

The Other Complexity

In the last Report, we noted the difficulty that companies face vis-à-vis the phenomenon of complexity.

Trapped in a mechanical-linear paradigm, the initiatives designed to deal with this experience, at the end of the day, end up generating even more complexity, which brings more insecurity, which in turn converts into new actions that end up producing more complexity. And so, the cycle feeds itself. The spiral needs to be halted. And it all starts by incorporating a different mental model. No one that's linear, but rather, 'complex.' Here the word 'complexity' changes state. We have moved from the noun, synonymous with confusion and complication, to the science that deals with phenomena with a large number of connected agents, often interacting without central control and resulting in emergent behaviors. That is, something 'different' appears that could not be predicted by the sliced analysis of the component properties. What are the properties of this model that specifically interest us here?

Diversity of Perspectives – Diversity refers to the variety of experiences, thoughts, and cognitive repertoires of the agents or members interacting in the system. We are talking at the component level, not the breadth of programmed responses to deal with the environment (Ashby's Law). In networked or connected systems such as companies the importance of diversity of elements comes not only from ensuring a broader spectrum of views and perspectives but also from generally making them more robust. Diverse systems hardly ever collapse entirely.

Autonomy – Comprises the capacity for self-initiative and freedom of decision. Finding the right balance between autonomy and control has been challenging for companies. In order to cope with the increasingly unstable external environment,

experiments have shown that more decentralized models, with smaller teams, promote more collaboration, mutual trust, accountability, and empowerment, and present more agile and tailored responses. Companies have sought innovations in organizational design precisely in this direction, as is the case of squads. Squads are devices that, when used correctly and sparingly, provide agility, and allow a large company to operate with a start-up mentality because each unit behaves as such. At Spotify, a company that pioneered the implementation of the squad, each cell "basically decide what to build, how to build, and how to work together while building it" (Kniberg, 2014), making autonomy the main element of motivation. Naturally, the autonomy of the teams is aligned with corporate priorities and strategies. Such an arrangement is so close to the model of complexity science that Spotify has already been classified as an 'emergent organization'¹.

Another company known for its decentralized management model is Constellation Software Inc (CSI), which since 1995 has been building a unique portfolio of some 500 software companies. Constellation has become a successful acquisition machine, and the annual letters from its discreet founder, Mark Leonard, are one of the rare opportunities in which this expert in capital allocation shares his reflections on the very particular model

¹ In the same way, management tools have also been renewed from the understanding of this new configuration of more collaborative and collegiate work, one which empowers decision-making capacity at the ends, as is the case of scrum (project management methodology) and the objectives and key results (OKRs) themselves, a dynamic system of measurable goals that draws on inputs from employees, thus bringing more commitment and engagement to the process.

of integration and alignment of the companies acquired:

We continue to believe that autonomy and responsibility attract and motivate the best managers and employees (Leonard, 2015). And further, explaining the unusual simplicity of CSI's organizational design: The Operating Groups provide a low overhead environment where autonomy, collegiality, and shared knowledge are the cultural norm, and good people thrive. I am incredibly proud of what they have accomplished (Leonard, 2021).

Innovation – As a consequence of the more decentralized, non-hierarchical design, which promotes autonomy, motivation, and empowerment, companies gain in innovation speed. The relaxation of control tends to bring modularity, which facilitates the emergence of innovations. Where the business environment is more fluid, the importance of a permanent flow of new ideas and solutions at the top becomes paramount. Jeff Bezos stated that *"invention has become second nature at Amazon"*. In his annual letters, he often reminds us of the direct connection between corporate culture, empowerment, and innovation:

Invention comes in many forms and at many scales. The most radical and transformative of inventions are often those that empower others to unleash their creativity – to pursue their dreams (2011).

We have the good fortune of a large, inventive team and a patient, pioneering, customer-obsessed culture – great innovations, large and small, are happening every day on behalf of customers, and at all levels throughout the company. This decentralized distribution of invention throughout the company – not limited to the company's senior leaders – is the only way to get robust, high-throughput innovation (2013).

Self-organization – In the mechanical model, which views the company as a closed system, the less entropy, the less thermodynamic activity, the closer you are to equilibrium, and the more order in the system. In this ordering, the main role of 'scientific' management would be to promote predictability and hierarchical structures to guarantee

the precise definition of task division to ensure low levels of organizational entropy. Thus, the command-and-control model, where decisions are centralized in top management, usually generates more coherence and stability. On the other hand, it usually brings more resignation than commitment. In more horizontal companies, where there is more flexibility and freedom of action, disorder and entropy would be higher. *"A high level of organizational entropy is necessary for increasing creativity and innovation, which will contribute significantly to achieving competitive advantage"* (Bratianu, 2019).

From a complexity perspective, companies can be seen as 'dissipative systems' (cf. Prigogine), far from equilibrium and permanently exchanging energy with the external environment. It is a fact that many open systems (such as living beings, for example) manage to learn, self-modify, and maintain internal coherence through the spontaneous formation of order, even in the face of apparent disorder; this is a property known as 'self-organization.' That is, from the local interaction of components/agents without any central command, leadership, or need for prior design – coherent behaviors at the global level – emerge spontaneously.

In practical terms, the change from the mechanical mental model to the complex one means shifting the emphasis from processes/rules to people; from parts/components to interactions/connections. Autonomy is associated with greater motivation, a sense of belonging, and tends to make the company more innovative, responsive, and agile. According to this view, the role of management is now different. It consists in promoting the conditions to facilitate the spontaneous emergence of collaborative behavior, that is, the self-organization typical of complex environments. And so, companies are discovering that instead of specifying each step of the management process in advance; by offering more freedom for individuals to spontaneously engage in interactive experimentation and exercise creativity, more satisfactory results ensue. *"The very best an organization can do is to give its people the tools they need in order to do as well as they can – and then get out of the way"* (Klein, 2000). For example, many technology companies have experienced the dilemma of whether or

not to open up their interfaces so that the ecosystem of external developers can connect. Despite the risks and trade-offs, those that have done so have captured huge up-front benefits from network effects. Emulating the conditions of life, a more open and freer environment can be expected to become more sustainable and export entropy rather than absorbing it². That is, counterintuitively, through the veins of complexity science, order can be generated from autonomy, and not exclusively from the exercise of control, not least because “*achieving perfect control of a self-organizing open system is an unattainable utopia*” (Martínez-Berumen et al., 2014)³. The resulting gain is clear: When a company operating in an open system is able to self-organize, by construction, it will be more robust to disturbances and demonstrate a greater ability to adapt to change.

In the previous Report, we presented the argument of Reed Hastings (of Netflix) about what, in his view, would be the main effect of complexity: dilution of the highest-performing talents. Increased complexity produces disorder, stimulating a procedural mentality and the exercise of control. By making companies more bureaucratic, complexity ends up driving out the best talent. From this diagnosis, Hastings suggests the following prescription: Instead of trying to *control* complexity, one must stimulate innovation, and move up the hiring curve of high-performing individuals. Against complexity – autonomy, innovation, collaboration, self-organization.

Now one of the best-known examples of business success based on the concept of self-organization is Visa. Still in the late 1960’s, when there was no internet or magnetic strips, in an absolutely visionary way, Dee Hock, Visa founder and first CEO, conceived the

2 ‘Exporting entropy’ does not mean producing negative externalities to the environment. On the contrary, as Edgar Morin, philosopher of complexity, said, any self-organizing system is, in fact, self-eco-organizing, in the sense that it is not only dependent on the external environment, but that the environment is “suddenly inside it, and... it plays a co-organizing role” (Morin, 2008).

3 Naturally, the underlying assumption is that elements of internal controls are present in these open systems that allow them to maintain a minimum of coherence by eliminating or balancing the disturbances that could eventually destroy them.

organizational and governance architecture between banks that transformed the then precarious credit card business into a global ‘electronic value exchange’ system. Hock was an original thinker, a ‘corporate rebel,’ and eschewed the traditional management pattern dominated by hierarchical command-and-control structures. Born in a small town on the edge of the Rocky Mountains, from a young age he sought inspiration for his thoughts in nature. He believed that companies should configure themselves in a self-organized and self-governing way and embed elements typical of complex systems such as surprise, adaptation, and non-linearity. Thus, amidst the apparent confusion, coherence should emerge, as was the case with Visa, defined by Hock himself with the neologism of a ‘chaordic’ organization – ‘chaos + order’ (Hock, 2005).

Another consequence of incorporating the mental model of complexity is the view that the principle of conservation (as mentioned in the previous Report) is not a valid universal standard. And so, unlike the linear worldview, from the perspective of complexity, simple rules can produce quite intricate behavior, such as the enigmatic geometry of Mandelbrot’s fractals, which

Dynamo Cougar x Ibovespa Performance in R\$ up to April 2023

Period	Dynamo Cougar	Ibovespa*
120 months	172.9%	86.8%
60 months	42.3%	21.3%
36 months	10.0%	29.7%
24 months	-35.1%	-12.2%
12 months	-12.0%	-3.2%
Year (2023)	-6.9%	-4.8%
Month (April)	-0.4%	2.5%

(*) Ibovespa closing. Indices are presented as economic reference only, and not as a benchmark.

are formed from relatively simple commands. On the other hand, complex processes with large numbers of densely connected components/agents can result in well-defined emergent behavior patterns. And there are countless examples in biology, physics, chemistry, and the human sciences; for example, anthills and beehives, flocks of birds, tornadoes, life, the mind, cities, the world wide web, language, the stock market, and companies themselves – all of these are phenomena that express cohesion and meaning from diverse and dispersed elements.

Dealing with complexity (in the traditional sense of what is complicated, and intricate) has been a growing challenge imposed on businesses. This problem is particularly acute in Brazil. Affected by the excessive and often untimely production of legal rules, the country favors an instability of the legal order. And oftentimes, this ends up elevating the status of the activity of managing Brazilian companies to that attributed to extreme sports. Discussions about repeals, reinterpretations, reinventions, and retroactivities of rules are a frequent part of the regulatory-legal agenda in the country, producing uncertainties and additional difficulties to the already stressful remit of the executive. As a result, we see exhausted executives, shortened tenures, and (unfortunately) early retirements, engendering a worrying atrophy in the supply of experienced talent in the profession.

An environment where change accelerates, and surprises are daily triggers anxieties and demands initiatives that reduce such ambiguity. The result of these actions has not been satisfactory. Companies become bureaucratic; they then skate on rules, controls, tools, and processes. And complexity only spirals upward.

We see bloated boards, the proliferation of committees; and a multiplicity of internal regulations, management tools, and even share classes. We see tangled organization charts, corporate structures, and matrix configurations, thus increasing the number of layers of management and the creation of intermediate holding companies, excessive reporting, redundant controls, the proliferation of consultancies, complicated

compensation designs, fuzzy strategic planning, and unwieldy budgeting. We know that many of these initiatives are necessary responses imposed by regulatory requirements. Indeed, some represent important achievements toward greater transparency and accountability for the benefit of all stakeholders. Many, however, appear completely redundant, imposing an unnecessary burden on companies, their shareholders, and the executives themselves.

In light of this tangle of expedients that produce more heat than light, perhaps we are anchored in a mental model that leads us to respond in a mechanical way to a problem that deserves to be understood from a different perspective. Through training and experience, the default response has been to increase the level of control and incorporate new tools into the already congested micro-management apparatus. Believing in solving, as an unintended consequence, often increases the size of the problem. *“When we view organizations as machine-like objects, unavoidably they become complexities of structure, policy, and roles”* (Wheatley & Kellner-Rogers, 1996). As initiatives take place in an environment of increasing digitalization, technology by definition produces an ever-increasing amount of data that needs to be gathered, processed, and translated into new initiatives. The more densely connected environment is fertile ground for accidents, discontinuities, and disruptions, which produces a sense of even greater ambiguity.

The mental model of complexity (science) teaches that open systems, such as companies, are susceptible to self-organization, a property that emerges from the possibility of autonomy/innovation. We are not implying that controls are unnecessary. Absolutely. We are enthusiastic about the discipline of cost/expense management and control, which in many cases is a fundamental pillar of advantage and the main competitive barrier. Indeed, we also know that the numerous interactions inherent to complex systems can lead to disorganization and even chaos.

The message here is that from our take, companies seem to have focused excessively on the necessity – almost imperative – of controls and continue to disregard the potential, counterintuitive, that may arise from a management model that offers room for some

self-organization. Another misconception is to imagine that what looks complicated can only be handled by using correspondingly complicated actions. In fact, often the solution is “simply” making things simple. Aligning a set of basic principles of conduct, clearly stating a few objectives to be pursued, proposing non-exhaustive incentive designs, rescuing the power of founding principles, fostering collaborative engagement, leaving room for responsible participation, that is, adopting the “back to basics” package, may sometimes express the most sophisticated management techniques.

We well know that trying to synthesize qualitative behaviors and attributes into numerical metrics is an imperfect exercise. Even so, and in alignment with this reflection on the role of simplicity, we end up risking a message that is also too simple. A suggestion for monitoring the evidence of deviations in the labyrinth of complex controls and micromanagement would be to take a harder look at the item ‘general and administrative expenses.’ And here it is worth looking at not only absolute values and percentages (over net revenue), but also their composition. At the extreme, we should try to distinguish growth G&A from maintenance G&A, as is already done on a routine basis with respect to capex (investments). A detachment of G&A from historical trends could be admitted in terms of a proportional increase in the “growth” component. On the other hand, the obesity of the ‘maintenance’ component is always more worrisome. This may suggest, as a trend indicator, that the company is starting to lose the fundamental battle of agility, which brings us back to a passage in Dynamo Report 108 in which we commented on the work Scale, by physicist Geoffrey West. There we noted that, *Under the imperative of efficiency and competitiveness, as companies grow, they need to become more focused, becoming more rigid and monolithic, losing diversity and the capacity for innovation. They become more bureaucratic, and costs begin to increase disproportionately, like an organism that ages and loses its homeostatic balance, allocating growing energy to maintenance and less to the metabolism”.*

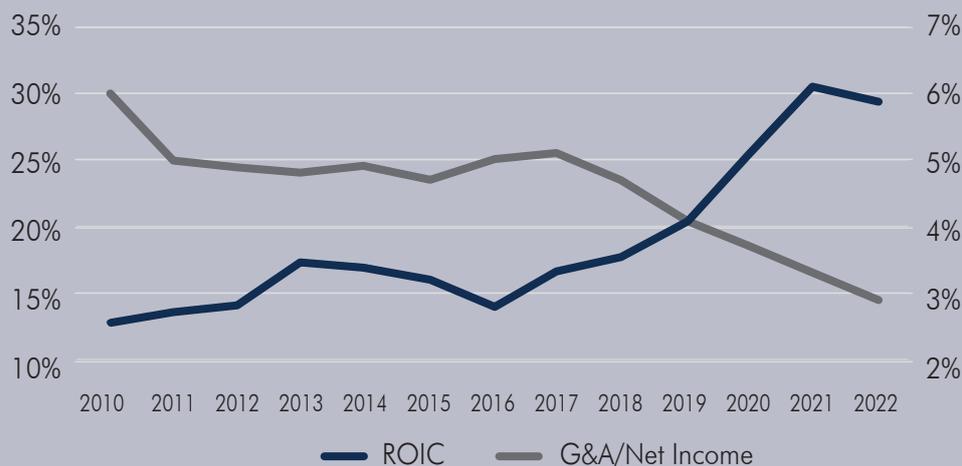
Of course, even a metric as seemingly ‘harmless’ as G&A can hide accounting liberalities, and it is not always so easy to precisely identify the boundaries of each subset. It is even worse when we see some of these typical expenses being capitalized as investments.

Escaping the P&L, they leave a cleaner operating result, which usually pleases the market and especially the executives whose compensation packages are be more aligned with EBITDA than to ROIC.

A company that has been suffering from the effects of an increase in complexity is Natura. The option for a holding structure as a design to leverage growth has proven to be expensive and dysfunctional. It’s a typical example of the perverse effects that creating new managerial layers can bring. In line with the reflections and experiences that we have made throughout the last two Reports, we had been expressing our apprehensions about the effectiveness of this configuration, whose effects started to be reflected not only in the operational margins but also in the Group’s capital structure. Realizing the gravity of the situation, the company has been taking structural measures to reduce corporate costs, as well as to promote changes for greater operational agility and financial adequacy. Under this more adequate and leaner ordering, the potency of the Natura brand, with its so-singular meaning, will be able to occupy even greater prominence in the Group’s results.

As a positive illustration, the one that impresses in term of its discipline vis-à-vis expenses is Weg. If we take the last twelve years for example (the series could be much longer), the company has grown revenue by 6.8x, or 17.3% p.a., while G&A expenses have multiplied by only 3.3x, a compound growth of 10.5% p.a.; therefore, G&A/revenue fell by half, from 6% in 2010 to 2.9% in 2022. It is interesting to observe that while expenses are diluted, the return on invested capital (ROIC) increases, presenting an almost inverse trajectory, as if the energy savings of austerity were converted into growth power and return dynamics (Graph 1). In fact, during this period, Weg advanced in its internationalization process – in which foreign revenues rose from 36% to 50% of total revenues – and expanded its portfolio of brands and products by acquiring 34 companies spread across 52 industrial parks throughout North, Central and South America, Europe, Africa, and Asia-Pacific and establishing a global hegemony able to produce up to 70,000 motors/day with its 39,000 employees. Although part of this result can be explained by the exchange rate, Weg defies the statistics of Brazilian

Graph 1 – Weg - ROIC and G&A/Net Income



Source: Adapted by Dynamo based on company reports.

companies that invariably face difficulties both in the execution of internationalization processes and in building a product portfolio via acquisitions. Weg’s cost/expense discipline is one of the visible faces of a unique People & Management culture, which reflects a worldview and business logic guided by an engineering lens where pursuing simplicity more than strategy constitutes value in itself. Here, austerity brings a double gain in competitiveness, economy, and fitness, since, by definition, in the engineering space, the simpler products and services are, the better they are. And so, at Weg, parsimony ends up serving as the engine of propulsion for a consistent and profitable expansion, as captured by the symmetry of the plots in the graph.

If measured G&A serves as a proxy for discipline and a well-executed control regime, research and development (R&D) expenditures summarize the drive for innovation. Innovating is a collaborative process, because it usually consists of the recombination of dispersed knowledge and experience. One can even think of innovation teams in a command-and-control format, but generally innovation and new business units are where autonomy and freedom to explore are most exercised. And so, R&D can indeed be considered a very reasonable trace of self-organization⁴.

4 In fact, empirical studies show that in technology spaces, self-organized innovation (R&D) structures, where by design there is more freedom of exploration, show superior results (Rycroft & Kash, 2004;

Another example that illustrates in an unsuspected way how autonomy, innovation, and creativity are perfectly compatible aspirations with the exercise of control and discipline is Mercado Livre (Meli). At Meli, the focus on detailed execution and technical rigor coexists with a corporate culture that encourages learning, experimentation, autonomy with responsibility, and innovation. In Dynamo Report 98, when we described the rationale for our investment in Meli, we remembered a quote from the then CFO, which summarized this aspect well: “constant innovation is the lifeline of any consumer-facing internet company”. As an illustration, let’s look at what has happened over time with G&A/Revenue (discipline) and R&D/Revenue (autonomy and innovation). Taking the same period of the last twelve years, Meli’s net revenue has grown almost fifty-fold (equivalent to a compound rate of 38.2% pa), while the G&A expanded just over twenty-fold (29.1% pa), causing the G&A/Net Income ratio to fall from 14.2% to 6.3%. In the same period, the R&D/Net Income ratio rose from 7.3% to 14.4%, which represents a growth of almost

Silverberg, 2007). Iconic examples are the research laboratories of General Electric (GE Labs) and AT&T Bell (Bell Labs), century-old institutions that have gathered countless important innovations and have been home to dozens of Nobel Prize winners. Both labs have always been recognized for the wide openness granted to scientists, who could freely choose their research lines without any interference from above.

seventy times in the period (42.3% pa). In absolute terms, we are talking about an amount that jumped from USD 15.9 million in 2010 (just for comparison, half the G&A of that year) to an impressive USD 1.1 billion in 2020 (1.7x the G&A) – (Graph 2). In Meli’s case, R&D spending reflects the foundational belief in technology as an instrument for transforming people’s lives and the business landscape in Latin America. All other corporate values, such as entrepreneurship, innovation, and empowerment, are supported by the core foundation of technology, which in turn results from a work environment where a co-creation experience is cultivated that promotes ‘human connection and empathy,’ ‘learning,’ ‘collaboration,’ ‘engagement,’ and ‘physical and emotional well-being,’ i.e., properties typical of self-organizing processes. These are attributes that may sound like puerile aspirations. But they are not. If pursued with conviction, they can make a difference.

Complexity challenges companies because it places them at the edge to a major fork in the road. Those that manage to cope well with the difficulty of the complex move forward, establishing an even greater distance ahead of the competitors. Those that, on the contrary, fail to deal with it, get involved in a perverse spiral. In the same Dynamo 98 Report, we precisely expressed this ambiguity typical of complexity when we said: “What most excites us about Meli is that it has lots of projects, and what worries us the most about Meli is

that it has lots of projects.” Mercado Livre has proven to be one of those companies that sail well in challenging waters. Since then, most of the projects have become reality, translated into an even more extensive and deeper ecosystem of online commerce and payments.

There are countless obstacles that stand in the way of corporate success. The origin of the problems can be from several well-known taxonomies: economic cycles, competition, business environment, people, incentives, strategy, execution, organization, leadership, and capital structure, etc. Less remembered are the mental models, the ‘worldviews’ that are fundamentally important because they conceive principles that guide designs and courses of action in advance.

Here at Dynamo, to question is an intransitive verb. Questioning is a basic tool in our analysis work. We are in the habit of also thinking and rethinking mental models, knowing that these are particularly prone to the always dangerous crystallization. Albeit not such an obvious exercise, we believe we gain some additional depth and understanding in the inhospitable task of deciphering the seemingly impregnable reality of companies. In this case, the complexity trap that plagues the daily lives of executives can perhaps be addressed in a different light, through the lens of the other complexity: complexity as a science of open

Graph 2 – MELI - G&A and R&D/Net Income



Source: Adapted by Dynamo based on company reports.

DYNAMO COUGAR x IBOVESPA

(Performance in US\$*)

Period	DYNAMO COUGAR		IBOVESPA**	
	Year	Since Sep 1, 1993	Year	Since Sep 1, 1993
1993	38.8%	38.8%	7.7%	7.7%
1994	245.6%	379.5%	62.6%	75.1%
1995	-3.6%	362.2%	-14.0%	50.5%
1996	53.6%	609.8%	53.2%	130.6%
1997	-6.2%	565.5%	34.7%	210.6%
1998	-19.1%	438.1%	-38.5%	91.0%
1999	104.6%	1,001.2%	70.2%	224.9%
2000	3.0%	1,034.5%	-18.3%	165.4%
2001	-6.4%	962.4%	-25.0%	99.0%
2002	-7.9%	878.9%	-45.5%	8.5%
2003	93.9%	1,798.5%	141.3%	161.8%
2004	64.4%	3,020.2%	28.2%	235.7%
2005	41.2%	4,305.5%	44.8%	386.1%
2006	49.8%	6,498.3%	45.5%	607.5%
2007	59.7%	10,436.6%	73.4%	1,126.8%
2008	-47.1%	5,470.1%	-55.4%	446.5%
2009	143.7%	13,472.6%	145.2%	1,239.9%
2010	28.1%	17,282.0%	5.6%	1,331.8%
2011	-4.4%	16,514.5%	-27.3%	929.1%
2012	14.0%	18,844.6%	-1.4%	914.5%
2013	-7.3%	17,456.8%	-26.3%	647.9%
2014	-6.0%	16,401.5%	-14.4%	540.4%
2015	-23.3%	12,560.8%	-41.0%	277.6%
2016	42.4%	17,926.4%	66.5%	528.6%
2017	25.8%	22,574.0%	25.0%	685.6%
2018	-8.9%	20,567.8%	-1.8%	671.5%
2019	53.2%	31,570.4%	26.5%	875.9%
2020	-2.2%	30,886.1%	-20.2%	679.0%
2021	-23.0%	23,762.3%	-18.0%	538.9%
2022	-7.8%	21,899.9%	12.0%	615.4%
2023***	-2.8%	21,273.8%	-0.7%	610.3%

(*) Considering that this is a Fund that has existed since 1993, the figures were converted into dollars (US\$) as a way to eliminate the volatility of the Brazilian currency throughout the period and, in this way, minimize the risk of possible misinterpretations by the reader in the case of an investment decision/ divestment. Dynamo Cougar is a fund that invests in NAV of an equity investment fund and is currently closed for new investments. (**) Ibovespa closing price. The index is presented as a mere economic reference and does not constitute a target or benchmark for the Fund. (***) Return up to April 2023.

systems, which prioritizes the interactions of autonomous agents capable of innovating, self-organizing, adapting, and evolving. A paradigm that seems to us much more adequate for a better understanding and for the evolution of companies.

Rio de Janeiro, 4th May 2023.

Additional information:

- **Inception:** 09/01/1993
- **Objective:** Deliver NAV appreciation above inflation in a medium/long term horizon by investing at least 95% (ninety-five percent) of the fund's net worth in the NAV of Dynamo Cougar Master Equity Investment Fund ("Master Fund")
- **Target investor:** Qualified investors
- **Status:** Closed for new investments
- **Redemption grace period:** 12 months grace period or liquidity fee of 3% for redemption within this time period*
- **Redemption NAV:** D+12 (calendar days)*
- **Redemption payment:** D+2 (working days) after NAV conversion*
- **Applicable taxation:** Equity
- **Anbima's classification:** "Equity – Free Portfolio"
- **Management fee:** 1,90% per year for the Fund + 0,10% for the Master Fund
- **Performance fee:** on the top of IPCA + IMAB*
- **Average monthly net worth last 12 months:** R\$ 5.727,7 Million.

(*) Detailed description provided in the bylaws

To find more information about Dynamo and our funds, or if you wish to compare the performance of Dynamo Cougar to other indices in different time periods, please visit our website:

www.dynamo.com.br

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