

The Web of Complexity

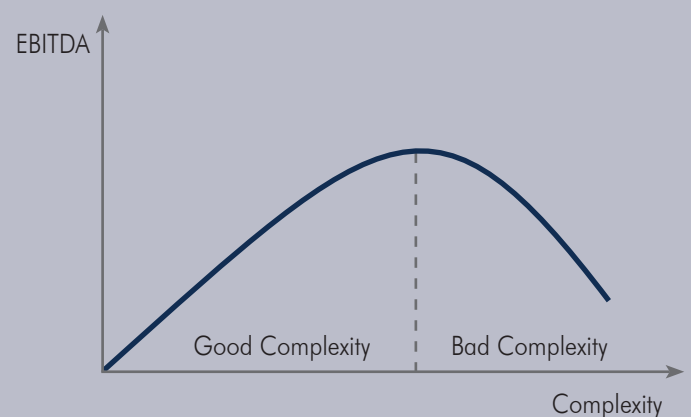
A Harvard Business Review survey (HBR, 2016)¹ of 749 business managers concluded that excessive complexity is a significant problem for companies. No less than 86% of respondents recognized that business processes and decision-making had become so complex as to hinder their ability to grow their companies. Operational complexity manifests itself in a lack of innovation, in detriment to employee satisfaction scores and poor customer service. Half of the participants admitted to having an initiative in place to manage the problem, but only 10% reported being successful. According to the journal, excessive complexity increases operational costs, overloads the IT area, slows companies down, and makes them less responsive. Additionally, it has repercussions in less obvious areas, such as human resources, risk management, product development, and logistics/supply chain. In conclusion, the research states that excess complexity “places companies at a competitive disadvantage.”

In the past (Dynamo Reports 61, 85, and 86), we dealt with the issue of complexity in the business environment in Brazil from another perspective, one diametrically opposed. We highlighted at that time the companies that knew how to take advantage of the regulatory and tax “knots” in order to form specific competencies and establish hegemony over their competitors, arguing that such complication could represent an opportunity to create value and competitive differentiation. They are examples of antifragile companies (Taleb, 2014) in the sense that they have advanced by converting difficulty into attributes of their own.

¹ As usual, in order to make the text more fluid, we’re keeping citations short. For those interested, the complete references of the material we’ve consulted for this and the next Report can be found our website in the library menu, at www.dynamo.com.br/pt/biblioteca.

Both arguments remain valid. In fact, they have already been pacified by means of what has been called the “complexity curve” (Collinson and Jay, 2012). It is recognized that complexity can be good up to a certain point, after which it becomes harmful. Graphically (Figure 1), in the operational performance quadrant, the complexity curve is convex, with an inverted U shape. The first half represents the healthy complexity that produces positive results. It is when the additionality of elements brings more diversity of experience and perspective, confers resilience, and makes the company less vulnerable to imitation. We are in a region where more is better. In the second leg of the inverted U, increasing complexity becomes associated with decreasing returns. Here, the costs of maintaining and coordinating a large number of people/components begin to undermine company efficiency. Processes, routines, and tools that used to leverage the performance of well-connected teams multiply to such an extent that they end up causing overload, confusion, detachment, and the formation

Figure 1 – Complexity Curve



Source: Collinson and Jay, 2012

of internal silos. There is, theoretically, an optimal point or range where the level of complexity intersects with the best operational performance. Because business management is science – albeit also empirical art – there is no theory or algorithm that can pinpoint in advance when each company is within this region. Tough life for the executives.

From this, we can understand the long tradition in defense of the argument for simplicity in the corporate environment – not only as a fundamental attribute of management but as an aspect that should permeate the entire organizational structure of businesses. Simplicity appears as an integral element of the set of values and visions, as an ingredient of the decision-making process, as a “strategic repertoire,” as a design for the operational structure, and as a mindset for management. All of this is supported by a vast literature (e.g., Wheatley & Kellner-Rogers, 1996; Maeda, 2006; Siegel & Etzkorn, 2013; Bodell, 2017; Eckart, 2020; Hobsbawm, 2020). The aesthetic of simplicity is everywhere, and is present in the origins of modern business history, from the classic Fordism, “a customer can have a car painted any color as long as it’s black.”

The aspiration for simplicity in practice translates into Sisyphean work because the forces that drive complexity in companies are permanent. Brazil is still at the bottom of the world rankings, with the worst statistics in terms of tax obligations. Our ‘doing business’ remains confusing. New regulatory requirements arise daily everywhere; moreover, interpretations of rules change frequently – generating additional costs and uncertainties. Digitalization does not seem to bring the expected benefits to companies; on the contrary, the burdens only accumulate. Technology, as we will see below, should help, but sometimes ends up contributing to the complication. Globalization also brings a negative spin in this regard. Companies, driven by the imperative to colonize new markets, geographies, and cultures by expanding their product portfolio, become more matrixed, slower, and more bureaucratic. Many Brazilian companies that have tried to go international are well aware of the size of the challenge.

Peter Drucker argued that organizations needed to have as few levels of management as possible in order to shorten the distances between chains of

command. Each additional level distorts goals and distracts attention. Jack Welch, who based his long tenure as chairman and CEO of GE on the “commitment to simplicity,” went further, stating that such levels of management “hide fragility” and “mask mediocrity.” Welch was an outspoken aggressor of headquarters, the “bane of corporate America.”² The message reverberated. Philips Electronics has set up a “Simplicity Advisory Board” made up of experts from outside the company. Netflix, in its conduct and culture guide, recommended that executives “eliminate unnecessary rules.” Several companies have raised the status of the attribute ‘simplicity’ as a mandatory corporate goal. Not to mention Steve Jobs, who adopted simplicity as Apple’s mantra. In Brazil, Vibra has set as a corporate principle to simplify “the day to day,” seeking “solutions in a simple and agile way.” Localiza, in its “passion for the client” reinforces the goal of never “giving up simplicity and agility.” Nubank elected simplicity as its core inspiration, where both the way of being and the way of doing things are based on a “philosophy of simplicity.” The understanding that “to be simple you have to be simple from the start” expresses the differentiated value proposition of Nubank as a digital bank, which is born already thinking about how to escape the relentless complexity that incumbent competitors face as they scale.

Another pioneering survey (Collinson and Jay, 2012) that was conducted jointly with the University of Warwick and interviewed 600 executives and 5000 employees from nearly 300 European companies, also found alarming results: one in ten executives believes that productivity losses derived from complexity would be on the order of 30%; one in six executives said they pursue 16 or more strategic initiatives simultaneously; one in five admitted to having 16 levels of management in their organizations; one in ten faces more than ten approval stages for capex disbursement, and threequarters face at least four stages; six out of ten companies spend four or more weeks on planning the annual budget, with

2 We know that the biography of Jack Welch has been put to the test, mainly with respect to his personality and leadership style. (Gladwell, 2022). However, within the narrow scope of the argument for simplicity that interests us here, there is no doubt that its contribution has been decisive – especially in the context of the domain of the large conglomerates of the time.

10% reporting that the task can last more than four months; 38% of executives consult more than six IT specialists. And so on.

Given such evidence, researchers at the same university, in partnership with the brand strategy consultancy Siegel+Gale, developed the Global Simplicity Index, whose latest edition (2021) involved the participation of 15,000 respondents, highlighting among others the following findings: (i) 76% of the interviewees reported being inclined to recommend a simpler brand; (ii) 57% of individuals would be willing to pay more for a simpler experience; (iii) a portfolio composed of the brands classified as the simplest has since 2009 shown a return higher than the average of the other market indexes, in the order of 1,600% in fact; moreover (iv) the authors ventured to try and estimate the size of the wastefulness derived from “excess” complexity in the target-companies (Forbes 200), arriving at the figure of around USD 400 billion, or about 10.2% of all operating income measured by EBITDA, that is, approximately USD 1.2 billion on average per company.

Even knowing the limitations that surveys of this nature usually present, the results taken together are impressive; indeed, to such an extent that we decided to take the time to investigate the matter more closely. As a script and driver, we chose to address two simple questions: (i) What is the origin of such complexity? (ii) Why do companies fail to deal with it adequately, instead generating so much frustration among their executives? Because simplicity is a virtue for only a few and is difficult to achieve, the final result was a reasonably dense text. And so we decided to address the first issue in this Report and leave the second to the next one.

Complexity in the usual sense refers to that which is difficult, complicated, confusing, or intricate. It is properly of things that connect, relate, and intertwine. Hence the Latin ‘plecto,’ meaning braided, woven, knotted. Likewise, ‘plicare’ means to fold. That which is complicated has folds; that without ‘plicare’ is that which is simplified.

What is folded and braided is harder to grasp. Our cognitive apparatus is not well equipped to deal with intertwined realities. Nor did we receive training geared to approaching complex phenomena with

appropriate methods. By nature and gaps in our training, the complex challenges us. Ambiguity causes psychological discomfort and as a consequence activates an impulse to act to overcome it. And thus, we try to “solve the problem” with the resources and mental models we have at hand.

When we migrate to the corporate environment, the urge to act in order to overcome the discomfort caused by that which is confusing becomes even more intense. Executives interested in delivering results need to take courses of action. The institutional imperative adds to the natural inclination. The way in which they seek to tame the ferocious persistence of complexity invariably results in establishing new procedures, routines, and interfaces, thus creating additional rules and controls and expanding the use of tools and algorithms. That is, we act in terms of adding elements, further increasing the intrinsic complication of tasks and the environment. And so, yet more complexity arises as an unintended consequence, a byproduct of the accumulation of change in companies as they try to react, grow, and adapt to the demands of a continually changing reality. In this sense, the natural tendency of complexity is to keep expanding.

A sign sensitive to the advancement of the sprawling complexity are the boards of directors composed of an excessive number of members, whose work still unfolds in numerous committees. We know of one company in our universe of analysis that in the past fiscal year held more than a hundred meetings (board of directors and committees). One can only imagine the volume of documents and protocols that need to be generated, not to mention the time required to produce them. Indeed, the sheer quantity of paper begets paralysis. Bureaucracy is in turn the twin sister of lack of conviction. Unconfident directors love to resort to consultancies, which further increases the amount of paperwork, not to mention the costs. Consultancies draw up scenarios and offer a range of viable strategies, possibly generating even more doubts. Even more intelligence must then be embarked upon. The board needs to add more members, the number of committees branches out, and the cycle feeds on itself.

The digital environment, which should simplify, may eventually reinforce this dynamic even more.

The enormous production of information generates cognitive overload, which in turn stimulates the increasingly widespread use of digital tools – much more effective in storing, processing, and transferring large amounts of data. It turns out that systems become increasingly complicated as we tend to add new elements of code, features, and configurations. The ‘stacks’ (cf Dynamo Report 106) of multi-layered technologies accumulate and need to be updated; otherwise, they generate legacy systems (i.e., obsolete, slow, low-compatibility, poorly scaling). When this happens, maintenance costs and the need for support structure rise, data becomes siloed, and security and compliance become more vulnerable, with obvious losses in competitiveness. Not coincidentally, software architecture and programming science are domains where simplicity is perceived as a core value and skill.

In other words, in the increasingly digital environment, where companies are even more connected, coordination challenges and execution risks increase; indeed, discontinuities may eventually occur. The increased level of uncertainty produces additional psychological discomfort. In order to resolve ambiguity, executives will take management and control initiatives that may cause new disturbances, thus adding to the complexity. And so, the system feeds itself. This dynamic, which has been called the “complexity cycle” (Gill, 2020), is in fact a capricious and paradoxical web-like trap where the more executives move, the more paralyzed companies become. It is a powerful gear because it is fed by ingredients rooted in human psychology. Security, stability, control, and power are universal values that are always triggered by fear and the threat that a situation of greater uncertainty represents. When we act to meet these primary emotional needs, we invariably produce even more complexity as an unintended consequence.

At this point, before we move on, it is worthwhile making a brief overview of the main arguments so far:

1. Complexity is a daily challenge for companies.
2. Executives recognize their difficulty in coping with this phenomenon.
3. Hence the aspiration for simplicity, so present in corporate narratives.
4. A few companies do benefit from complexity. Others manage to deal with it well. Most do not.

5. There are several elements that impose increasing complexity on companies, including regulations, technology, and globalization.
6. Complexity also generates psychological discomfort, anxiety, and insecurity. In order to overcome these, initiatives invariably produce even more complexity.
7. In this looping web of complexity, executives become hostages of their own actions.

From our day-to-day interaction with companies, we have had the same perception that the research has captured: We observe that in certain situations executives are having difficulty understanding and dealing with the increased complexity of business. Given the nature of the phenomenon, trying to face this spiral without an adequate reading of what is going on results in wear and tear, waste, and reduced effectiveness. The disappointment with the results of the actions may be due to problems of execution, motivation, strategy, or even a previous reason: an inappropriate mental model. Let’s look at some of the mental models that usually serve as a basis and a tool to interpret the world and, from there, guide initiatives to deal with it.

The first mental model comes from the discipline of cybernetics, from the works of the British scientist W. Ross Ashby. Interested in the phenomenon of homeostasis, particularly in understanding how complex systems operating in frequently changing environments manage to keep critical variables within certain well-defined limits, Ashby came up with the concept of variety, describing it as a measure of the number of states of a system. From there he formulated the “law of requisite variety,” known as the “First Law of Cybernetics”: for the system to be stable, the number of states that its control mechanism is capable of achieving (its variety) must be greater than or equal to the number of states in the system being controlled.

Despite its origin in the context of the self-regulatory mechanisms of biological systems, the proposition was soon embraced by other disciplines (such as organizational design and management) and admitting more colloquial versions. Thus, for a system to be able to deal successfully with the diversity of challenges that its environment produces, it needs to have a repertoire of responses that is (at least) as

numerous in nuances as the problems raised by the environment. Therefore, a viable system is one that can handle the variability of its environment. Or, as Ashby put it, only variety can absorb variety.

Consistent with Ashby's principle, until recently, companies tried to manage the challenges of the environment by trying to reduce the number of varieties they had to deal with. Mass production, standardized products, Ford Model T only in black. Today, the understanding is different: The value of product portfolio segmentation is understood, and online commerce has enabled the long tail of segmented consumer preferences to be met. The complexity of the environment manifests itself in the exponential increase in variety. If the strategy of reducing the range of offerings no longer makes sense, the response of companies, still following the script of Ashby's mental model, has been to proportionally broaden the range of valid responses, believing that, in this way, the number of actions available to control the system is compatible with the number of disruptions it generates. In other words, under this understanding, companies need to have a portfolio of control mechanisms that is at least equal to or greater than the number of potential disturbances/challenges they must face. Hence the proliferation of systems, processes, tools, teams, divisions, meetings, protocols, and rules that comprise the contemporary management ethos of companies³.

The second mental model is borrowed from physics: It is the concept of entropy, the pillar of the Second Law of Thermodynamics. The laws of thermodynamics explain in a fundamental way how the universe works based on the relationships of energy and heat. Entropy is a measure of disorder, understood simply as energy unable to be used to produce work. The second law of thermodynamics states that in isolated or closed systems entropy always increases. That is, isolated systems gradually become disordered until they reach the point of maximum entropy, rest, or thermodynamic equilibrium, where there is no more energy to produce work.

3 *Lawyers and regulators in Civil Law regimes seem to have particular affection for the Ashby Principle; thus, they establish exhaustive norms, imagining they will be able to anticipate myriad reactions and behaviors that would be triggered by the new rule.*

The concept was first used as a metaphor in the business environment in the late 1970s, when "corporate entropy" was defined as the loss of productive energy in corporate work environments (Berry, 1978). And "just as thermodynamic entropy is always increasing in the universe, so too corporate entropy is on the rise" (DeMarco & Lister, 1999). Under this view, the discipline of management would have been conceived precisely to produce order by reducing entropy. Through hierarchical command-and-control structures and rigid process routinization, management's primary mission would be to make tasks more productive and efficient or, in thermodynamic terms, to generate more work than heat.

A third mental model is known as reductionism, which assumes phenomena can be described and understood based on their most fundamental elements. With origins in philosophy, the method spread through the natural sciences, also reaching the human/social sciences disciplines. In management, reductionism materializes according to the mentality that complicated problems must be sliced up and distributed among the areas of specific competencies. Under this perspective, segmentation allows the identification at the source of the determinants of cause-and-effect relationships; therefore, in theory, the effectiveness of localized management actions could be increased.

Of course, all three principles are valid tools when applied in appropriate contexts. Ashby's Law is very useful in game theory, where the repertoire of responses depends on the opponent's portfolio of possible moves. Entropy theory is limited to closed systems, where no exchange with the outside environment is allowed. And reductionist thinking is a recommended method to generate clear and concise answers when the object of interest can be supported by robust statistical evidence.

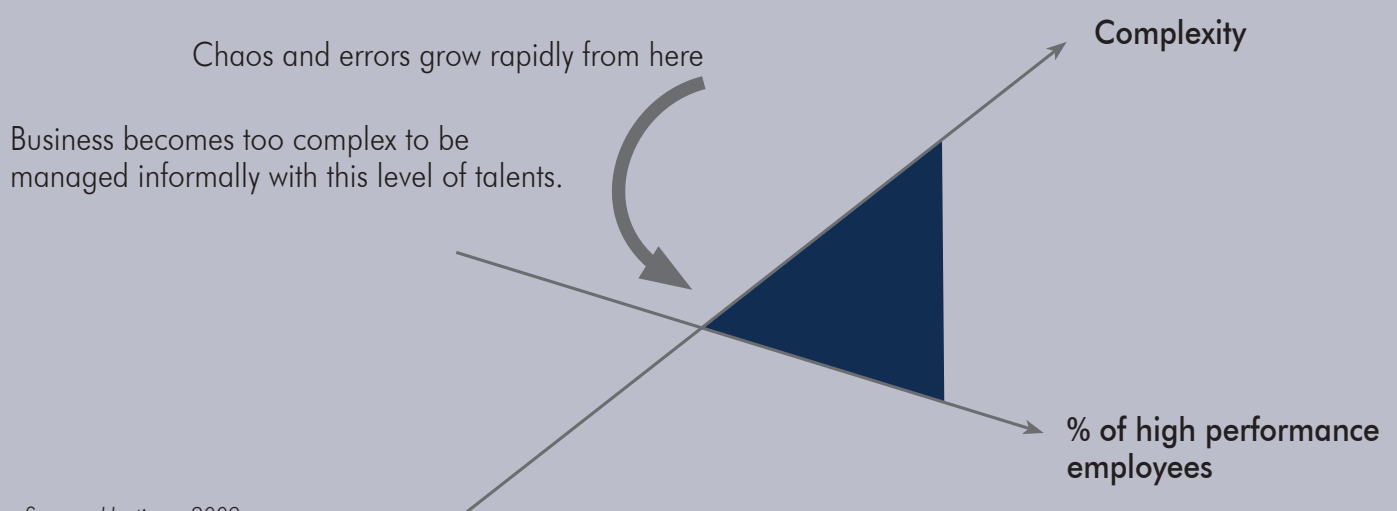
The point is that all three mental models express in common a mechanistic and linear worldview. A consequence of this perception is what has been called "complexity conservation" (Cohen and Stewart, 1994), which consists of the intuition/expectation that complicated things must produce complicated effects and that which is simple can only originate from something simple. We will return to this aspect in the next Report.

A practical result of this linear view consists in the understanding that companies are basically units of production of goods and services, the more efficient the better. In order to reduce unit cost, maximize final product, and avoid any kind of uncertainty or surprise, breaking down factory tasks into parts would be the best industrial arrangement, and hierarchical command-and-control management would be the most appropriate organizational design. Under this paradigm of action and reaction, it would be up to the administration to supervise and intervene, putting the corporate gears back in their settings for optimal operational performance. This classical thinking which prevailed at the beginning of the last century has been refined by successive views/techniques that have marked the evolution of management as a discipline. And so, by the time of the 1950s, “human resources” came to the center of the discussions, considering hitherto displaced elements such as incentives, motivation, and engagement. Already in the 1970s, we saw the climax of “strategic planning” with the dominance of SWOT-type tools. The 1980s brought the persuasive force of “competitive advantage,” and soon came the processes of reengineering and optimization (e.g., Total Quality, Six Sigma), followed already in this century by the imperative of information technology, with the fever for big data and analytics. Each of these understandings contributed in its own way to empowering executives/board members and convincing them that they had cutting-edge tools at hand to make their companies prosper.

As it happens, the development of all this mainstream analytical tooling occurs within the spectrum of a “scientific management” worldview, that is, one based on a traditional logic that is still linear. Incremental response techniques were developed in an attempt to generate order, control, and accuracy, based on a perception that the increasingly fickle and complicated environment was becoming more challenging for companies. By the nature of the spiral dynamics we described above, the more we react mechanically, the more complexity we generate, and the greater the perceived frustration. Hence the perplexity of executives captured in the survey, helpless in the midst of quicksand of increasing complexity – an unintended consequence of their own actions.

Reed Hastings (2009), Netflix co-founder and executive chairman of the board, described precisely this script in his famous presentation on corporate culture. Hastings argued that as companies grow, complexity tends to increase, causing a dilution effect on the contribution of top-performing talent. After a certain threshold, the company begins to face “chaos,” where mistakes proliferate, and management capacity is lost (Figure 2). At this point, as a response to the threat of further disorganization, companies increase their levels of control and become even more procedural. The scope of management is now restricted to seeking efficiency, optimizing existing assets/markets, and reducing errors completely, eliminating any room for bottom-up initiatives. A hostile environment for differentiated talents that do

Figure 2 – Complexity and the dilution of talents → Critical point and the emergence of chaos



Source: Hastings, 2009.

not resist and end up resigning; and the problem is self-reinforcing. As a consequence, organizations become rigid structures without any flexibility or ability to adapt. If the market turns, due to some technological change or unexpected move by a competitor, the organization risks losing relevance quickly. That is, this mechanistic command-and-control model is not prepared to keep up with the demands of an environment characterized by an accelerating speed of transformations, (exponential) growth, disruptions, increasing digitalization, innovation, talent shortages, imbalances, and uncertainty.

Recognizing that we were not able to escape the “complexity” of the text, it is worth pausing again for another brief summary of what we have seen since the last interruption:

1. Still trying to explain the origin of complexity, we choose the “mental models” path.
2. We presented three variants, borrowed from the disciplines of cybernetics (Ashby’s Law), thermodynamics (entropy), and philosophy (reductionism).
3. In all cases, companies and management science are understood within a mechanistic logic.
4. Under this perspective of action and reaction, command and control, all the analytical tools of the so-called “scientific administration” were developed; and these guide the actions of executives.
5. The more we act under this linear paradigm, as we saw earlier, the more complexity we generate.
6. The example of the Netflix co-founder illustrates precisely this argument: under the perceived threat of complexity, companies react by increasing levels of control, which makes them more bureaucratic and complex.

How then can companies escape from the complexity trap, from this feeling of lack of control and powerlessness over something that in principle should be of ordinary management? How to get rid of the paradoxical web of complexity, which converts executive initiatives into rigidity in companies? Offering a respite so that our readers can catch their breath, we will try to address these issues in the next Report. Before that, however, a brief disclaimer.

As a long-term equity investor, Dynamo has been closely following the daily life of companies for three decades; this has been the central object of our analysis, concerns, and endless internal discussions. Still, we don’t see ourselves in the role of interfering in the micromanagement of companies. As a criterion, we usually focus our work on the elements that would increase our chance of success in choosing good businesses and competent executive teams, exercising our role as participatory shareholders whenever necessary. As a method of interaction with management, we prefer the path of dialog through suggestive (Socratic) questioning rather than the clash of assertive positions.

Hence also the frequency in our Reports of drawing the focus of the theme to the field of mental models, where we can deal with fundamental aspects of the realities – the object of our work – which illuminate and improve our collegiate decision process without expressing positions that could be interpreted as pretentious value judgments about the performance of the companies’ management teams.

Along these lines, we risked a diagnosis to explain the embarrassment of executives in general captured in the surveys: the mental model appears to

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

Period	Dynamo Cougar	Ibovespa*
120 months	174.5%	80.8%
60 months	41.7%	19.3%
36 months	27.5%	39.5%
24 months	-33.0%	-12.6%
12 months	-23.8%	-15.1%
Year (2023)	-6.5%	-7.2%
Month (March)	-6.2%	-2.9%

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

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***	-4.0%	21,018.3%	-4.6%	582.1%

(*) 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 March 2023.

us maladjusted. And naturally, the resulting initiatives prove to be dysfunctional. Having done the hard work of preparing the ground, in the next Report we intend to explore this field and, who knows, harvest some fruit for our persevering readers.

Rio de Janeiro, April 26th, 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\$ 5,740.5 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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