of individual IC on personal performance requires further study. Generally the performance of a firm is the result of many factors and it is impossible to distinguish the contribution of a particular employee. But in the case of fund management the contribution of a single manager can be identified. The current research shows that individual human capital allows fund managers to outperform the market. The theory of IC helps to explain why the personal characteristics of managers can influence fund performance. The future development of IC research can be connected with the verification of the authors belief that individual IC is more persistent over time compared to past fund performance.

The authors also propose using individual IC as a screening system for the investor who is deciding on mutual fund. The investor can use the results of the paper to select a mutual fund without complicated calculations. This is important for Russia because of investor's relatively low familiarity with stock market.

The results of this paper may be useful for HR departments of mutual funds for hiring fund managers. While HR departments have information about managers' qualification, this paper shows which characteristics better reflect their intellectual capital, and their ability to earn abnormal alpha.

The limitations and shortcomings of the study should be enumerated. The investigation can be improved by including more variables which influence the disclosure of managers' personal information, for example, by conducting surveys. The second limitation is the cross-sectional design. It would be useful to study the dynamic dependence between fund performance and manager characteristics.

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