EXPLORING THE MINSKY CLIMATE MOMENT: A CONCEPTUAL ANALYSIS AND ITS RELEVANT FACTORS

Caetano Montenegro Mascarenhas*

RESUMO

O termo *Momento Minsky Climático* foi inicialmente introduzido por Carney (2015) como uma extensão do tradicional *Momento Minsky*, representando um paradigma emergente nas discussões sobre os riscos financeiros associados às mudanças climáticas. Apesar de sua crescente relevância, o conceito e os principais fatores que moldam esse fenômeno ainda permanecem pouco explorados. Este artigo aborda essa lacuna por meio de uma análise conceitual e teórica do Momento Minsky Climático. São examinadas as bases teóricas do conceito, com ênfase em suas implicações para a estabilidade financeira e ambiental, bem como sua importância no atual contexto de crise climática. Além disso, analisam-se os principais fatores que contribuem para a formação do Momento Minsky Climático, incluindo a exposição de ativos relacionados ao clima e as respostas de investidores e reguladores. Esse debate fornece subsídios para análises mais aprofundadas e para a avaliação da pertinência do conceito diante das dinâmicas das mudanças climáticas.

Palavras-chave: Crise Climática; Momento Minsky; Transição Climática; Instabilidade Financeira; Economia Política.
Classificação JEL: E12; E44; G1; G32; H12; Q54.

ABSTRACT

The term *Climate Minsky Moment* was first introduced by Carney (2015) as an extension of the traditional *Minsky Moment*, representing an emerging paradigm in discussions on financial risks associated with climate change. Despite its growing relevance, the concept and the key factors shaping this phenomenon remain underexplored. This article addresses this gap through a conceptual and theoretical analysis of the Climate Minsky Moment. The theoretical foundations of the concept are examined, with emphasis on its implications for financial and environmental stability, as well as its significance in the current context of the climate crisis. In addition, the main drivers of the Climate Minsky Moment are analyzed, including the exposure of climate-related assets and the responses of investors and regulators. This discussion provides a basis for more in-depth analysis and for assessing the applicability of the concept to the dynamics of climate change.

Keywords: Climate Crisis; Minsky Moment; Climate Transition; Financial Instability; Political Economy.
JEL Code: E12; E44; G1; G32; H12; Q54.

* Universidade Federal Fluminense, Faculdade de Economia, Niterói – RJ, Brasil. E-mail: cmmascarenhas@id.uff.br. ORCID: https://orcid.org/0000-0001-7486-1733

1. Introduction

The term *Climate Minsky Moment* was first used in 2015 in a speech delivered by Mark Carney, then Governor of the Bank of England. On that occasion, the author highlighted the need to mitigate information asymmetries as one of the central elements to conduct a sustainable transition[1]. Making information available on companies' carbon footprints, combined with the action of regulatory bodies, would allow for smoother adjustments in market prices and, consequently, would reduce the risk of a potential *Climate Minsky Moment* occurring (Carney, 2015, p. 13). Although the speech does not present further details on the phenomenon's operation, it is possible to establish a parallel between the impacts of climate risks on contemporary economies and the classic concept of a Minsky Moment.

The concept of a Minsky Moment refers to the inflection point where the confidence of market agents collapses, resulting in abrupt financial crises. In the climate case, the *Climate Minsky Moment* would be characterized by a sudden and significant drop in asset values, triggered by risks related to climate change. These risks can manifest in various ways, such as physical damage to property and infrastructure or stricter regulatory changes imposed by governments. Although Carney mentioned the term only once, briefly, its recurrence in the literature and media has increased. However, works systematically addressing its conceptual aspects and the factors that should be considered in the analysis of this economic phenomenon are still scarce.

The literature on climate risks and financial instability in the context of the ecological transition is broad, including studies that directly mention the term *Climate Minsky Moment* (Daumas, 2023). However, few works focus specifically on this concept. A survey conducted in the Scopus database identified only four articles that simultaneously contain the terms "Climate," "Minsky," and "Moment" in the title, abstract, or keywords.

Of these works, two stand out. The first, *Climate Change and Financial Instability: Risk Disclosure and the Problematics of Neoliberal Governance* (Christophers, 2017), argues that environmental damage caused by climate change increases the risk of debt default, asset devaluation, and financial crises, which can result in wealth losses, income drops, increased

[1] The transition to a sustainable economy is a process of structural transformation of the economy, with the objective of promoting sustainable development. This transition must be based on principles of equity, efficiency, resilience, and environmental sustainability (Ocampo; 2011).

unemployment, and political instability. The second, *Financial Stability, Stranded Assets and the Low-Carbon Transition – A Critical Review of the Theoretical and Applied Literatures* (Daumas, 2023), points out that the transition to a low-carbon economy can generate relevant financial risks, especially through the devaluation of carbon-intensive assets—the so-called *stranded assets*. Depending on the magnitude and intensity of this devaluation, a *Climate Minsky Moment* could occur.

Studies that incorporate the climate crisis into the analysis of financial instabilities, even with specific mentions of the term coined by Carney, converge in recognizing the relationship between climate risks and economic instability (Caldecott et al., 2016; Bovari, Giraud, & Isaac, 2018; Dafermos, Nikolaidi, & Galanis, 2018; Lamperti et al., 2018; Crocco & Feil, 2019; Hayne et al., 2019; Semieniuk et al., 2021; Bendixen, 2022; Campiglio et al., 2022; Miller & Dikau, 2022; Dafermos, Gabor, & Michell, 2023). A temporal tension is identified in these studies between the physical risks of climate change and the risks arising from the transition process. Understanding this tension requires the conceptualization of the different types of climate risks.

Economic literature classifies climate risks into three main categories: *physical risks, transition risks, and liability risks* (Crocco & Feil, 2019). Physical risks stem from changes in the global climate, which can generate extreme events that cause severe economic shocks, with substantial losses. As the climate crisis worsens, both the probability and intensity of these events increase. Transition risks, in turn, emerge from the structural changes necessary to achieve a net-zero emissions economy. Changes in consumption, production, and regulatory patterns can impact various sectors, generating economic disruptions, affecting asset valuation, and compromising financial stability, employment, and output. In this context, stranded assets—assets incompatible with a sustainable economy that lose value as the transition progresses (Caldecott et al., 2016)—gain prominence. In a financialized economy, the presence of large volumes of these assets amplifies the risk of financial crises spreading.

Liability risks derive from the previous two, manifesting in lawsuits filed by agents seeking compensation for losses caused by climate events or transition policies. Such litigation can represent new threats to the economic-financial equilibrium.

Based on these concepts, the *Climate Minsky Moment* can be interpreted as an adverse outcome of the temporal tensions between physical and transition risks—a kind of *trade-off* in defining the speed of economic transformation. Accelerating the transition process tends

to increase short-term economic risks, while postponing it elevates physical risks in the medium and long term. Ideally, the transition should be fast, considering the urgency of the climate crisis, but also orderly, so as to avoid abrupt asset devaluations (Bartelega, 2023).

The Intergovernmental Panel on Climate Change (IPCC, 2023) provides evidence that rapid and widespread changes are occurring in the atmosphere, oceans, cryosphere, and biosphere. Extreme weather events are already manifesting in several regions of the planet, revealing that physical risks are a current reality. Given this, the need for an economic transition becomes unquestionable. The discussion, therefore, shifts from the need for transition to how it will be conducted.

The speed and intensity of the transition are crucial factors in tackling the environmental crisis. However, there are uncertainties regarding the economic impacts of this transformation. A rapid transition can trigger financial crises associated with the loss of value of stranded assets (Caldecott et al., 2016), while a slow transition, although more stable from an economic point of view, reduces the chances of mitigating the most severe effects of climate change. Although the contours of this *trade-off* remain undefined, the emergence of a *Climate Minsky Moment* can be considered one of its potential consequences.

However, several analytical gaps persist: what are the theoretical foundations that support the possibility of the phenomenon? How does it articulate with climate risks? What would be its triggers and propagation mechanisms? What methodologies can be used for its identification and analysis? Furthermore, the need for a transversal debate is highlighted, including the institutional and political factors associated with the emergence and propagation of the *Climate Minsky Moment*, which are essential elements for its in-depth understanding.

2. Considerations on the Minsky Moment

Understanding the *Climate Minsky Moment* and its implications first requires an understanding of the original Minsky Moment concept. Interestingly, the term was not coined by Hyman Minsky, but was first used during the 1998 Russian Financial Crisis by the then director of Pacific Investment Management Company, Paul McCulley (Whalen, 2008a).

The concept is anchored in the *Financial Instability Hypothesis (FIH)*, according to which, in a prolonged environment of economic stability, economic agents – both creditors

and debtors – tend to assume increasingly fragile financial structures in the pursuit of higher profits. This generates a contradiction between short-term stability and potential long-term instability (Torres Filho, 2020).

One of the pillars of the FIH is the endogeneity of financial crises. In the light of Minskyan logic, the economy can be understood as a complex system of feedbacks between finance, investment, and profits, which condition economic cycles. As Minsky observes: "in a capitalist economy the past, the present, and the future are linked not only by capital assets and labor force characteristics but also by financial relations" (Minsky, 1992, p. 5). Cash flows are central to this dynamic: the mismatch between inflows and outflows, if not refinanced, makes the continuity of business unviable, potentially triggering a systemic effect.

The *Minsky Moment* can be described as a sudden and significant collapse in asset values, marking the end of an expansion phase in the credit cycle. The abrupt change in expectations leads to asset reallocation and paralyzes investment and financing flows. This creates a vicious cycle in which firms and other borrowers are expected to be unable to meet their commitments, while creditors, being more conservative, retract credit, favoring cascading defaults.

Minsky proposed three patterns of indebtedness: *Hedge, Speculative, and Ponzi* (Minsky, 1986; 1992). As economic stability conveys a false sense of security, firms increase their degree of leverage until they reach the Ponzi stage – unsustainable, as it depends on the continuous rollover of debt to maintain itself. Although Minsky focused on the behavior of firms, the growth of indebtedness can also be stimulated by inequality, leading families to contract debt to sustain consumption patterns (Kapeller & Schütz, 2014), as seen in the 2008 crisis (Whalen, 2008b; Yellen, 2009).

It is important to emphasize that the *Minsky Moment* is strongly related to an expectation shock: agents perceive that the premises that sustained their past decisions were not confirmed, leading to a sudden adjustment of financial positions (Bhattacharya et al., 2011). In this context, there is a sharp retraction in investments, a drop in production, an increase in unemployment, and, frequently, the need for Central Bank intervention to contain systemic damage.

The leveraging trajectory described by the FIH is based on corporate behavior in contexts of apparent stability, in which companies expand their return through leverage until

they reach a critical point where debt rollover becomes unviable (Minsky, 1992; Torres Filho, 2020).

However, the debate on the Minsky Moment goes beyond the FIH. It is not a unified theory, but an analytical concept that describes situations in which a sudden and widespread frustration of expectations leads to an abrupt reconfiguration of markets, marking the beginning of a crisis. It involves diverse theoretical aspects, such as the *survival constraint* (Torres Filho & Martins, 2020), micro-macro economic interactions (Mehrling, 1998), and the role of economic cycles (Palley, 2011).

The *survival constraint*, as defined by Torres Filho and Martins (2020), establishes that all economic agents — companies, families, government agencies, and banks — with the exception of the central bank, must continuously maintain a sufficient amount of liquid resources to cover their current expenses. If this constraint is violated, the agent incurs sanctions, which may include bankruptcy, default, or legal action.

Minsky, as interpreted by Mehrling (1998), emphasizes that this rule constitutes a fundamental pillar of financial relations in the capitalist system. Adherence to the survival constraint is crucial to ensure the stability of the financial system and the continuity of economic operations. Given this requirement, agents have no alternative but to maintain adequate stocks of liquid assets to honor their short-term commitments. In this sense, the relaxation of this constraint — for example, through expansionary monetary policies or emergency liquidity lines — can become a powerful instrument for stimulating economic activity (Mehrling, 1998, p. 141).

In the context of the micro-macro relations present in Minsky's thought, his work sought to integrate the decision logic of financial and non-financial firms, also considering the institutional aspects that shape the behavior of economic agents. This implies recognizing that individual decisions are made within an institutional[2] and structural framework that influences — and is influenced by — macroeconomic dynamics (Mehrling, 1998; Minsky, 1986).

[2] Influences from authors such as Schumpeter (KNELL, 2015) and Kalecki (Minsky, 2013) can be found, showing the flexibility of his theories and the capacity to use them in diverse economic phenomena. This type of approach brings an element of complexity to the treatment of the economy that will be fundamental for the incorporation of climate change.

3. The Climate Minsky Moment

A From the understanding of the Minsky Moment—a concept describing the endogenous instability of financial markets in the face of increasing cycles of leverage and euphoria followed by abrupt collapses—it is possible to discuss its application in the context of climate change. However, the conceptual bridge between the financial moment and the *Climate Minsky Moment* is not yet fully established in the literature.

Revisiting Mark Carney's speech, it is observed that the informational component plays a central role in the emergence of this phenomenon. For Carney, economic agents would make inappropriate decisions due to a lack of adequate information about climate risks, leading them to underestimate such risks in their portfolios and strategies. This informational asymmetry would result in fragile insurance structures, inadequate asset pricing, and the need for sudden adjustments in emissions trajectories, with potentially systemic impacts. Thus, Carney suggests that anticipating climate risks, through more precise information and prudential regulations, could prevent the materialization of a *Climate Minsky Moment.*

Breeden and Hauser (2019), in turn, use the expression *Climate Minsky Moment* to describe the possibility of an abrupt collapse in the prices of assets linked to carbon-intensive activities, generating significant adverse effects on economic and financial stability. The threat of a disorderly climate transition, according to the authors, makes the urgent adoption of measures to align economic and financial policies with climate goals necessary. However, their contribution is limited to a synthetic presentation—published in the *Global Public Investor Report* of the Official Monetary and Financial Institutions Forum—without more robust details on how to avoid such a scenario.

A relevant conceptual advance appears in the report *Preventing a 'Climate Minsky Moment': Environmental Financial Risks and Prudential Exposure Limits* by Miller and Dikau (2022). The authors start from the Breeden and Hauser approach but expand it using a more elaborate framework, highlighting the temporal tension between physical risks and transition risks. They argue that investments in low-carbon sectors remain far below what is necessary to achieve decarbonization goals, while the urgency to mitigate the effects of climate change intensifies. This dissonance between the pace of transition and climate objectives produces

a scenario of increasing vulnerability, in which an abrupt adjustment becomes increasingly likely - characterizing the possible triggering of a *Climate Minsky Moment*.

Based on the prospective scenarios of the Network for Greening the Financial System (NGFS, 2020), the authors propose four possible trajectories, resulting from the interaction between transition policies and climate risks:

1. Orderly transition – occurs with strong coordination between public policies, the private sector, and financial institutions, making it possible to achieve mitigation goals with limited economic impacts;
2. Disorderly transition – imposes hurried and disruptive adjustments on the economy, with possible asset collapse and financial instability, typical of a Climate Minsky Moment;
3. Hot house world – mitigation is neglected in favor of short-term economic stability, elevating physical risks in the long term;
4. Too little, too late – combines failures in mitigation and adaptation, simultaneously amplifying physical and transition risks, with severe economic and climatic consequences.

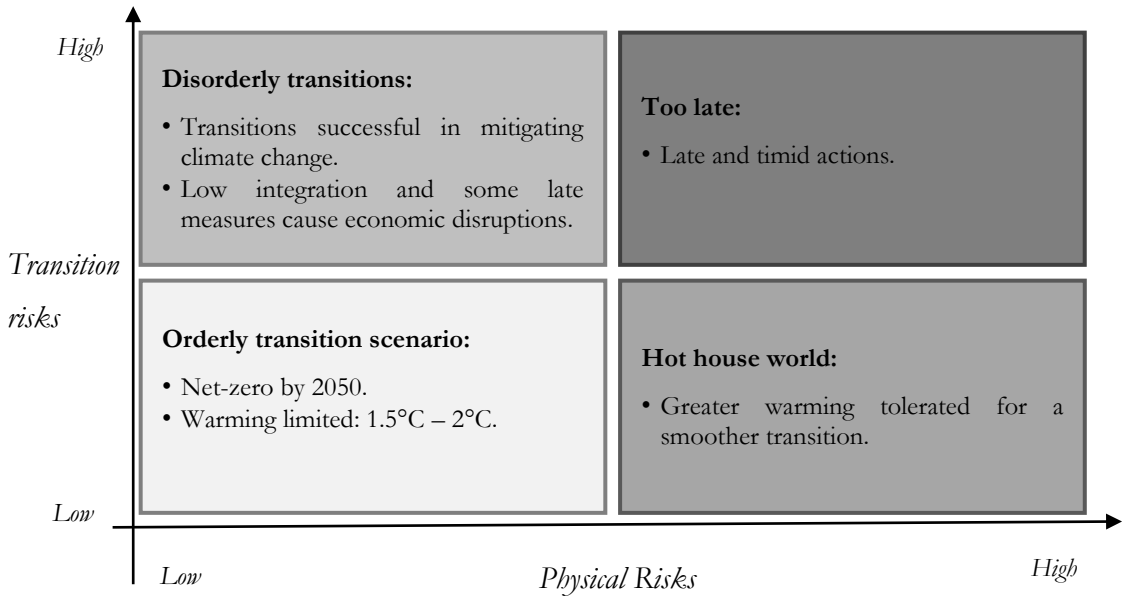
Although the authors do not explicitly emphasize the temporal factor as the structuring axis between physical and transition risks, it is inferred from the analysis that the mismatch between climate urgency and the speed of the institutional and financial response is the central element for understanding the dynamics of instability.

Finally, the potential role of central banks in formulating macroprudential policies that strengthen the resilience of the financial system in the face of the climate transition is highlighted. This includes everything from prudential limits on exposure to carbon-intensive assets to requirements for transparency and disclosure of climate risks, aligning financial stability with the objectives of environmental policy.

Following the logic presented so far, the *Climate Minsky Moment* presents itself as a phenomenon analogous to the fuse that ignited the 2008 subprime crisis. The sharp increase in the granting of mortgage loans to individuals with poor credit histories, combined with the dissemination of securities linked to these loans - the so-called Mortgage-Backed Securities (MBS) - into the portfolios of various banks and funds, created an environment of latent risk. This process was enabled by financial innovations that allowed the packaging of

these assets and by the endorsement of rating[3] agencies, which assigned high ratings to intrinsically fragile products. The perception of risk was diluted, and MBS came to be considered safe assets. However, as interest rates rose and borrowers failed to honor payments, many of these securities went into default. The aggravation occurred with the downgrading of the ratings, causing substantial losses, institutional collapses - such as the bankruptcy of Lehman Brothers - and requiring the intervention of the Federal Reserve.

Figure 1 - Climate risk tension framework



Source: Author's elaboration drawing on the NGFS (2020) presentation.

The *Climate Minsky Moment*, in turn, would correspond to the moment when assets currently considered safe suddenly become undesirable in the face of the materialization of climate risks, transforming into stranded assets. An illustrative example is the "U.S. Coal Crash" (Caldecott et al., 2016), where stricter environmental regulations, combined with falling natural gas prices, led to the bankruptcy of 26 companies in the coal sector in the United States.

In this context, the devaluation of assets linked to fossil fuels can be pointed out as a systemic threat to the global financial system. Such a process could trigger a crisis similar

[3] This attractiveness was largely underpinned by the endorsement of credit rating agencies, which were responsible for assessing firms and signaling the quality of financial assets to the market. The role of these agencies later became the subject of scrutiny, revealing a complex web of conflicts of interest that sustained favorable ratings for fundamentally weak or questionable securities (United Nations, 2023).

to 2008, although the *Climate Minsky Moment* remains a hypothetical event, not yet materialized, and surrounded by uncertainties regarding its dynamics and the effectiveness of institutional responses.

The *Climate Minsky Moment* can, therefore, be defined as an abrupt and significant collapse in asset values, driven by the widespread frustration of economic expectations in the face of the realization of climate risks - whether physical or transition. Inspired by the logic of Minsky's Financial Instability Hypothesis, this phenomenon is characterized by a sudden portfolio reallocation, increased preference for liquidity, and eventual rupture of credit circuits, culminating in systemic instability.

Its specificity lies in the temporal tension between physical risks (arising from prolonged inaction) and transition risks (arising from abrupt measures), configuring a dynamic *trade-off*, mediated by institutions and governance regimes, between the costs of delay and the costs of abrupt correction. The *Climate Minsky Moment*, thus, emerges as a financial crisis catalyzed by the environmental transition, whose triggers are deeply rooted in the economy's fossil structure, informational asymmetries, and the institutional inertia that delays a coordinated response to the climate crisis. In this scenario, the role of central banks and regulatory authorities becomes crucial to mitigate instability and promote a resilient transition.

4. Potential Triggers of the *Climate Minsky Moment*

The approach presented by Miller and Dikau (2022) offers an analytical framework in which the intensity of the transition plays a central role in assessing the probability of a *Climate Minsky Moment* occurring. It is important to emphasize, however, that an eventual trigger of this phenomenon would hardly occur in isolation; on the contrary, it would be accompanied by a series of adverse effects that, together, could aggravate economic and financial disorganization. This disorganization would be the result of the interaction between physical risks and transition risks, whose synergy tends to amplify the fragilities of the global financial system.

The intensity of the transition is deeply related to the pressure exerted by climate change and the perception of the urgency to act. This is expressed in multilateral agreements such as the Paris Agreement, which sets goals to limit global warming to 2 °C, with additional efforts to restrict it to a 1,5 °C compared to pre-industrial levels. Such goals indicate an

international recognition of the need to adjust the mitigation trajectory for greenhouse gas emissions. However, the policies effectively implemented so far remain substantially short of what is necessary, creating a mismatch between climate goals and real action.

An illustrative example of this gap can be observed in the composition of the global energy matrix[4]. Despite the recent progress of renewable sources, fossil fuels still widely dominate global energy consumption. Figure 2 clarifies this reality: more than 80% of globally consumed energy still comes from fossil sources. Given this scenario, the potential impact of shocks on these energy chains becomes evident, especially in the face of abrupt transition policies or the intensification of physical risks (such as extreme weather events affecting energy production or distribution).

Figure 2 - Global share of fossil fuels.

Source: Author's elaboration based on data from the Energy Institute – Statistical Review of World Energy (2023), processed and made available by *Our World in Data.*

The persistent global dependence on fossil fuels needs to be overcome, and this challenge indicates that the collective action required to achieve decarbonization goals is still far from being realized. Furthermore, there is growing concern about the inflationary effects associated with rising energy prices (BACEN, 2019). In this context, the dependence on

[4] Energy, which is a fundamental input for the functioning of the economy, is strongly dominated by the fossil sector. Although there are a series of debates involving the reduction of its consumption, such as degrowth strategies, decoupling between output and energy demand, or technological disruptions (Kallis, 2018; Gómez-Baggethun; 2020; Robbins, 2020), the current situation is the need for high energy consumption, especially as peripheral countries develop (Stern, 2011).

fossil sources represents another factor of systemic vulnerability, with the potential to trigger economic crises throughout the transition process.

Should this transition materialize as a broad and accelerated process, capable of making certain productive structures unviable—such as segments of the oil complex—two relevant developments can be anticipated: (i) inflationary pressure through an increase in production costs (cost-push inflation), and (ii) negative impacts on the balance sheets of companies and financial institutions. This scenario would create favorable conditions for the emergence of systemic financial crises, in line with the Minskyan logic of instability.

Additionally, the damage resulting from an excessively gradual or parsimonious decarbonization trajectory cannot be underestimated. As extreme weather events become more frequent and their economic impacts become materially visible, the pressure for abrupt adjustments in transition policies tends to increase. This is the classic definition of the risk of a disorderly transition, where delayed action requires a rapid and concentrated response within a short time window. As a result, there will be a proliferation of stranded assets, whose accelerated devaluation could compromise the solvency of companies and entire sectors—particularly carbon-intensive ones—generating a crisis comparable to, or even greater than, the 2008 global financial crisis.

In this sense, Breeden and Hauser (2019) warn that a climate financial crisis, triggered by the fall in the value of fossil assets, could surpass the impacts of the 2008 crisis because it would directly affect the real sectors of the economy. Semieniuk et al. (2022) estimate that the total value of stranded fossil assets in the oil and gas upstream sector could reach US$ 1,4 trillion. Caldecott et al. (2016, p. 6) present an even more alarming scenario: "Recent estimates suggest that 60–80% of fossil fuel reserves listed on stock exchanges are 'unburnable' if the world is to avoid catastrophic climate change, which could mean losses of up to US$28 trillion in revenues for the industry over the next two decades."

Given this panorama, the *Climate Minsky Moment* can be understood as a phenomenon emerging from the temporal tensions between transition risks and physical risks, with the materiality of the climate crisis acting as a catalytic element of this dynamic. As the effects of physical risks intensify, pressures for more rigorous mitigation policies also increase. However, this process is limited by a kind of institutional and economic *lock-in*, which anchors the system to the current fossil matrix, sustained by interests deeply rooted in the global economic structure (Unruh; 2000; Seto et al., 2016).

These interests are not trivial: large corporations and nation-states maintain close ties to the economic stability provided by fossil fuels and, therefore, resist changes that could affect their revenues, production chains, or geopolitical power (Semieniuk et al., 2022, Vormedal et al., 2023). Such structural resistance to sustainable transition constitutes a source of systemic risk.

Thus, the *Climate Minsky Moment* can be interpreted as an endogenous phenomenon to the management of climate risks, whose contours become clearer as the tensions between physical and transition risks intensify. The global economy remains highly dependent on fossil fuels while facing increasing pressure to mitigate the climate crisis. This paradox requires a critical reflection on the political, economic, and institutional conditions that can anticipate, aggravate, or mitigate the occurrence of the phenomenon.

5. Grey Areas and Reflections Regarding the *Climate Minsky Moment*

The first point to be raised concerns the Minskyan theory itself. It should be noted that there are possible fits—with due adjustments—of Minsky's framework in explaining crises, such as the 2008 crisis (Caverzasi, 2014). However, there are also skeptical positions regarding its applicability (De Antoni, 2010). As previously mentioned, the notion of a *Minsky Moment* carries the idea of a "reality shock," in which the gap between financial market expectations and the material fundamentals of the economy becomes evident. In the 2008 crisis, this shock occurred with the recognition that mortgage-backed securities had default rates higher than priced, revealing the unsustainability of the prevailing dynamic. Transposing this logic to the *Climate Minsky Moment*, the central question becomes: what would be the element of frustration?

At first glance, it seems intuitive to point to the sharp devaluation of fossil assets as this element. However, the question arises: what would be the mechanisms that would trigger this process? Would they be regulatory impositions, abrupt changes in carbon pricing, or social pressure and popular manifestations?

If we consider the emergence of a new regulatory arrangement that imposes severe restrictions on the exploration and use of polluting assets, the immediate consequence would be a drastic reduction in the expectation of future revenue streams generated by these assets. The frustration of these revenues would cause a significant contraction in the value of

portfolios containing these assets. As in the subprime crisis, this movement could trigger a series of defaults and, potentially, a chain reaction of liquidations, giving rise to a *Climate Minsky Moment*. The role of central banks, again, would be crucial in containing systemic effects.

However, unlike the 2008 crisis, this "reality shock" would not be exactly a surprise: decarbonization has been on the radar of economic agents for years. This predictability partially weakens the direct analogy with the traditional Minsky model.

On the other hand, the *Climate Minsky Moment* can also be conceived as a consequence of the materialization of physical risks. As these risks intensify—for example, extreme weather events—mitigation and adaptation measures become more urgent. This new regulatory and political impulse can provoke an abrupt acceleration of the transition, with profound impacts on assets and production chains, again creating a scenario of proliferation of *stranded assets* and, consequently, systemic risks. Even though this risk is within the agents' horizon, the asymmetry between response time and the severity of impacts can generate sudden instability.

Given this, the central debate shifts to the lack of global coordination and the geopolitical disputes that undermine the effectiveness of the transition process. The global economy requires a collaborative approach, but the divergence of interests—among countries, companies, and sectors—hinders the creation of robust international policies. This governance gap is exacerbated by the hegemony of a neoliberal paradigm, which has weakened the state's capacity for intervention, whether through restrictions on fiscal policy, deregulation of financial markets, or the deterioration of social safety nets (Christophers, 2017). This scenario amplifies vulnerability to financial and climate crises.

Thus, it becomes evident that at some point more forceful interventions will be inevitable to face the climate crisis. The doubt is not *if* these measures will occur, but *when*. The true dilemma, therefore, is not a *trade-off* between transition and stability, but a temporal tension between maintaining the *status quo* and the urgency of avoiding climate collapse. Substituting the term *trade-off* with *tension* is pertinent, as the latter recognizes the complexity of the conflict without suggesting the existence of mutually exclusive paths.

Furthermore, while the traditional *Minsky Moment* is more related to financial behavior, the *Climate Minsky Moment* involves direct real impacts on production chains and strategic sectors of the economy. There is, therefore, a convergence with elements

experienced during the Covid-19 crisis: logistical disruptions, cost inflation, and scarcity of strategic goods. This disorganization, if not carefully planned, could cause cost inflation and production disorganization, aggravating social inequalities and increasing the risk of political instability.

Finally, it is necessary to consider the hypothesis of a *pre-fabricated Climate Minsky Moment*. In this case, the crisis would not come from surprise at climate or transition risks, but from complacency with the current model. The insistence on the exploitation of fossil assets and the acceptance of physical risks would configure a scenario of tragedy on the temporal[5] horizon, as Mark Carney warns.

The transition to a low-carbon economy does not occur in a political vacuum. Economic, social, or environmental crises can catalyze intense political disputes. The uncertainty about the immediate economic impacts of the transition fuels ideological disputes, while organized interest groups exert significant power to shape the transition according to their interests. Corporate lobbying, in this context, acts as a barrier to the implementation of more rigorous policies (Culhane, Hall & Roberts, 2021). Thus, there is an urgent need to re-examine the relationship between corporate power and the political process, under penalty of compromising a just and sustainable transition.

6. Conclusions

There is a consensus[6] on the urgency of transitioning to a sustainable economy to avoid the worsening of the climate crisis. However, this necessity clashes with the current fossil "lock-in" that permeates the global economy. Despite the rhetoric of environmental concern and isolated initiatives, such as the subsidization of renewable sources, the effective implementation of these changes faces complex challenges, given the intricate network of interests and incentives.

The notion of a *Climate Minsky Moment* emerges in the context of the transition, seeking to understand the tensions between physical and transition risks. Nevertheless, the concept of a *Minsky Moment*, valuable for past financial crises, may prove insufficient to deal

[5] Describes the situation in which the costs of present actions are borne by future generations, while the benefits are enjoyed by the current generation. In the context of climate change, it refers to the idea that the costs of environmental impacts, such as extreme weather events, are transferred to the future, while the economic benefits of environmental destruction, such as the use of fossil fuels, are harvested in the present.
[6] This can be followed through the website: <https://www.ipcc.ch/>.

with the singularity of the climate transition. The complex interactions between the risks demand a deeper analysis.

The conclusion does not deny the challenges of the transition to a low-carbon economy and the resulting financial risks, but criticizes the direct application of the Minskyan framework. The *Climate Minsky Moment* may be interpreted too linearly given the complexity of the factors involved. The future of this transition will depend on assertive policies, global collaboration, and effective governance, while the resistance of corporate (and geopolitical) interests represents a significant barrier.

The necessary transformations in the economy will impact the productive structure and consumption patterns, generating winners, losers, and political-economic instability. Governments' parsimonious approach, aiming to preserve the economy in the short term, may result in abrupt changes with severe economic and environmental consequences. This inevitable deepening implies a transition under forced course, not as a surprise, but as a deliberately assumed risk.

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