Report
DYNAMO 101
1/4 2019

Negative Interest Rates 101

Since 2009, our investors have been receiving a separate report at the end of each quarter called Comments on Our Performance, where we discuss some routine topics of the Fund's investments and portfolio management. With this, we gained some liberty to address more open topics in the Dynamo Reports. Having reached the milestone of 100 editions, we continue with the same aim of producing at least four Reports per year. With this one, we begin a sequence of publications where we intend to present shorter texts that are lighter reads. They will be like shared notes or reflections on a topic of concern. At such point, we will articulate more questions than answers, which we intend to share with our readers, maintaining the tradition of this dialogue that is so important and fruitful to us.

We are starting this new phase with one of today's enigmas: the reality of negative interest rates throughout the western world. We are going to leave academic rigor aside, especially since many qualified people still have not been able to figure out this puzzle. It is an ongoing experiment whose unfolding repercussions do not present definitive conclusions. Distinct opinions emerge on both sides of the debate, and even within Dynamo, we haven't reached consensus on the subject. Still, we think it is valid to publish a draft of these dispersed notes.[1]

The facts

In July of 2012, the Danmarks Nationalbank (DNB) reduced the interest rate on bank deposit certificates to -0.20%. In this unprecedented event in the bank's 200-year history, DNB counterparts began paying to deposit their savings in the institution. In June of 2014, the European Central Bank (ECB) set an interest rate of -0.10%. In the same year, it was the Swiss National Bank's (SNB's) turn at -0.25%, followed in 2015 by Sveriges Riksbank, in 2016 by the Bank of Japan (both at -0.10%) and by the Hungarian National Bank (-0.05%).

Today, an estimated 20% of the world's sovereign bonds, or around US$12.5 trillion, "yield" negative nominal interest rates. And it is not a restricted phenomenon of short term deposits. We see negative interest rates on ten-year bonds in many countries in the eurozone and even in Switzerland's 30-year bond! We have seen real negative interest rates in the past, generally around inflationary surges. Such widespread nominal negative interest rates, however, have no historical precedents.

The circumstance has also reached the universe of corporate bonds. Louis Vuitton (LMVH), for example, issued two-year notes yielding -0.17% p.a. The demand was six-times higher than the issue. In other words, five out of six investors left frustrated because they were not able to pay to loan capital to the company — a real luxury.[2] There is more. As we write these lines, a Petrobras bond in Euros, which matures in 2021, has reached the negative territory. In 2016, this same bond traded at a 14% yield.

The basics of interest-rates

Interest is a critical concept in economics. A complex phenomenon that has received much attention and

1 *Given the density of the topic, we sought information in specialized texts, some of which are mentioned in the Report. As is customary, the full references can be found on our site: www.dynamo.com.br in the Library section.*

2 *To be fair, these notes negotiate at a slightly more negative rate today. With this, the investors who bought at issue are earning money. A sign of the times.*

debate, interest has countless interpretations, including as production cost, monetary value, time preference, and as a reward for forgoing liquidity. It takes on different forms: natural, neutral, market, equilibrium, real, nominal, short or long-term rates, and the list goes on. But no definition is more persuasive or intuitive than the understanding of interest as a rate of time preference. Interest is the financial reward for giving up consumption in the present. It is a remuneration for parsimony, a payslip for patience. At the other extreme, interest is the price paid for anticipating consumption, the cost of need, the discount for impatience.

Deciding whether to save or to consume involves an intertemporal trade-off. Similarly, production happens in time. Interest rates determine how much we should consume today or how long the production process should last. The more we prefer present consumption, the higher the interest rate should be. At the extreme, individuals whose basic needs are not satisfied cannot give themselves the luxury of giving up present consumption. Survival, now, and "infinite" interest, we could say. In other words, the higher the interest rate, the more discounted becomes the future, the lower the present value of what happens later. On the other hand, in an environment of prosperity, consumption can be more easily pushed ahead without the demand for hefty sacrifices. Low interest rates, sure. The lower the rate, the lower the relative weight of the present, and the higher the present value of the future.

Interest is the economic component of the more widespread phenomenon of inter-temporal exchanges happening across diverse realities. Where present abstention is required to obtain a future benefit, the temporal transactions are on positive terms. This concept is so ingrained that savings and investment have become synonymous with virtue. Physical and mental health, instruction and wisdom, affective capacity and financial prosperity, are all long-term constructions secured through patient temporal exchanges. This trend holds even for more common objectives. In a chess game, for example, there is a strategy called a gambit wherein you sacrifice a piece, a pawn let's say, to gain some advantage down the line or conquer another piece with a higher value, say, a knight. In chess, the difference in value between the knight and the pawn can be considered the interest rate of the gambit, the merit of a patient player.

In diverse situations, positive temporal exchanges underscore constant progress. In pedagogy, empirical studies suggest the efficacy of exercises of delayed gratification in infancy. Impatient babies, children and adolescents have higher chances of becoming anxious adults. In economics, the accumulation of capital and knowledge (technological progress) usually precede periods of development. In evolutionary biology, they say that the transition from Neanderthal to homo sapiens happened because of the expansion of the brain, notedly of the pre-frontal cortex, the region that is responsible for patient behavior (Haldane, 2015).

Negative interest, justified

In an environment of negative interest rates, the temporal preference is inverted. Saving is penalized. Avoiding consumption in the present becomes a bad deal. The future collapses into the present, and the incentive is to act like there is no tomorrow. Patience becomes dehydrated. How can we reconcile such a bizarre thing? Why are the central banks of developed countries following such a counterintuitive logic, challenging a premise of cognitive ordering and a pillar of civilizational progress?

Central banks are the guardians of currency. Their primary objectives include guaranteeing price stability and promoting a secure financial environment. In practice, they also sense that they received a mandate from society to support employment levels and avoid recessions. They have few instruments at hand for pursuing such noble objectives. Their primary tool is monetary policy, whose limits they have been testing to exhaustion. Negative interest rates arise in this context, out of limited options in the monetary authorities' toolbox.

Central banks view economic reality through a macro lens. They are concerned with the behavior of domestic product, employment, and inflation. Individual desires, preferences, purposes, and conducts do not deserve individualized investigation since they manifest in aggregate quantities. Through this systemic perspective, such aggregates are trustworthy syntheses, which can be examined and manipulated through econometric experiments. Interest rates that reflect subjective perceptions and individual psychological preferences do not matter much. Interest rates are public policy tools that

move the aggregates in the desired directions through "transmission mechanisms". It is quite hard to find the term "time preference" referenced in the official documents of central banks. The idea of pushing basic interest toward negative territory is a way to encourage the banking system to loan more and direct resources to investments, stimulating the economy, eventually taking it out of a recessive trajectory and avoiding price deflation. In some cases, like that of the Danmarks Nationalbank and the Swiss Riksbank, the arguments reveal even more circumspect objectives: the interest rates became negative as a way to maintain a regime of fixed exchange rates and avoid the threat of currency valuation against the Euro… (Jorgensen e Risbjerg, 2012).

In summary, the main justifications that central banks and the IMF use to advance a regime of negative nominal interest rates are: (i) continual decline in global growth and spending; (ii) decline in the global population growth rate and the tendency toward aging, reducing spending and squeezing investment further; (iii) growth of inequality, which includes an increase in global savings, since the rich save more and the poor are not able to invest enough in education, which leads to less accumulation of human capital; (iv) an increase in the savings glut, especially in emerging countries, led by China[3]; (v) reduction in the investment/GDP relationship in developed countries due to declining returns on investment and lower public investment growth.

In this context, negative interest rate policy (NIRP) arises as an almost inevitable unfolding from the "secular" trend of falling interest rates, explained by the elements mentioned above. With rates going below zero, however, preserving capital in paper money starts to make economic sense. Keeping cash under the good old mattress, as the saying goes, begins competing with the central banks and becomes an object of concern of the staunchest defenders of NIRP. The question of hoarding gained surprising relevance in technical discussions. The topic became so significant that, in 2016, the ECB decided to no longer print 500 Euro bills. The official pretext was to combat terrorism and fiscal fraud. Between the lines, everyone knew that the real reason was an aim to reduce the competitiveness of saving cash. It is no surprise that the sales of safe deposit boxes spiked in Switzerland, just as had happened in Japan. The central banks' efforts reveal their concerns. Empirical evidences show that traditional channels of monetary policy don't work the same way in the negative environment (Eggertsson et al., 2019).

Results

An analysis of the results of the NIRP up to this point suggests that monetary easing did not achieve the desired recovery of growth. Even though some defend that "we avoided the worst", meaning a sharper recession or even a depression, this is a counterfactual proposition. The reality is that economies did not react or at least when they did, they did so anemically. On the other hand, to compensate for the lower risk premium, the agents in general have taken on more risk (ECB, 2018). An increase in duration risk, credit risk, liquidity risk, and higher exposure to riskier asset classes can all be verified (JPMorgan, 2018). If, on the one hand, the growing adoption of NIRP did not provoke a market collapse, there is evidence that the average profitability of banks in the eurozone has been falling and the health of financial institutions is a source of concern. There are also no signs of rising inflation, so concerns about a general deflationary price tendency cannot be ruled out.

The impact on non-bank financial institutions also deserves attention. A relevant number of life insurance plans in the eurozone offers some guarantee not connected to the interest-rate market. On the other hand, these insurance company reserves are invested in sovereign bonds, negotiating in the negative territory. Either such insurance companies will have to reinvent themselves, begin a new phase of consolidation, or they will have to increase their exposure to riskier assets.

The public sector took advantage of the low interest rate environment to increase the average term of debt maturities, which is good news. On the other hand, it raises the issue of moral hazard among high-spending governments. Considering the well-known political

3 *As an empirical observation, we also recall the tendency in the last two decades of sophistication in the management of these savings, with the rise and/or dissemination of sovereign funds, asset management businesses, endowments, family offices, as well as the greater diversity of investment funds and stock classes available. This larger institutional organization oriented toward the search for greater returns contributes further to the increase in the stock of available savings, for any given interest rate level.*

resistance that contractionary fiscal reforms spark, a reduction in the cost of debt can lead to accommodation on the fiscal front. Besides, negative interest rates impose a transfer of wealth from the net saving private sector to the net spending public sector, decreasing the quality of the average capital allocation in the economies. It is curious that some officers of the central banks express concern about the significant levels of debt in the public sector, something they stimulated in the past and that created a kind of trap seen in the current situation, where rates cannot be increased without making the service of such colossal debts unsustainable.

Given the unprecedented monetary stimulus and expansion, the corresponding anemic growth in GDPs is indeed an eloquent result. While the central banks try to decipher this conundrum, the effects seem less surprising to those who prefer to calibrate their analytical lenses in the microcosms of the decision-making processes of individuals and companies.

Let's imagine Klaus, a 50-year-old German citizen – by the way, the age bracket that concentrates the largest band of the population pyramid in the Country. Klaus has been working since he was 25 and plans to work for another 15 years. After he retires, he will have 17 more years to enjoy his grandchildren according to the country's life expectancy. Knowing the cyclical nature of life, Klaus calibrated his expenditures, budgeting for an income of around 1.75% on his savings, according to the historical average. The times have changed, and, from now on, the Bundesbank will start to charge 0.25% per year for Klaus' commercial bank to have the privilege of depositing its money in its safes. What is the effect? Simple arithmetic and reasonable assumptions show that Klaus should count on a reduction of between 20% and 25% of his annual expenditures in his 17 years of retirement. Should he stubbornly decide to maintain the same level of spending in the new paradigm of negative interest, he will only have money for 13 years. In the last four years of his life, Klaus will have to depend on favors from family, society, or, who knows, from the government. In this context, understanding the effects of the new reality of negative interest rates over his remaining expected lifetime, what sane person would assume that Klaus would run to the Hugo Boss store or a BMW dealer? The message that Bundesbank put forth is clear: "Klaus, the world is more uncertain for you. Even so, we hope that you will go shopping, move the economy, and take responsibility for a severe recession off our backs."

Collateral impacts

The vision of the economy as a complex reality is not a simple metaphor or a type of intellectual appeal. It is an understanding based on significant reflection, empirical evidence, and experience. In this context, decisions and initiatives that transit through the social fabric activate new connections and establish patterns of unsuspecting interactions. As a result, they produce non-intentional collateral effects in the medium and long term. The Bundesbank-Klaus dilemma is an example. The proposition of using macro levers to inject capital and direct the economy, when moving through the filter of individual psychology, can produce opposite behaviors to those initially desired. Mapping out all the possible repercussions of the social experiments seems pretentious. Clinging to a specific world view, believing in the potential of a single analytical tool is the best way to guarantee surprises down the line. In the economy and in the markets, the infinite possibilities of interactions and independent responses of the agents pave the way for a non-linear dynamic that produces unexpected results.

In 2004, the then member of the Fed governor's council, Ben Bernake, made a famous speech with the title "The Great Moderation". The expression was coined two years earlier and reflected the awareness that macroeconomic mainstream had domesticated economic cycles to a certain extent. Bernanke began his speech in the following way: "One of the most surprising aspects of the economic landscape over the last 20 or so years has been the substantial decline in macroeconomic volatility". And following that, he described the reasons why this critical achievement was possible, emphasizing better quality monetary policy. Just over three years later, an unprecedented global financial crisis exploded, imposing a decline in the domestic product of practically all OCDE countries. Under the apparent calm of the macro aggregates, accentuated micro distortions were being formed, and eventually were manifested with tsunamic intensity.

Bernanke took care in his speech to attribute some responsibility for the Moderation's success to "good luck", reflected in the absence of adverse shocks of a

greater magnitude during the period. He recognized, in this way, at least some role for the imponderable. After the crisis, the central banks coordinated a rapid response to avoid an even longer collapse in the global economies. The general sensation was that the measure was successful. Since then, a succession of waves of quantitative easing has been implemented as an emergency policy, bringing us to the realm of negative interest rates. This seems to reflect a new chapter of policymakers testing the improbable limits of monetary policy instruments. Are we destined to depend on good luck once again? Where is the recognition that we are dealing with shifting landscapes, non-linear interactions, complex phenomena, which are self-organized in a critical form, and ripe for producing non-anticipated collateral effects?

How does all of this affect us?

There is no doubt that we are facing a scenario where investors are being compelled to take on more risk. Being pressured in the "risk-free" notes, they will have to seek out income in other riskier asset classes. Stocks are natural candidates. Besides, lower interest rates mean lower discount rates, lowering the threshold of minimum return on new capital allocation projects and also reducing the cost of debt for businesses. In other words, they change fundamentals that help to justify more elevated prices. As always happens in these moments, we are bound to witness the arrival of "tourists" in the market. People who are not from the métier, passing by, usually distracted optimists. Bubbles may form. Atypical patterns will emerge. Creditors paying to lend money, startups raising money without limit, public offerings several times oversubscribed, risk perception indicators inert, vertiginous growth in trading volumes, brokers updating (upgrading) recommendations, investors insensitive to quarterly results, or frenetically climbing up the ladder of financial statements to accommodate "reasonable" valuation multiples: from cash earnings, to ebitda, and even reaching gross revenues in certain cases.

Some affirm that value investors are becoming outdated, losing their ground to the growth enthusiasts. The trend is growth, not value. But to us, there is no dichotomy. So long as there is value in growth. We recognize the growth dynamics in businesses with increasing returns, network effects, and winner-takes-all effects. Perhaps a higher interest rate environment would have made the lives of high growth tech companies a bit tougher. But they would still be there anyway. The dynamics of the new paradigm are so virtuous that it wouldn't be intimidated by a higher cost of money. We will keep trusting in value as the backing to our investments. Even in companies that grow rapidly, invest a lot, and exchange profits today for better competitive positioning in the future. We are comfortable with gambit strategies if we recognize advantageous trades in the several future moves.

An environment less sensitive to risk is ripe for the proliferation of psychological traps that can come disguised in many forms: (i) false justifications: "this time it is different"; (ii) the institutional imperative of needing to "play the game"; or (iii) the opportunistic pretension to "ride the wave and get out just ahead". A higher leeway regarding less certain assumptions or even those "adjustments" to financial figures to accommodate stretched valuations may also emerge. Maintaining discipline, with focus on research depth, concern with capital preservation, and respect for the concept of margin for safety, are usually effective antidotes, even if they feel bitter at first, since we could become dislocated in this more cheerful market. A call for patience – here it comes once again.

At the same time, there is no avoiding the recognition that, different from the main economies abroad, where a long period of expansionist policies

Dynamo Cougar x IBX x Ibovespa Performance up to July 2019 (in R$)

Period	Dynamo Cougar	IBX	Ibovespa
60 months	143,4%	86,2%	82,4%
36 months	70,1%	79,6%	77,7%
24 months	54,4%	55,7%	54,5%
12 months	42,3%	30,9%	28,5%
Year to date	31,2%	16,9%	15,8%

NAV/Share on July 31 = R$ 1.094,406629100

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	DYNAMO COUGAR* Month	DYNAMO COUGAR* Year	IBOVESPA** Month	IBOVESPA** Year
JAN	17.2%	17.2%	17.6%	17.6%
FEB	-1.7%	15.2%	-4.1%	12.7%
MAR	-3.1%	11.7%	-4.2%	8.0%
ABR	0.5%	12.2%	-0.3%	7.7%
MAI	4.3%	17.0%	0.8%	8.6%
JUN	7.8%	26.1%	7.0%	16.2%
JUL	7.1%	35.0%	2.6%	19.2%

Average Net Asset Value for Dynamo Cougar
(Last 12 months): R$ 3.337.387.720

(*) 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 been raising apprehensions concerning the potential for sustainable growth, here in Brazil we have just lived through the worst four-year period of GDP growth in our republican history, the aftermath of a long period of dysfunctional public policies. The expectation of a reformist domestic agenda in a context of generalized excess capacity and high unemployment sustains fundamentals for the repricing of assets. Besides, the space for the reduction of real interest rates to civilized levels is an unprecedented reality in the country. In other words, at this moment, the two drivers of the macro substrate – fundamentals and flow – seem to converge, designing a more benign environment for stock investors. We recognize that the good winds can help in the propulsion of many companies in our portfolio, well-positioned as they are to capture opportunities should improvements in the business environments materialize.

At the time when the country decides to confront its own ghosts, distortions in the external scenario suggest apprehensions. In light of the last great financial crisis, the monetary excesses give signs of *dejá vu*. Positive temporal preference is an attribute of human psychology and an ingredient of civilized progress. Negative interest rates for prolonged periods does not seem like a sensible experiment.

What a prudent investor cannot afford to do is to lose musculature in the handling of the sails because he or she believes that the strong winds blown by the present situation will always be strong. They will not.

Rio de Janeiro, August 28, 2019.

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

www.dynamo.com.br

DYNAMO

DYNAMO ADMINISTRAÇÃO DE RECURSOS LTDA.
Av. Ataulfo de Paiva, 1235 / 6° andar. Leblon. 22440-034. Rio. RJ. Brazil. Phone: (55 21) 2512-9394. Fax: (55 21) 2512-5720