Report
DYNAMO 103
3/4 2019

… and Convex

In the previous Letter, we presented our understanding of the virus and its transmission. Now, we address its repercussions on our daily lives. We start with some considerations about the nature of the economy and how the restrictions imposed by social distancing could affect it. Then, we report on the effects of the crisis on capital markets and we take the opportunity to describe how Dynamo has organized its analysis and Fund management in this challenging, atypical moment. Finally, we conclude with a handful of "free" reflections, taking philosophical license in these unusual times of confinement.

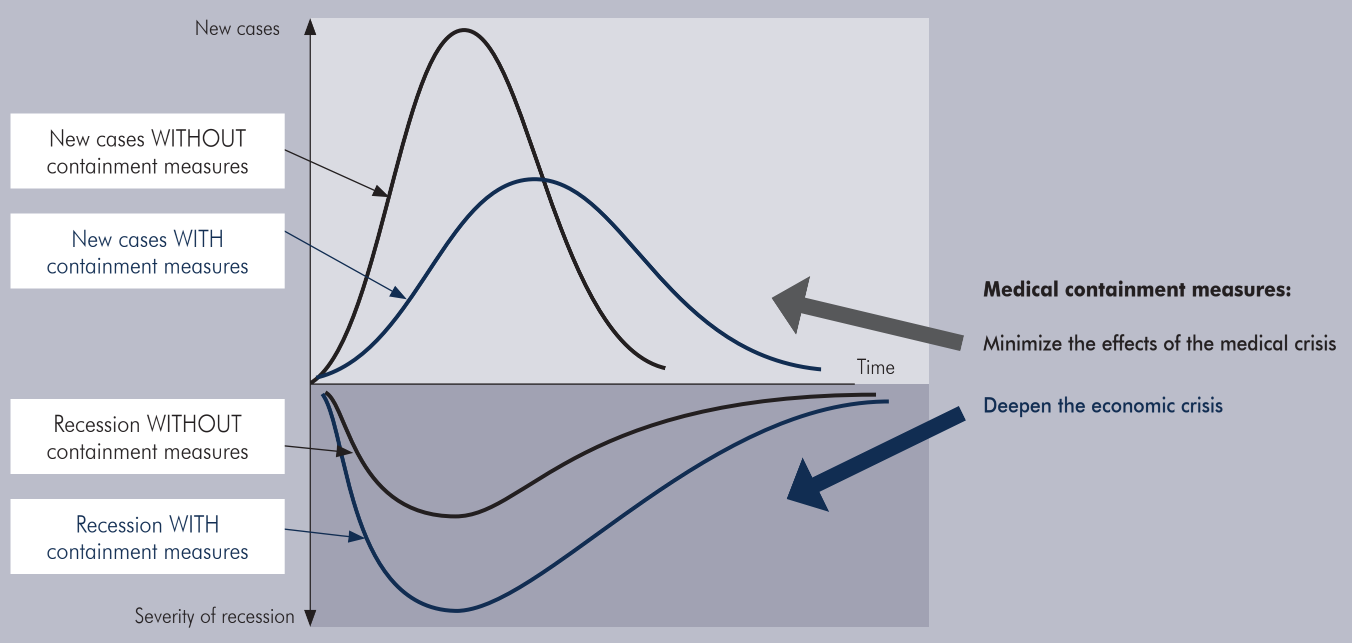
Economy

Faced with the threat and reality of an increasing infection rate, public policy makers around the world quickly decided to adopt measures to restrict movement and confine populations, which has profound repercussions on the economy.

Connections sustain economic activity much like they do viruses. In fact, the economy can be understood as a complex adaptive system much like a pandemic. The same social mechanisms that allow for virus transmission establish economic relations, and stopping the virus has the unintended consequence of also stopping the economy. The dynamic is the same but inverted, the most perverse element being that flattening the curve of the virus causes an even steeper economic recession. The concave curve of epidemiology does not act alone. Like in Escher's magic mirror, the convex curve of the economy can see its reflection under the surface of the lake.

The graph below (Figure 1) presents a synthesis of the dilemmas we are experiencing.

Figure 1 – Containment measures flatten the medical curve but accentuate the recession curve



Source: Baldwin, R. e di Mauro, B., 2020.

Though the health and economic curves are in opposite quadrants, they interact. Nobody knows for sure where the efficient frontier of this graph lies, in other words, where to find the optimum point of social distancing that minimizes the effects of the recession and prevents death. No complete models exist that deal with all the epidemiological, economic and financial variables. Our analytical instruments are inadequate. Epidemiologists and economists need to talk.

Following the virus, the economy behaves like a living being. Life is an enigmatic concept with numerous definitions across multiple disciplines. Some are quite elegant, like the theory of "Autopoiesis."[1] In this understanding, the main characteristic of a living being is its ability to sustain itself through a system of complex chemical reactions that continuously reproduces itself within its own borders. A peculiar feature in this process is the fact that, although countless metabolic transformations occur, the cell maintains itself and preserves its individuality. In this view, death is the disintegration of the autopoietic organization that characterizes life. If the essence of life is integration of various components, cells, and organs, when these mutual connections disappear, the system is no longer an integrated unit and death occurs.

Life is not the cell itself, but rather an emerging property from this complex circuit of ordered chemical reactions. Likewise, the economy is a vast entanglement of exchanges. It also transforms, self-organizes, and self-sustains through its "chemical reactions," or transactions. Depriving the economy of these connections for a long time can lead to the worst. The experiment of interrupting economic exchanges by paralyzing supply and putting demand on lockdown is unprecedented. We are not sure how the organism will behave, how it will come out the other side, or even when its vital signs will start to decline. We are certain that the experiment cannot last long.

Over the last twenty years, we have seen an increase in economic deregulation, specialization, and globalization. We are much more connected and interdependent, internally and externally. Modern economies today are a complex network of interconnected parts. Companies, employees, suppliers, consumers, financial intermediaries, all agents play more than one role. One day they are on one side, the next on the other. Each is an employee, customer or creditor of the other, and vice versa. A short circuit in one of these connections can trigger cascading events, and a rational decision at the individual level can become a collective catastrophe.

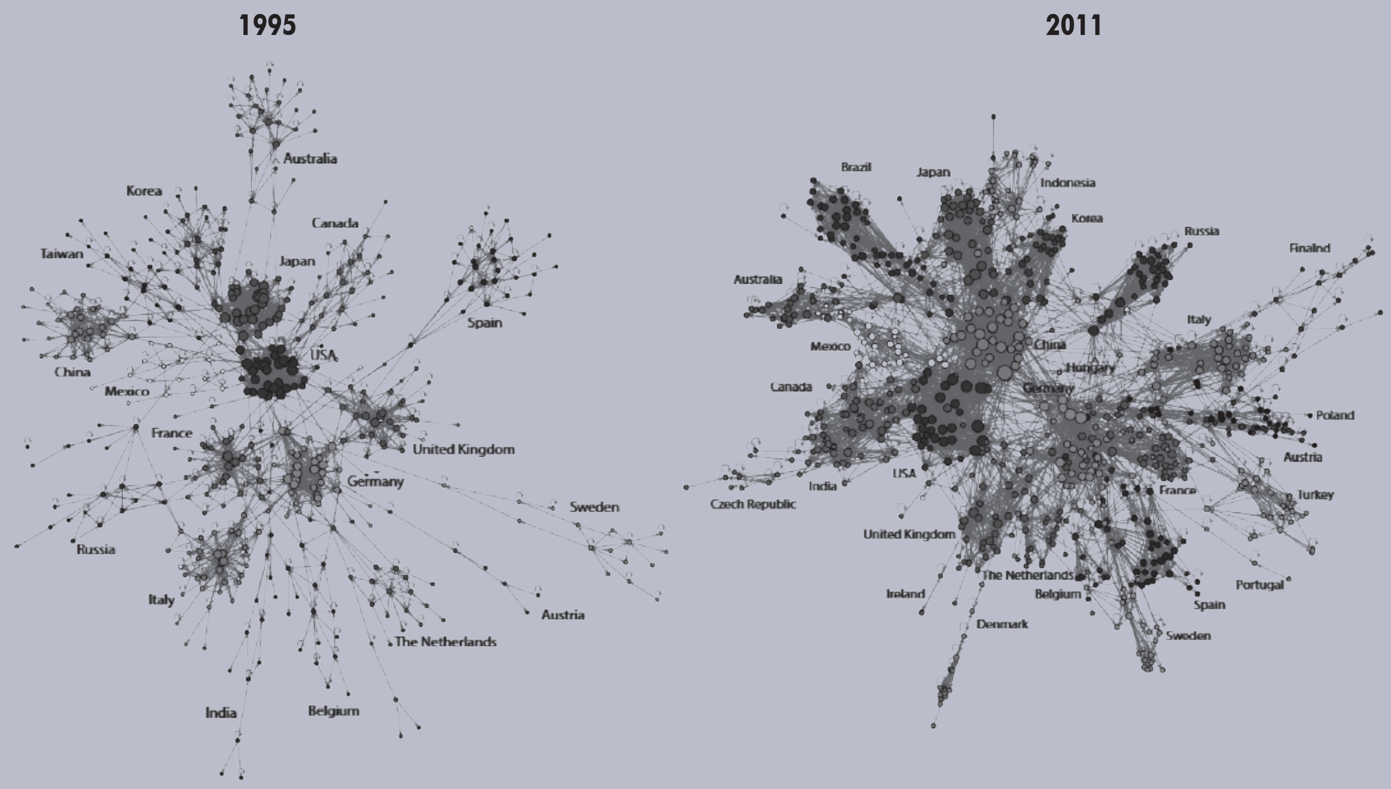
The production units are "leaner", the supply chains more just, and the consumer markets more accessible. Upload, outsourcing, offshoring. The prefixes reveal the trajectory. The world moves continuously, and the movement has been from the inside outwards. Technology has flooded companies and permeated their relations. Integrated management systems have synchronized suppliers at many levels and greatly shortened the lead time from production and product development to final sale. Stockpiles and spare parts have become synonymous with inefficiency and anachronism. This occurs in all sectors without exception, including in health, the adverse consequences of which we are now feeling. As they say in engineering, the world reached a tight coupling regime – when the components of a process are critically dependent, connected in such a way that there is no room for error, or time for course correction. Anglicisms are unavoidable, since language transformation can't keep up with the speed of business innovation.

Figure 2 represents an effort to construct a global input-output matrix, expressed in terms of network structure. The nodes represent the individual industries in different countries. The connections reflect the monetary flow of goods between industries. The two images, from 1995 and 2011 respectively, unequivocally reveal the significant increase in the relationship density in production chains in the global economy. Planisphere containing the evolution of cable distribution, submarines of optical networks, international flight routes or transoceanic cargo ships show similar evolutions, indicating the expressive growth in flows of information, passengers and goods around the world the past twenty-five years.

Given that some compare the repercussions of the Covid-19 shock in the economy to the effects of natural disasters, it's worth looking at an example of such an

1 *Proposed by Chilean scientists from the "Santiago School," Humberto Maturana and Francisco Varela.*

Figure 2



Source: Cerina, F. et al., 2015.

episode. In March 2011, Japan was devastated by the Tohoku earthquake, which registered an intensity of 9.0

on the Richter scale, causing serious damage to the coast and the interior of the country. One of the countless companies impacted was Renesas Eletronics, which at the time held 44% of the market share of global manufacturing of microcontrollers units (MCUs), one of the countless parts needed to build car automation systems. While electronic systems in cars are constantly increasing and each regular vehicle employs about fifty MCUs, the cost for manufacturing each unit is relatively low. Matsuo (2015) documents that due to the granularity of the automobile industry supply chain, a disruption in the production of a small component caused a decrease of more than 50% in the production of the main Japanese automotive manufacturers for as long as four months! A significant loss in giants like Toyota, Nissan, Honda, Mitsubishi, among others, literally because of a micro component.

This example illustrates the enormous coordination challenge within interconnected and extensive supply chains. We are talking about the Japanese automotive industry, a world reference for efficiency and effectiveness in a production system. The shutdown of a small circuit in this complex system can compromise an entire industry for a long time.

In April, 2020, the Central Bank of Brazil (BCB) published a new volume of the Report of Financial Stability that includes an interesting exercise for measuring the impacts of Covid-19 on the Brazilian economy. The BCB used a network interconnections methodology to estimate the shock intensity for several sectors using a detailed map of payment flows that takes into account the degree of interdependence among thousands of companies. The BCB's final objective was to estimate the magnitude of the potential increase in support for financial institutions, as well as the need for recurring regulatory capital. To this end, the BCB identified vulnerable sectors and the first order impact on companies directly affected by the shock. Analysists also estimated the second- and third-degree repercussions, including the effects on the employees of these companies, on the supply chain, on the employees of their suppliers, and on financial exposure. The estimated total amount needed to cover possible defaults and downgrades would be R $ 395 billion. More interesting for our argument, however, was the result of the division between the first-rate impact on companies directly affected (R $ 207.3 billion) and the sum effects propagated by the interconnections across the production chain (R $ 187.7 billion). That is, almost half of the total disturbance would be felt as reverberations in the transaction network, which illustrates yet again the enormous importance of these capillary, silent and less visible gears that sustain economic life.

Governments are aware of the magnitude of the problem. So much so that they mobilized quickly to announce unprecedented fiscal packages aimed at preserving savings while also seeking to diminish the impacts of the virus with social distancing. This was a timely initiative that helped the economy to survive, comparable to respirators in ICU units. In other words, this also amounts to flattening the convex curve of economic recession. Governments offer non-refundable transfers, working capital allowances, interest-free credit lines, benefit advances, and tax postponement. It was a significant fiscal effort made to keep companies from firing their workers, so that unemployed people and those who work in the informal economy can receive some support, and so the financial system can remain liquid and solvent.

Given the gravity of the situation, and the existence of a common external enemy with no identified interest group to blame, civil society supported the publicly-funded rescue plans. The vivid memory of the 2007/2008 crisis may have helped. There, governments took a long time to act, facing resistance from the electorate and taxpayers. When they did act, they were competent and contained the spread. The action took place in the more restricted banking sector where control, regulation, and the number of participants is reduced. Now, the response came faster, with less questioning, but in a broader scope of action. In the health sector, the participating agents are more dispersed and diversified. Regulatory bodies often divide responsibilities in specialized areas of activity. Execution is local and capillary. Even in Brazil, which has a more centrally structured public health system (SUS - Sistema Único de Saúde), there are several participating bodies at federal, state and municipal levels. Resources are managed at the national level, but enforcement is local and private hospitals and clinics also treat patients. This means numerous layers of complexity. Drawing parallels between the run on banks of the 2008 financial crisis and the run on hospitals of this crisis, the challenges in coordination and in effectiveness in the public agenda seem to have increased.

Even though everything may seem to follow the script for a classic bailout on the drawing board, in practice, unfortunately, it will still not be enough. First, because the fiscal effort is finite by definition. No government will be able to sustain it for very long. Second because it is an imperfect response that only emulates the monetary substitution of economic exchanges. Even the most efficient resource distribution mechanisms, which we do not have in Brazil, reach diverse agents and segments at different times. Nothing guarantees that the complex web of reactions of economic exchanges will be preserved. Nothing ensures that all the countless microcircuits of the production units will stay alive. Nothing guarantees that small shutdowns will not eventually cause a chain reaction. Nothing guarantees that when everything is rewired, it won't be damaged. The silent information system behind the fine-tuning mechanisms of productive chains is much more sophisticated than it looks. Well-intentioned governments pouring money into the economy may seem to be the only alternative public policy to be pursued at this point, but this is still a palliative experiment and an imperfect simulation. The risk of a rupture in the fine-tuning of the highly connected links of the productive system remains high, as well as the threat of triggering chain effects that could lead to the collapse of the economic system.

Complex situations require complex interventions. We cannot collapse all dimensions of causality by naming a single generating event as exclusively responsible for everything that happens, nor believe that the solution follows a prescription that reaches only one aspect of the situation. In complex phenomena, preexisting conditions amplify problems and second and third order effects propagate in an often-imperceptible way.

The enemy is opportunistic. It takes advantage of our biological equipment and our social facilities for its own expansionist benefit. We need to develop biochemical, social and economic resilience. This will only be done if we have an integrated understanding of the threat. We don't have time or space to fight ambiguities. At the moment, the defense of life is an indisputable priority. Avoiding economic collapse is also key to preventing acute and prolonged social tragedies.

This multidimensional agenda involves, in addition to the emergency mobilization of public and private resources for equipping the health system, coordinated management among the various organs and instances of government, serious and ethical science, universalized technology, civil conscience, and solidarity. Mass testing with verified kits and comprehensive social tracking allowed by the mass use of cell phones and smartphones will determine the duration and degree of social isolation. Where vulnerability and prevalence are high, isolation should be more restrictive. Where Rt is under control, vulnerability is lower, and tests indicate greater immunity, exit strategies could gradually be conducted, starting with the essential sectors. Under this more systemic view, the edges of ambivalence are trimmed. We must move forward more consistently, searching for a balance between the concave and convex.

Capital Markets and Fund Management

We are living in extraordinary times. Swimming through chronic uncertainty that confirms the following prognosis: each crisis arises differently than the previous one. On December 31, 2019, we celebrated a year of promising results in Brazil's capital markets. 2019 was a season of notable achievements including the historic fall of interest rates, domestic inflation, and private sector crowd-in, as well as a series of promising reforms, including projects to improve the business environment, which had been suffering. The western world showed signs of slowing, but the projection of growth in global GDP was still reasonable, on the order of 2%, with Chinese rail stock pointing to nearly 6%. The consensus around the prognostics for the capital markets was of yet another year of appreciation, fattening the generous returns embedded in equity risk premiums. Accustomed to the "premium," investors tend to forget that the market comes to charge the claim every once in a while.

It's a fact that some warnings were coming from more cautious voices. There were anxieties about the unprecedented experiment of interest rates in such unfamiliar territories, complacent investors accepting asymmetrical risks, uncertainties around the American elections, doubts about the sustainability of Chinese growth, and geopolitical risks bubbling up here and there. These uncertainties are part of a conventional risk map, a playbook that we didn't calibrate to perceive the pending microscopic tsunami. No one imagined that underneath this benign landscape, intracellular parasites conspired to deliver a hard blow to their imminent hosts.

Since then, what have we seen? More than six million infected individuals, and more than 350 thousand deaths in over 200 countries. Governments decree states of public emergency, prohibit movement, freeze cities and economies, stop industries, businesses, and services. An unprecedented supply shock combined with a never-before-seen lockdown on demand. Records abound, including the most substantial projected contraction for a trimester GDP, in some countries expected to reach double digits, the largest ever package of fiscal incentives, 20% of the American workforce applying for unemployment, and historic market collapse. In the S&P 500, we witnessed the third largest drop in a day (-11.98%, 16.mar), the worst week since October 2008 (16-20 mar, -14.98%), the activation of four circuit breakers in less than ten days (9, 12, 16 and 18.mar), and the worst first trading day of a semester (April 01, -4.44%). If stock market returns were distributed in a normal curve, which we know they are not, the drop of 19.6% in the S&P 500 in the trimester would be a 6-sigma event, statistically expected every few tens of millions of years. As rare as a black swan with blue eyes and yellow beak.

Capital markets are thermometers for the economy and reflections of our psychology. They take agents' temperatures and reflect individual and collective behavior. In crises, individuals are overcome with fear and adopt defensive behaviors. In acute crises, people experience panic and become irrational. Fear speeds up one's heartbeat and breathing, and when individuals feel panic, they run. They run to stock up on groceries and fuels, masks and hand sanitizer, run to withdraw money from banks, run to sell securities and make cash.

In previous crises, the uncertainty was generally financial and economic. Liquidity or solvency problems, excess leverage, macroeconomic imbalances, bubbles in certain asset classes. Economic and financial crises cause anxiety by destroying assets, income, and employment. The current crisis is a health crisis and lives are at risk. There is a lot to lose in financial crises. In health crises, there is everything to lose. A health crisis takes psychological uncertainty to another level and intensifies its effects. The rapid speed of unprecedented decline in the markets leaves people perplexed facing such unknown scenarios. Neuroscience studies typically report three situations that put people on alert and trigger massive psychological stress responses. They include novelty, uncertainty, and lack of control. Could we find more suitable expressions to define what we are facing today?

The crisis has been unexpected and inhospitable, also setting records in the velocity of partial recovery of the markets. In the two months since the lowest point (March 23), the S&P 500 appreciated 28.0% (in dollars), the Ibovespa 24.5%, and the Dynamo Cougar 34.2% (both in nominal reais). While economists discuss the shape of the economic recovery curve and value investors try to form opinions on the duration of shelter in place orders, the effectiveness of proposed solutions and strategies, and whether or not there will be a second wave of infection, "Mr. Market" has decided to credit himself a few hundred points. The main question now is what explains the rapid recuperation, uncommon for such a short space and time. Is it: (i) a technical recovery, merely adjusting to overreaction early on; (ii) a fundamental resumption, based on the understanding that the crisis will last for a limited time and looking through a long-term perspective, there is value on the table; (iii) essentially, an speculative rebound, where investors seek to anticipate the psychology of the rest by buying ahead. Based on these projections, the partial recovery of the markets should have been adequate, timid, or excessive? That is *the* question everyone is asking, but no one has a response. Many experienced people are still in doubt, which is yet another reflection of these times of radical uncertainty.

A crisis with such atypical contours – specific in origin and unprecedented in reach – brings particular concerns and challenges to asset managers and investors. As public health took the wheel putting the economy in the passenger seat, we worked on gathering collective efforts to understand the "leading indicator" of the crisis: the virus and its dynamic, the epidemiology. In the previous Report, we tried to synthesize this journey, which by the way, is very far outside our area of expertise.

We had the opportunity to share with our investors, in a separate note, the details of our portfolio management, together with a self-criticism analysis of the Fund's performance to date. We recognize that the audience of our Reports is more general and have broader interests. Still, we think it makes sense to briefly expose the way in which we are designing the priorities of our research job these days, sharing some reflections that situate the repercussions of the crisis in the more granular environment of some businesses and companies.

Since we realized the seriousness of the situation, we were immersed in an analysis task force that can be broken down into three major vectors. In the first, we examined the companies´ need for cash outflow in our portfolio, assessing their financial and more general obligations. With this information, we immediately started the second phase of the work, where we analyzed operational activities, in daily contact with the companies, carrying out stress tests, trying to factor the short-term impact on results mainly for this calendar year. Here, it is worth registering, we found invariably solicitous interlocutors, who showed agility, transparency and competence to meet our demands in times of recognized operative limitations. This help has been instrumental for achieving our purposes. Finally, in the third dimension of analysis, we seek to infer the long-term repercussions of this crisis, whose peculiar dynamic will have relevant and definitive implications in diverse segments and business models.

The first task was a rigorous effort to collect quantitative information, which required a degree of discipline and focus to make a risk map as quickly and as reliably as possible. We wore the credit obsessed analyst's hat, investigating each line of credit, of working capital, contract and debt, observing profiles, maturities, covenants, subordinations and conversions, and building a detailed map of the liquidity situation of each investment. To use the metaphor of the day, in this first moment we submitted all the companies in the portfolio to a rigorous, gold-standard RT-PCR RNA extraction test to detect the presence of the virus with extreme sensitivity. Our investors know well that even at times when market valuations seem more stretched, we stick to our principles and never consider dubious investment propositions. That is, we maintained our historic "restricted entrance" policy that guarantees that our portfolio will invariably be filled with good quality companies. In these moments of ambiguity, we see that our rigor around who we do and don't let into our club works, and we didn't find material solvency risk or major liquidity problems among our investments. The most leveraged companies in the portfolio, the "risk group," have good cash situation, a long-term debt profile and many options of marketable assets.

The second task requires more specific knowledge of each company, aiming to understand and translate the effects of the crisis as quantitative variations of the various operations performance metrics. These are the well-known stress tests. The more granular the team's knowledge of the company and its segment, the more accurate the test. Depending on the different possibilities for the duration of the lockdown, the period of gradual relaxation, the intermittent nature of the disease, the particular response of each business sector, we ask ourselves about the impacts in terms of revenue and operating results on each of our investments. Unfortunately, as we have already mentioned, there are countless unresolved questions about the dynamics and interaction between the two enigmatic curves. Based on conversations with the companies, on our analysis of the eventual impacts of emergency measures proposed by the government, and on evidence from the countries ahead of Brazil that have begun to test a gradual exit, we were able to create a model of probable impact. In other words, using the metaphor again, we submitted all the businesses in our portfolio a sensitive test that would detect the presence of antibodies, both the rapid (IgA/IgM) and the long term (IgG) immune responses.

Here, we were able to see a reasonable amplitude in the degree of short term "immunity" in our portfolio. Companies whose work includes the physical delivery of goods and services – consumer goods (**Natura**), retail (**Renner**), and shopping centers (**BrMalls**) – will have a hard year. Others will suffer less due to their privileged competitive position (**B3**), the long term nature of their contracts (**Eneva**), the quality of their strategic assets (**Vale**), the diversification of their investments (**Cosan**), the ability to occupy space left by more fragile competitors (**Localiza**), their differentiated value proposition for clients (**XP**), or a business ecosystem prepared to capture the benefits of the present transformations (**Mercado Livre**).

If all stocks suffered in similar intensities at the beginning of the crisis, in a second phase, investors became more selective. We can observe disparities among the recovery dynamics of some stocks, although daily volatility is still high. This brought opportunity for adjustments. We carried out a reasonable portfolio rotation, reducing or eliminating some investments and increasing others.

The third pillar of our efforts has been trying to assess the more definitive impacts of the crisis on the business models of each company. A privilege of long-term investors is that we can take our eyes off the ground and calibrate a longer-term vision. In fact, the crisis can accelerate trends and catalyze behavior patterns. Some quick thoughts to illustrate this point:

- Working from home, we having more virtual meetings than ever before. What will be the future of commuting for professional appointments? Does it make any sense to waste time and energy navigating chaotic traffic in urban centers? We know that an important source of revenue for Brazilian airlines are flights between Rio and São Paulo, which mostly shuttle people for professional engagements.
- Will we have more meals at home? What will happen to bars and restaurants? Will people go to gyms or exercises in public areas, at home, or in their condominium?
- Will we shop in physical stores, through direct selling, or online? How will be the frequency of customers in shopping malls? And in bank branches?
- Health care providers have experienced a significant drop in requests for consultations and tests, given the fear of contagion in clinics and hospitals. This appears to be good news in the short term, though it is important to remember that highest insurance claims are for surgeries and hospitalizations. There is fear that after the epidemic, the pent-up demand will return and join the demand of a significant number of patients with after-effects from Covid who require special care. How much will telemedicine accelerate?
- Education is another sector at the epicenter of change. How much will this forced experiment of online classes, that reached even elementary school, will dilute the resistance to distance learning?

This is just a small sample of our challenge. These and many other issues were already present and will continue to figure prominently in our daily analyses moving forward. The world will emerge from Covid-19 changed. Trends that were brewing are likely to accelerate. Three of those sketches are now much more well defined: an environment with more debt , less globalized, and more digital. Seismic shocks in the competitive landscape test companies' adaptive capacity. We need to select investments that will be able to navigate this changed ecosystem. Continuing the metaphor, the challenge becomes identifying which companies are on the way to developing lasting immunity (IgG above the cut off).

There are no easy solutions or pre-determined formulas. Nevertheless, we have some conviction that the quality of management is a good indicator of who will make it to the other side. Differentiated assets are important, but ability to adapt is essential. History of our planet teaches us that waves of "innovation" have followed significant cataclysmic events. The species selected have a more comprehensive set of skills in their DNA that allow them to adapt, rather than depending on a specific niche and remaining vulnerable to devastation. Quality management represents exactly this genetic framing. Companies with inspiring executives who think strategically and outside the box, anticipating the trends and taking risks when needed, take advantage of these moments of course correction to leap ahead. In a country like Brazil, with some oligopolized and protected sectors, and others still fragmented with unsophisticated and fragile participants, there can be considerable payoffs.

Those who can minimally preserve their production chain and have a stable financial position and agility to move through the post-crisis moment will be able to take advantage of incredible opportunities. The competitive advantage of quality companies should increase. As evolving systems, economies imitate biology. If a key to sustaining life is the preservation of a system of chemical reactions, an indicator of the health of companies is their ability to preserve a network of vital exchanges. We have seen significant differences in the responses of companies to these challenging times. Some, in a survival mindset, canceled contracts, cited force majeure clauses and abandoned suppliers. Maybe they had no alternative. Perhaps they acted too soon and ran in the wrong direction, going to the center of the tornado. On another extreme, we are aware of companies that use the competitive advantage of leadership in their markets and their robust balance sheets to reinforce strategic connections with suppliers and clients. We have no doubts that the recovery for this privileged group of companies will be virtuous.

Regarding medium to long term evaluations, considerations about the macroeconomic environment in Brazil will be pertinent. Some concerns emerge here. Those achievements of the recent past, upon which the market sustained favorable expectations, are no longer so obvious. The huge fiscal effort to deal with the paralyzation of the economy during confinement represents a radical sidestep in the orientation of public policy discipline and can inaugurate a season of apprehensions: a trajectory of rising debt to GDP ratio, liquidity in the system together with a supply shock bringing on inflation, and maybe a need to raise interest rates, not to mention a return to populist proposals and assistentialist nostalgia in Congress. Based on our best predictions, the exchange rate should reach its equilibrium at a level above what we thought in the past. The impacted companies will have to make an extra effort to adjust. More recently, disturbances in governance in Brasilia caused significant turnover in the Executive Cabinet, which contributed to increasing uncertainty at a time when the country most needs more institutional stability and focused policy. As we have always said, the macro aspect is subsidiary in our investment process, where our core attention is turned into the companies and their businesses. However, any setback in these macro political achievements would certainly delay economic recovery, causing a significant impact in our portfolio.

This is a particularly challenging moment. We are confronting new realities that bring an elevated level of uncertainty. But we are not lost in the dark. We are confident in our analysis and in the principles that will guide us through this thick cloud. They are discipline, focus, dedication, humility, diligence, integrity, serenity, intellectual honesty, long-term perspective. We will not engage in experiments or pursue false opportunities. We are calibrating our instruments to incorporate our learning as we navigate. We are convinced that at the end of this storm, we will have an even more robust portfolio ready to benefit from a horizon of opportunities.

With the advances in discoveries in the areas of cognitive and social psychology in the last fifty years, we have a much deeper understanding of judgment and decision-making processes. We know that individuals tend to automate routine tasks in order to free up scarce cognitive resources for activities that require greater reasoning. This is a continuous specialization between Systems 1 and 2 thinking, classically described by Daniel Kahneman. Collectively, societies also advance by incorporating cognitive shortcuts, saving scarce mental resources by assuming that many everyday variables should be treated as data that should not be constantly questioned (cf. Krakauer, 2020). In fact, these heuristics and rulebooks usually work with reasonable accuracy, under normal temperature and pressure, that is, when there is stability in the ecosystem. When the environment changes, these judgments and their derived behaviors may prove ill-adapted. Perhaps we are experiencing one of these transformational moments that demands us to reset our operating system in order to rethink new ways of navigating different realms. These are transition phases that may require a good dose of everyone's adaptive effort including people, companies, governments, and civil society. Such circumstances usually accelerate the process of "creative destruction," in addition to causing a quantum leap in innovation.

Chinese medicine has a holistic view of diseases, associating pathologies to states of the soul. It is a philosophical, unscientific approach to western patterns, deeply rooted in an ancient therapeutic practice. In this context, the understanding is that diseases in the lungs have their origins in sadness. Seen this way, the world affected by Covid-19 would be sick because it is sad and sad because it is sick. In the Eastern tradition, diseases are expressions that something needs to change. The path to restoring the balance of vital energy is a process which requires changes in environments, thoughts, habits and customs.

One of the transformations that has been taking place is a turn toward systematic thinking. We see ourselves becoming more connected and taking advantage of specializations found in every corner. Significant benefits have been achieved, including the millions of disadvantaged who have come out of poverty. On the other hand, negative externalities and unintended consequences emerge for which no-one claims authorship. Benefits inside the walls, costs outside. Environmental issues have also become more acute. It is said that insome regions of China, with complete shutdown industries, the drop in the number of deaths caused by respiratory issues linked to pollution was greater than the increase in deaths caused by Covid. When the disaster "saves" lives, it is a sign that we have reached an unsustainable threshold. Excesses aside, one would imagine that with the pandemic, environmental issues, whose impacts are only felt along the time, would stay in the background. That does not seem to have been the case.

One piece of evidence for this is the behavior of ESG investments throughout the year. As we know, ESG is an acronym used to characterize assets that observe differential environmental, social, and governance criteria. They are associated with investments classed as sustainable, responsible, and ethical. During the pandemic, the ESG asset class has performed better than most others, recording a positive influx of resources. There is a clear message here: investors understand that severe and unexpected problems will continue to arise in the external environment. Companies who have formed a culture and incorporated some experience, developing a mentality of respect for environmental, social, and governance questions, will be better prepared to confront these challenges.

Tragedy mobilizes the country. The virus advances, making us run desperately against the clock. And time

Dynamo Cougar x IBX x Ibovespa Performance up to April 2020 (in R$)

Period	Dynamo Cougar	IBX	Ibovespa
60 months	94.9%	47.1%	43.2%
36 months	49.0%	25.8%	23.1%
24 months	29.4%	-4.1%	-6.5%
12 months	6.2%	-15.1%	-16.5%
Year to date	-23.9%	-30.1%	-30.4%

NAV/Share on April 30 = R$ 1,012.562469600

DYNAMO COUGAR x IBOVESPA
(Performance – Percentage Change in US$ dollars)

Period	DYNAMO COUGAR* Year	DYNAMO COUGAR* Since Sep 1, 1993	IBOVESPA** Year	IBOVESPA** 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%

2019	DYNAMO COUGAR* Month	DYNAMO COUGAR* Year	IBOVESPA** Month	IBOVESPA** Year
JAN	-0.1%	-0.1%	-7.1%	-7.1%
FEB	-13.0%	-13.0%	-13.1%	-19.3%
MAR	-41.2%	-48.9%	-39.3%	-51.0%
APR	10.6%	-43.5%	5.6%	-48.3%

Average Net Asset Value for Dynamo Cougar
(Last 12 months): R$ 4,076,547,460

(*) The Dynamo Cougar Fund figures are audited by Price Waterhouse and Coopers and returns net of all costs and fees, except for Adjustment of Performance Fee, if due.

(**) Ibovespa closing.

has collapsed the historical ills of our dysfunctional society into the present. In this case, we recruit emergency strength and keep trying to avoid the worst. The country still sees brutal statistics: about fifty thousand homicides/year, thirty thousand deaths in traffic accidents/year, the vast majority due to recklessness and/or negligence, eleven thousand deaths per year attributed to lack of basic sanitary conditions. For the purposes of planning, the public health system (SUS) in Brazil works with the concept of "preventable deaths," defined as those deaths that would be "totally or partially preventable through effective health system interventions that are accessible in a particular location and time." The most recent aggregate data for the country estimates that the "preventable deaths" in 2017 would have reached six hundred thousand people! That is, we experience multiple Covids outbreaks every year that go unnoticed through the veil of social incompetence and personal indifference. Brazil disregards life by default.

This moment of deep distress needs to leave a permanent legacy. Man is essentially a being who forgets. This is an important alert. We need to build mechanisms to deal with the malfunctions of our nature. Collective engagement seems to be the way forward. Solidarity comes from the Latin word meaning solid, whole, firm, complete. Exercising solidarity implies committing to something greater, seeking to solidify and consolidate. Our hope is that we can translate the acute pain of the present into solid purpose for a lasting future.

Rio de Janeiro, May 18, 2020.

Please visit our website if you would like to compare the performance of Dynamo funds to other indices:

www.dynamo.com.br

DYNAMO

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