

Organizational Architecture and Decision-Making

A complementary approach to measuring performance of portfolio managers.

Jean Moussavou

In increasingly complex financial markets that are particularly risky for the novice investor, investors both individual and institutional have turned to professional portfolio managers. An entire industry has developed to measure performance in order to help investors choose from the many investment vehicles available. There is plenty of research relating to performance measurement, but there are few studies that attempt to integrate phenomena upstream. And if numerous researchers propose tools intended to make optimum investment choices—where the optimum corresponds to maximizing wealth for the investor—very rarely do models include elements that would explain the organizational context in which decisions are made (see Charreaux and Desbrières [2004]).

I examine the impact of the organizational architecture of investment management companies (IMC) on the decision-making performance of managers under their trusteeship. By organizational architecture I mean the entire set of procedures and rules that govern the operation of an organization (see Smith [2001] and Brickley, Smith, and Zimmerman [2004]).

Analyzing managers' decisions from this perspective can be justified inasmuch as these decisions are often guided by multiple considerations that depend on the organizational context in which investment choices are made. Therefore, all else equal, IMCs with an optimum organizational architecture should achieve better financial performance than their competitors. The funds managed by portfolio managers operating in these companies should perform better than other funds.

This hypothesis is contrary to the theory of financial market efficiency, which specifies implicitly that no portfolio manager (and therefore no management company)

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can over time outperform the market (see Fama [1970]). In fact, the conclusions that may be drawn from efficient markets theory seem to imply *a priori* that the presence of any sort of superior player is of little effect. Yet professional portfolio managers prosper, despite their theoretical uselessness.

We therefore have two realities that at the very least contradict each other: the conclusions of the efficient markets theory, and the operation of professional portfolio managers in financial markets.

One of my objectives is to try to explain this paradox. Therefore, if financial markets are efficient, our investigations should prove there is no relationship between the characteristics of organizational architecture and performance. If the opposite is true, we can accept that such information would take a certain amount of time to be understood by the market and to have an effect on the price of securities. In this respect, *portfolio managers with powerful information search and processing resources would be in a privileged position*, and would profit from temporary periods of market inefficiency (see Gallais-Hamonno and Grandin [1999]).

This study depends on two sources. The first represents around 15 exploratory interviews with IMC managers and a questionnaire sent to 59 French IMCs. This procedure was used to identify, measure, and collect organizational data from various IMCs in the study. Second, I collected quantitative data relating to French investment funds (SICAV—unit trusts—and FCP—mutual funds) from the IMCs that responded to the questionnaire.

The quantitative data collected are used to measure fund performance, applying the usual financial performance measuring methods. Performance measurement separates the yield factor that can be attributed to management from factors due to market fluctuations and portfolio risk. My conclusions depend on a combination of data gathered from the interviews and the questionnaire on the one hand, and the net asset values of the French investment funds on the other.¹

VARIABLES IN THE MODEL

The analytical model is based on four groups of variables that are likely to represent the IMC organization and its relationship with the performance of the portfolio managers. Each group of variables results from the aggregation of several measurement variables. Two groups of variables concerning *formal organizational behavior* and the *behavior of interaction* between or among players are based on the well-known formal organization/informal organization dialectic.

These two groups of variables will enable us to verify the positive or negative impact of the organization of the IMC on manager performance.

The addition of a third group of variables, the *contextual variables*, upstream from *formal organizational behavior* and *behavior of interaction* between players variables, will enable us to look at the effect of contextual factors on the two types of organizational behavior. A final variable relates to the *performance of managed funds* (risk–return pair).

Formal Structural Behavior Variables

The formal structural behavior variables integrate all the measures instituted by investment company managers to structure the manager behavior area. The very nature of the financial mission of an IMC, based as it is on the handling of large sums of money, fully justifies application of a strict framework of control. The implications are particularly important. Indeed, history has shown us how well a poorly supervised manager is able to conceal losses.²

IMCs must provide proof that everything has been done to ensure investors' fund security before management authorization is granted. IMC managers are therefore inclined to develop a highly formalized internal information strategy that extends to all company processes. Consequently, and to varying degrees, portfolio managers in IMCs often see their role as constrained by a region of rules (choice of risk–return pairs; investment periods; choice of reference portfolios to which management policies are added; particular constraints assigned to management, for example).

To formalize this group of variables, I rely on work carried out by the Aston group, which, despite its age, remains the reference model today (see Pugh et al. [1963]). Kalika [1995], on the organizational structures of French firms, also constitutes an essential reference guide. I use six of the various possible characteristics of an organization.

- *Degree of structurization*, which describes the “weight” of the decision-making structure. That is, it is possible within IMCs to distinguish large entities, whose management processes may seem much more complex than those in small entities, where the structures are less rigid. The degree of structurization is expressed in the degree of *horizontal* or *functional specialization* (“width” of the organization chart), which indicates the number of departments, and in the degree of *vertical specialization* (or “height” of the organization chart) which measures the number of hierarchical levels, i.e., the length of the chain of command.

- *Degrees of standardization and formalization* are used to evaluate, respectively, the extent of written and unwritten rules or standards that are imposed on members of the organization and are used to define the limits of their actions.
- *Degree of control*, which is often analyzed in conjunction with the strategic planning concept. Indeed, there can be no control without prior planning, and plans lose all their effectiveness if there is no monitoring, i.e., control. Thus, according to Mintzberg [1979], we can distinguish between two types of planning and control systems: the 'performance control' system, which is general in nature and is interested in the results of actions, and 'action planning,' which comes into play before the event. For this work, I analyze only the control of the performance of portfolio managers, notably via the frequency of these controls.
- *Degree of consultation*, characterized by the number of decision-making collegial groups (e.g., investment committees, management committees). These collegial entities often bring together the "powers behind the throne" of the IMC. Here the main orientations for the asset allocation to which the managers should conform are often adopted formally. The introduction of this variable thus enables us to evaluate the degree of integration of the portfolio managers into the investment policies of the IMC.
- Finally, *the type of leadership* practiced in the different consulting bodies is used to take account of how much the portfolio managers are associated with, or dissociated from, definition of the main IMC strategic orientations. It is in effect within the different consulting bodies that portfolio managers can express their points of view in relation to the hierarchy. The situation may be different from one IMC to another. One will adopt a bottom-up and participative style, while another more of a top-down or directive style. Others still will grant complete autonomy to their portfolio managers. This may be the case for small management companies.

Interaction Variables Between or Among Players

Empirical observation shows that within IMCs the players, notably the portfolio managers, typically interact with all economic sectors, meaning they face many sources

of constant uncertainty. To deal with this, membership in a network of partners often strengthens the managers who can mobilize this resource. In the course of managers' daily activities, there are numerous permanent exchanges of information, forecasts, or points of view on market conditions that constantly play into individual decisions. Most often these relationships are a precious source for interpretation of information on the evolution of markets that are becoming increasingly international.

These relationships often take the form of formal contacts in the different collegial decision-making institutions present in most IMCs (investment committees, management committees, strategy committees) where investment strategies are often developed. They are also found in spontaneous exchanges between or among colleagues or players—internal or external—in the organization.

Unlike the formal structural behavior variables, which are essentially inspired by concepts in earlier studies, the group of interaction variables between or among players are essentially derived from observation in the field. To formalize this group of variables, I distinguish two levels of analysis:

- The first level concerns interactions between or among internal players, i.e., the intensity of interpersonal communication in the organization, and the exchanges of information and skills between or among parties within the IMC.
- The second level is interactions with outside players, perceived through the intensity of exchanges with those outside the organization. In fact, relations with other specialized intermediaries and exchanges of information with outside colleagues may provide clear complementary elements in decision-making by portfolio managers.

Contextual Variables

In actual practice, even if IMCs are operating in the same sector of activity, there are numerous immediate contextual factors that may influence the organizational behavior adopted by one or another IMC (e.g., number of personnel, number of managed funds, total assets in managed funds, affiliation with a parent company). Several studies have shown that the contextual factors appear to be a determinant of organizational behavior adopted by an entity. It would therefore seem possible to suppose that the relationship between organizational behavior

(formal and interactive variables) and performance may depend on the immediate context of the IMC.

To formalize the context of the IMCs, I follow work on analyses of contingency theory (see Lawrence and Lorsch [1967]) and Kalika [1995]. The contextual variables retained are:

- *Size*, which is supposed to play a role in the organizational behavior of firms. Several empirical studies have highlighted a positive correlation, for example, between the size and the degree of structuralization of the company (see Kalika [1995]). Three size criteria are evaluated: number of personnel, number of funds, and total amount of assets managed.
- *Type of ownership* (subsidiary organization or independent organization), i.e., whether the IMC is dependent on an external entity is also recognized as having an influence on the behavior of the firm. Some studies have shown that a firm dependent on and controlled from the outside will have a tendency to formalize more of its behavior, as managers must justify the results of their actions to third parties. This could be the case for certain IMCs that cannot break free of the management recommendations of parent companies or managed fund promoters.

Variables Describing Performance of Managed Funds

Since development of the mean-variance model proposed by Markowitz [1952], the risk-return pair has been at the heart of evaluation of portfolio management performance. Several methodologies, principally from work by Treynor [1965], Sharpe [1966], and Jensen [1968], enable us to represent the two parameters of return and risk in very concrete terms. The choice of a methodology is a very delicate one, however, given the many choices we have.

I eliminate Treynor's method and its derivatives as they use the beta coefficient as a risk measurement, which does not seem appropriate for funds that are invested entirely in shares and on the same market. The Jensen method and its derivatives (depending on arbitrage pricing theory or APT) are also eliminated because of the difficulty inherent in selecting and determining the number of factors to be integrated into the model.³

The Sharpe method attracted my attention in the first place because of its universality. In fact, risk is measured using the standard deviation, which is suitable for

funds invested in any category of asset (equities, bonds) and on any market. I then decided not to use it because it applies the risk-free rate. That is, comparison of the return from a fund and the risk-free rate is of interest, in theory, only to the individual investor who decides between a risky investment and a no-risk investment. But in a professional context, many portfolio managers adopt an active management approach, intending to follow and beat an index (or *benchmark*) defined in advance. Thus I use for this study the information ratio (also known as the appraisal ratio).

Information ratio (IR) as a performance measure. The IR, a cousin of the Sharpe ratio, compares the return of a reference portfolio with the return of the fund studied, taking account of any risk differential. If we consider a portfolio p and a reference portfolio m , the IR is the ratio between the excess return of portfolio p in relation to the market m , given the excess risk taken by the manager in relation to the reference portfolio. It therefore constitutes a measurement of success in active management around a reference.

The numerator is the yield spread obtained, which may be positive or negative, and the denominator is the risk taken to be excluded from the reference portfolio. This gives:

$$IR_p = \frac{(R_p - R_m)}{\sigma(R_p - R_m)} \quad (1)$$

where IR_p is the information index of the portfolio indicating the success of active management on the market portfolio; $(R_p - R_m)$ is the excess or deficit of the portfolio return (R_p) on the market portfolio return (R_m); and $\sigma(R_p - R_m)$ is the degree of risk taken of being excluded from the reference portfolio.

This last element is called *tracking error*. It can be represented by the classic formula of the standard deviation as follows:

$$Tracking\ Error = \sqrt{\frac{1}{T-1} \sum_{t=1}^T [(R_{p_t} - R_{m_t}) - \overline{(R_p - R_m)}]^2} \quad (2)$$

where T is the number of return periods.

The standard deviation considers both positive and negative deviations from the mean as a potential risk. Thus, in this case, overperformance relative to the mean is penalized just as much as underperformance. To address this anomaly, we must use another risk measure.

Lower partial moments (LPM) as a risk measure. According to Bawa and Lindenberg [1977] and Fishburn [1977], lower partial moments (LPM) (also called *downside*

risk) is a good alternative to variance or standard deviation. LPMs depend on the attitude of the investor facing the risk of a return below a given threshold. It is therefore important to control the risk in order to keep returns above this threshold. The option is thus to replace the variance by LPMs that take account only of fluctuations in risk lower than the threshold set.

In general, the n -order lower partial moment of the return of a portfolio R_p in relation to a target m (generally the mean of the return, unless a required return is established at the start, or the market portfolio return) is calculated by the formula:

$$LPM_n = \sum_{R_p \leq m} P_p (m - R_p)^n \\ = \sum_{p=1}^k P_p [\min(0, R_p - m)]^n \quad (3)$$

where P_p is the probability of obtaining the return p , and R_p is a discrete random variable that represents the portfolio return. It takes K values; n is the LPM degree; the expression $[\min(0, R_p - m)]$ signifies that if a given return is higher than the target (m), the deviation between the return (R_p) and the target (m) is replaced by 0; otherwise the deviation is taken into account for its value in the sum.

The moment that interests us is the square of the negative deviations with the mean, also called *semivariance* or *second-order lower partial moments* (LPM2). In terms of tracking error, the LPM2 is calculated as follows:

$$\text{If } (R_p - R_m) > (\overline{R_p} - \overline{R_m}) \text{ then } [(R_p - R_m) - (\overline{R_p} - \overline{R_m})] = 0$$

$$\text{If } (R_p - R_m) \leq (\overline{R_p} - \overline{R_m}) \text{ we include the result of } [(R_p - R_m) - (\overline{R_p} - \overline{R_m})] \text{ in Equation (2).}$$

From an empirical point of view, there is disagreement over whether the LPM approach leads to results significantly different from the mean-variance approach. In fact, everything depends on the distribution of the returns;

the more that returns diverge from the normal distribution, the more the two approaches may lead to empirically different results (see Lee and Rao [1988]). The most recent studies generally favor the models based on the LPM (see Harlow [1991]; Guedhami, Roy, and To [1999]). Portfolio management using LPM has also been attracting practitioners' attention more recently.

ANALYTICAL MODEL AND HYPOTHESES

Exhibit 1 summarizes the research model. Two groups of *independent variables*, the formal structural behavior variables and the interaction between or among players variables, and a *moderating variable*, the context variable, will influence the performance of funds managed.

The research hypotheses are as follows:

Hypothesis 1: The investment management company context has an influence on the formal structural behavior (H1.1.) and the interaction between players (H1.2.).

Hypothesis 2: The formal structural behavior of the IMCs has an influence on the performance of the funds managed.

Hypothesis 3: The interaction behavior between or among players (internal or external to the IMC) has an influence on the performance of the funds managed.

DATA, SAMPLES, AND HYPOTHESES TEST

I collect qualitative and quantitative data in the field in order to test the hypotheses. Tests rely on a causal data analysis using partial least squares.

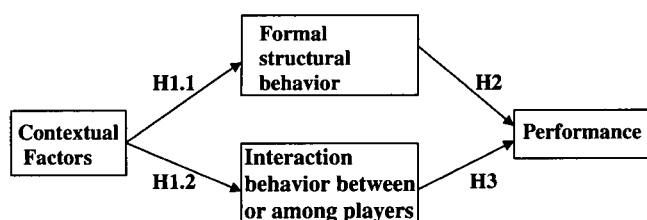
Organizational Data

The organizational data were collected in a mail survey followed by telephone calls to the respondents. The questionnaires were sent to portfolio managers, key players within IMCs. In the process I assembled a sample of 59 IMCs, nearly 20% of the IMCs on the Paris market at the time.

Of the 59 IMCs, 23 are independent IMCs (39%). The 23 include 6 banks, 2 insurance companies, 2 stock-brokerages, and 5 securities firms (recently qualified as financial institutions) with a management service or department integrated into their main activity. The remaining 8 independent IMCs were set up by former intermediate portfolio managers. 36 IMCs in the sample are subsidiaries (61%) run by financial institutions that have granted autonomy to their management activity on the recommendations of the Financial Markets Authority.

EXHIBIT 1

Model and Hypotheses



Not accounting for amounts not reported in responses, the IMCs in the sample managed approximately 500 billion euros, or over 76% of the total of French Undertaking for Collective Investments in Transferable Securities (UCITS) assets on the Paris Stock Exchange at the time of the study. As the sample represents over two-thirds of the total amount in managed funds in France when the survey was conducted, it is quite representative of the total population. In addition, the total number of UCITS on the Paris stock market was 5797, of which 4628 were FCPs and 1169 SICAVs. The IMCs in the sample ran approximately 3253 UCITS, representing 56% of the total number.

Financial Data

Europformance, a leading French mutual fund information provider, agreed to provide its weekly net asset values. The data relate to marketed funds (FCP and SICAV), i.e., funds whose shares may be freely acquired by subscribers. A fund included had to have available all weekly net asset values over the period of the study (five years).

Some funds were deliberately excluded because of their nature. Guaranteed profit or protected funds are excluded as these two management objectives do not appear to be relevant in judging the performance of one fund or another. Similarly, money market funds are excluded; their

performance is virtually indexed to short-term rate evolution so the performance of their portfolio managers would bear no relation to the performance of the particular fund.

Funds using multi-manager management techniques, so-called umbrella funds, are also excluded. Such products are not invested directly in marketable securities on financial markets but are made up of parts of other funds selected from those managed by other IMCs. The performance achieved thus is not related to the IMC that sponsors the fund.

A total of 324 French UCITS (126 FCP and 198 SICAV) are included in the analysis. To carry out the causal study, the UCITS are grouped into three main categories: equity UCITS (French and international), diversified UCITS (French and international), and finally, bond UCITS (French and international).

Partial Least Squares (PLS)

To validate the working hypotheses, the use of second generation analysis methods (structural equation modeling) seemed the most appropriate. The attraction of these methods lies in introduction of the latent variable (or constructed) concept. By definition, this concept cannot be observed directly but is deduced from one or more observable variables (or indicators). These methods are also useful in testing directly the structure of relationships between groups of variables, where first generation traditional data analysis methods are less effective.

Partial least squares (PLS) and the analysis of covariance structures, LISREL (linear structural relations), are the two most common methods. Given constraints with respect to the size of the sample and the nature of the data (absence of normality), I opted for PLS.

Exhibit 2 shows the multiple correlation coefficients between constructs, i.e., the results of regressions between explanatory variables (or exogenous variables) and explained variables (or endogenous variables) that measure the importance of the dependence between the two types of variable. The figures in parentheses indicate the squares of the multiple correlation coefficients, which measure the percentages of the explained variables due to the explanatory variables. These last two criteria provide the answers to the hypothesis tests.

EXHIBIT 2

Results Using PLS

Hypothesis	Hypothesis title	Results	Conclusion
H1	H1.1: The IMC context has an influence on the formal structural behavior	$\gamma_1 = 0.691$ (48%)	Validated
	H1.2: The IMC context has an influence on the interaction behavior between or among players	$\gamma_2 = 0.153$ (2.34%)	Validated
H2	The formal structural behavior has an influence on the performance of managed funds	$\beta_2 = 0.066$ (0.4%)	Validated: Despite the weakness of the link, the influence of formal structure behavior on performance is positive and significant.
H3	The interaction behavior between or among players (internal and external) has an influence on the performance of managed funds	$\beta_3 = 0.371$ (14%)	Validated: The interaction behavior between or among players has a more significant influence on performance than formal structural behaviors.

ANALYSIS OF RESULTS

Exhibit 2 indicates that all the hypotheses are validated. An investment management company's working context (criteria relating to, e.g., size, membership of a group, age) influences the organizational architecture characteristics of the firms studied (degree of structurization, formalization, control). The context influences the formal organizational policies implemented (H1.1.) at a level of 48%. This same context also influences informal organizational characteristics (H1.2.), the interactions, whether spontaneous or planned, between internal players or with their outside partners. This is a weaker relation, however, as only 2.34% of interaction behavior between players depends on the context.

These results are predictable and confirm a variety of other studies in organizational behavior. It is broadly accepted that the working environment or context of a firm has a definite influence on its organizational architecture.

More interesting are the results concerning the organizational architecture/performance relation. The hypotheses on the impact of formal structural behavior (H2) and of interaction behavior between or among players on performance (H3) are verified. The relation between the interaction behavior between or among players and performance is more significant (14%) than the relation between the formal structural behavior and performance (0.4%). Performance may then be explained principally by the intensity of the interactions between or among players inside and outside the IMC.

The management team and the network of relationships that portfolio managers maintain with the outside seem to be two important factors in explaining performance. Fund performance would therefore improve with the degree of information exchange.⁴

This result is not surprising in that portfolio management is an activity based essentially on information. An IMC is above all a decision-making entity relying on the information that players have, and communicating and exchanging information often can mitigate market uncertainty. This result also seems to demonstrate that formal organizational policies implemented by IMC managers are only a means to structure the behavior space for players; this consideration may explain that, in the end, formal organizational behavior appears only indirectly to explain performance. In fact, when we analyze the indirect influence of formal structural behavior on performance in terms of the degree of interaction between players, we find a high score, 33%.⁵

On the one hand, formal organizational policies often play a role in integrating the actions of portfolio managers into an IMC's own investment policies. On the other hand, they should meet the control requirements of the regulatory authorities intended to limit any excesses on the part of portfolio managers.

Our results seem to confirm the importance of the information factor in financial markets. Securities in financial markets are valued by obtaining and processing information related to listed companies and information related to the global economic environment. It is therefore logical that portfolio management companies with the most developed organizational capacities to gather, process, analyze, and make the most of information achieve better performance than others. A processing capacity may be organizational in origin. Organizational architecture therefore has a role to play in the fundamental link between information-organization and information management-fund financial performance.

My test results enable us to reconcile the theories of organizational effectiveness and of financial market efficiency. A simplistic approach to market efficiency theory may let us think portfolio management companies have no utility, since it is not possible to predict in advance the evolution of security prices, and optimum portfolio management is to invest in all securities on the market. IMCs are useful, however, not in attempting to determine the future evolution of security prices but rather in enabling portfolio managers to better use the information they need. In this regard, organization is fundamental.

IMCs with better organizational architecture would also perform better. Ongoing competition between IMCs should encourage them to constantly restructure their organizational architecture.

CONCLUSION

Research into organizational science has been of secondary importance in the asset management industry for some time. The importance of fund performance measurement has been emphasized for a variety of reasons. But more and more investors, whether individuals or institutions, who prefer to entrust the management of their savings to professional portfolio managers pay attention to the organization of a firm. This is shown by the appearance of new players (consultants, rating agencies, etc.) intervening between the investors and IMCs in order to decide on the management delegation choices for the investors. These players analyse the performance shown on the managed funds, but also the organizational factors of the IMC.

The question to ask, however, is whether the organizational architecture adopted by a particular IMC can affect the relative importance of the performance of the funds managed. My central objective has been to answer this question.

I measure characteristics of organizational architecture using formal structural variables and variables for interactions between or among players (particularly related to exchanges of information). I measure performance using the risk-return ratio.

The results of a causal study show that interaction between or among players' variables have a stronger explanatory influence on performance. The performance of portfolio managers could thus be explained principally by the intensity of information exchanges of skills and know-how between or among players within and outside the organization. Thus the formal organizational policies established by the IMC managers constitute only a resource that could be used to structure the portfolio managers' behavior area, particularly to meet regulatory requirements.

Studies relating to performance measurement of investment funds should be complemented by approaches that are more qualitative in nature and that analyze the investment strategies that are performed upstream, where factors such as arbitrage and discussion often come into play. Work such as this would certainly enrich our understanding of the role of professional portfolio managers and the factors that determine their performance.

ENDNOTES

¹In France, legislation of July 2, 1996, on the modernization of financial activities delegates portfolio management activity on behalf of third parties to authorized "Investment Companies," more commonly called investment management companies (IMC). To adapt legislation to changing products and professions, a "services" directive (2001/107/CE) and a "products" directive (2001/108/CE), adopted January 21, 2002, modified the regulation of products and management companies and made many funds exportable that had not been before. This was replaced in France by the financial security law (LSF) of August 2, 2003, and then by application decrees and regulations by the Financial Markets Authority (AMF) of February 13, 2004.

²Recall the Daiwa and Barings Bank scandals that hit the headlines a few years ago.

³To avoid the problem related to a single reference index selection, a number of multifactor methods have been developed to account for the numerous factor categories (exogenous and endogenous) that may have an influence on prices

and return. These methods, which are similar to the Jensen model, come from the APT theoretical framework.

⁴If we accept that this can be measured by the degree of interaction between players.

⁵The structural equation models are used to evaluate both the direct and indirect effects between variables. The total effect of two or more variables is then the sum of the previous effects.

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