

LAW AND ECONOMICS YEARLY REVIEW

ISSUES ON FINANCIAL
MARKET
REGULATION,
BUSINESS
DEVELOPMENT AND
GOVERNMENT'S
POLICIES ON
GLOBALIZATION

Editors

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The “Law and Economics Yearly Review” is peer-reviewed journal which aims to promote a legal and economic academic debate. It is published twice annually (Part I and Part II), by the Fondazione Gerardo Capriglione ETS (an organization that develops the research activity on financial markets regulation) in association with the Centre for Commercial Law Studies (CCLS), Queen Mary University of London. The journal faces questions about development issues and other several matters related to the international context, originated by globalization. Delays in political actions, limits of certain Government’s policies, business development constraints and the “sovereign debt crisis” are some aims of our studies. The global financial and economic crisis is analysed in its controversial perspectives; the same approach qualifies the research of possible remedies to override this period of progressive capitalism’s turbulences and to promote a sustainable retrieval.

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NATO'S UNCERTAIN COURSE

Francesco Capriglione*

ABSTRACT: *Since his presidency, Donald Trump has displayed a clear determination to dismantle significant elements of the institutional and regulatory framework that has traditionally underpinned the United States constitutional order. In particular, his presidency has challenged the long-established doctrine of checks and balances, designed to prevent the executive from extending its authority beyond the constitutional limits assigned to it. As a consequence, the traditional equilibrium among the branches of government - long regarded as one of the defining features of American constitutional democracy - has come under increasing strain. American foreign policy has experienced an equally significant shift. Rather than reflecting a coherent and consistent strategic vision, the President's approach has been characterized by abrupt shifts in direction, personal improvisation, and an increasingly transactional conception of international relations. The consequent unpredictability, coupled with a recurring contempt for the institutional traditions that typically legitimate the exercise of presidential authority, has damaged not only confidence in the President's leadership but also the international credibility of the United States itself.*

These trends obviously affect the future of the transatlantic alliance, which has historically based upon a delicate equilibrium between asymmetry of strength and a common community of political values. As this common normative foundation progressively erodes, the relationship is transformed: Europe risks losing its status as an equal partner and becoming a functionally subordinate actor. Such a

* Editor-in-Chief.

transformation has far-reaching implications for the European legal order itself. The European Union is based upon a community of law and common values; it cannot sustain its constitutional autonomy if it is reduced to a predominantly economic environment whose strategic choices ultimately depend upon decisions taken elsewhere.

Trump's conduct has further encouraged this tendency by fostering an atmosphere of prolonged political instability that unavoidably raises worries regarding the viability of NATO's collective defence mechanism. Although successive American administrations had already urged European allies to assume a greater share of the financial and operational burdens of collective defence, the current administration has elevated those demands to an unprecedented level, transforming burden-sharing from a matter of alliance management into a central instrument of political leverage.

The continuous threat of a hypothetical American withdrawal from NATO has subsequently become less a true strategic objective than a powerful negotiation weapon aimed at compelling European governments to raise military expenditure in order to sustain a technologically advanced defence capability. Underlying this approach is a concept of the Atlantic Alliance that resembles a contractual, almost private-law relationship: those who pay financially are entitled to protection, whereas those who fail to do so cannot rightfully claim the solidarity of their allies. From this perspective, the ultimate objective appears to be a transition towards a model of burden shifting, under which the United States would progressively relinquish primary responsibility for financing conventional defence, transferring both financial obligations and operational responsibilities for regional security to its European allies.

Europe therefore finds itself confronted with a fundamental geopolitical option. It may continue to rely upon the existing framework, expecting that future political changes in Washington may eventually modify the current American approach.

Alternatively, it may elect to assume direct responsibility for its own security through a progressive strengthening of its autonomous defence capabilities. This, in turn, indicates towards a steady Europeanisation of NATO. Such a process should not be read as suggesting either an imminent exit of the United States from the Atlantic Alliance or the immediate development of a fully autonomous European army. Rather, it would imply the change of NATO from an alliance largely directed by the United States into a genuinely two-pillar framework, depending upon an American and a European strategic component. This is the direction emerging from the recent NATO Summit held in Ankara. Its implications deserve careful consideration by the European States. The principal risk is that Europe may eventually assume an ever-growing share of the financial burden of collective defence while the political and strategic leadership of the Alliance remains substantially concentrated in American hands.

SUMMARY: 1. The repercussions of the Trumpian storm within the United States... - 2. (continued): ...and in US foreign policy. - 3. The limitations of the Atlantic Alliance in Trump's conception. - 4. Trump's reinterpretation of the North Atlantic Treaty. - 5. (continued): ...the possibility of US withdrawal. - 6. The prospect of a Trumpian "colonising" design. - 7. Towards the Europeanisation of NATO?... - 8. (continued): ...what benefits and what difficulties? - 9. The Ankara NATO Summit: consequences and prospects.

1. The period of approximately two years since Donald Trump took office as president of the United States should undoubtedly be regarded as too short to permit an assessment of the results of the exercise of power by the world's most powerful political leader. Nevertheless, from the very beginning of his term, the current head of the US Executive has conducted himself - and continues to do so - in a manner that now leaves little doubt as to how he intends to proceed throughout his presidency, marking a change, perhaps an irreversible one, in US

policy at both domestic and international levels. On several occasions during these two years, faced with the growing astonishment aroused by the US President's policies - and shared by those who have watched, first with surprise and then with disbelief and concern - the succession of events attributable to the tycoon that appear destined to reshape the planet's geopolitical order - I have questioned the consequences of his age, which is decidedly at odds with that of his predecessors. To that end, I have sought to examine the stages of his political trajectory with a view to reaching an assessment that might help me determine whether, as may readily be surmised, Trump is merely the epiphenomenon of a different underlying reality: a broad process through which American democracy is being transformed in an autocratic direction. Regrettably, in light of the course of conduct he has pursued, this hypothesis appears increasingly plausible.¹

Starting with the appointment of the members of his Cabinet - leaders whose principal qualification lies in the relationship of personal trust they enjoy with the head of the US Executive - this inquiry seems clearly to reveal his intention formally to centralize power in his own hands. We are, indeed, confronted with a course of action aimed at curtailing the autonomy of independent institutions, first and foremost the judiciary, which under the constitutional arrangements of the United States is entrusted with reviewing executive action. Those appointments were followed by the adoption of measures that place the resilience of the US institutional framework under severe strain, with an evident weakening - if not a tendency towards the elimination - of the characteristic equilibria that, until recently, made it possible to regard the United States as a classic model of liberal democracy.

More specifically, at the domestic level, the tycoon's recourse to executive

¹ See CAPRIGLIONE, *Il declino delle democrazie liberali*, Milan, 2025, *passim*; ID., *Gli esiti del trumpismo e la nuova realtà geopolitica*, in *Aperta Contrada*, 19 December 2025; ID., *Etica e finanza nella tempesta trumpiana (problemi e prospettive)*, in *Rivista di diritto bancario*, 2026, p. 23 et seq.

orders - often intended to circumvent Congress in order to implement political projects that would ordinarily require the approval of that political body—appears either directed towards strengthening his electoral base or designed to bypass democratic debate, thereby amounting to a manifest abuse of executive power. It is within this context that one must place the substantial number of dismissals targeting his political opponents;² the inhumane persecution of irregular migrants detained at Guantánamo Bay;³ the arrest of a Wisconsin judge accused of helping a Mexican migrant evade arrest;⁴ and other measures of a similar nature, which make it possible fully to assess his personality.

Moreover, particularly significant for the purpose of clarifying the doubts raised by the situation described above is the abandonment of the well-known principle of separation between politics and the economy. This phenomenon can be seen both in the position granted by Trump to the world's richest man, Elon Musk -appointed as his adviser and as head of the Department of Government Efficiency (“DOGE”) - and in the relationship he maintains with the oligarchic circle of the American techno-plutocracy. On closer examination, these policy choices made by the President constitute elements of a broader project that transcends his individual personality, since it is intended to bring about a world fragmented into spheres of influence and governed by illiberal powers, consistently with the

² See the editorial entitled *La vendetta di Trump, licenziati alti dirigenti dell’Fbi e procuratori che hanno indagato su di lui*, available at: https://www.repubblica.it/esteri/2025/02/01/news/trump_vendetta_fbi-423974483.

³ See the editorial entitled *Trump shock: “I migranti irregolari andranno a Guantanamo”*, 30 January 2025, available at: https://www.ansa.it/sito/notizie/mondo/nordamerica/2025/01/29/trump-nessuno-tenta-piu-di-entrare-negli-usa-_670352f8-bebf-45aea1b7-0be5c4d3ee8e.html.

⁴ See the editorial entitled *Casa Bianca: chi intralcia gli ordini di Trump può essere perseguito, anche se è un giudice della Corte Suprema*, 28 April 2025, available at: www.ilsole24ore.com/art/casa-bianca-chi-intralcia-ordini-trump-puo-essere-perseguito-anche-se-e-giudice-corte-suprema-AHyGijV. The article reports that, when White House Press Secretary Karoline Leavitt was asked whether the Trump Administration would consider arresting a federal judge or a Justice of the Supreme Court, she replied: “Anyone who breaks the law or obstructs federal law-enforcement officers in the performance of their duties exposes themselves to the risk of prosecution”.

autocratic vision underlying the well-known conservative political program known as Project 2025.⁵

Indeed, while the appointment of Musk - a technology entrepreneur and well-known supporter of cryptocurrencies - may suggest that Trump expected to derive advantages from their friendship, not least in view of his own interest in digital finance, there can be no doubt that this convergence of interests foreshadows numerous adverse consequences for the United States. Although the latter possesses a comprehensive legislative framework intended to promote competition and prevent monopolistic practices capable of harming consumers and the market, it risks encountering instances in which antitrust regulation is not enforced.

It is likewise reasonable to assume that the President's aforementioned relationship with the techno-plutocratic oligarchy will facilitate the latter's ascent to power, since it is capable of exerting significant influence over the political process with a view to securing legislation and tax measures favourable to its own interests.⁶ Hence the process of deregulation initiated by Trump, whose actions are shaped by the libertarian rationale and the business-oriented spirit that constitute

⁵ See the editorial entitled *Trump claims not to know who is behind Project 2025. A CNN review found at least 140 people who worked for him are involved*, available at: <https://edition.cnn.com/2024/07/11/politics/trump-allies-project-2025/index.html>. It should be noted that this project forms part of a broader body of work developed over the years by the Heritage Foundation, whose mission is to promote conservative public policies based on the principles of free enterprise, limited government, individual freedom, traditional American values, and strong national defence; see *Heritage Foundation Homepage*, available at: <https://web.archive.org/web/20170530184845>.

⁶ See the editorial entitled *Con i primi decreti Trump sta ringraziando le oligarchie Tech per l'appoggio elettorale*, in *L'Indipendente*, 27 February 2025, which states: "Donald Trump's newly installed Administration has immediately bestowed a generous gift upon the oligarchs who supported his candidacy. Indeed, in a memorandum addressed to the new Secretary of the Treasury, Trump has withdrawn the United States from the Global Tax Deal. The agreement, negotiated by the Biden Administration in 2021 and signed by 140 countries, provides for a Global Minimum Tax—that is, a worldwide tax regime imposing a minimum effective rate of 15 per cent upon multinational companies with revenues exceeding EUR 750 million".

defining features of his personality.

On the basis of these considerations, it is evident that Trump's domestic policies are inevitably having adverse repercussions upon the equilibrium established by the system of checks and balances -a mechanism intended to prevent the head of the executive from exceeding the limits of the powers conferred upon him by the Constitution- as well as upon the balance among the branches of government that safeguards the paradigm of democratic government.⁷

The conduct of American foreign policy over the past two years also reflects an interventionist approach. This approach operates under a rationale that deviates from the standard norms governing the appropriate exercise of institutional powers in a democratic state.

It should be acknowledged that, in the long term, the unpredictable conduct of the President of the United States -and therefore his frequently disconcerting attitude, characterized by continual shifts in decision-making that render him "consistent in his inconsistency"- will further erode not only his own credibility but also that of the United States itself, to an even greater extent than has already occurred. This is evidenced by the recent downgrade of the United States' sovereign credit rating by the well-known rating agency Moody's.⁸

2. The foreign policy pursued by the American Government likewise fully reflects the rationale underlying the Trump Administration's domestic policies, with

⁷ See, among many, NEUSTADT, *Presidential Power and the Modern Presidents: The Politics of Leadership from Roosevelt to Reagan*, Free Press, 1 March 1991. This mechanism should require the President of the United States to account for his decisions to other institutions - Congress and the Supreme Court - with which the head of government must interact so that the outcomes of both *policy* and *politics* may be determined jointly.

⁸ See the editorial entitled *Moody's declassa il rating degli Usa*, 16 May 2025, available at: <https://www.ilsole24ore.com/art/moody-s-declassa-rating-usa-AHvxx7n>. The article explains that the downgrade was decided "because of concerns arising from USD 36 trillion in public debt and from the Trump Administration's plans for further tax cuts, only partially offset by reductions in expenditure allocated to healthcare, the ecological transition, and welfare".

the additional aggravating factor that it is implemented in ways that frequently exacerbate the supremacist tendencies characterising the manifold expressions of a system of elective autocracy, as the present American regime may now be described.

As has been observed in legal scholarship, this model of government finds fertile ground in ailing democracies, in which populism, combined with the extremes of a conservative ideology, ultimately gains the upper hand. In such cases, one consequently witnesses a form of “personalisation” of the political system, as can now be observed in the United States.⁹

A climate is thereby created that favours the emergence of neo-imperial conceptions of sovereignty, as a distinctive manifestation of a power-based rationale. This leads to the establishment of a form of government in which power is not merely an instrument of defence, but becomes the very purpose of political action, which employs particular organisational criteria in order to assert the supremacy of domination over law.

I refer, in particular, to the presence of an “imperial rationale”, based upon the exercise of expansive force and upon the capacity to impose an “order” - political, military and hierarchical - to which the legal and economic status of its recipients must be subordinated.

It follows that, when confronted with the excesses of a power frequently exercised without restraint, international law is exposed to imbalances in its application that undermine its function, which becomes subordinate to the *desiderata* of the holder of power. Hence the current crisis in the effectiveness of this branch of law. In the present historical phase, that crisis may be understood as the result of a plurality of structural transformations simultaneously affecting geopolitics, the economy, technology and the very form of the modern State.

⁹ See BOVERO, *Autocrazia elettiva*, in *Costituzionalismo.it*, 2015, no. 2.

On closer examination, moreover, the events of recent years-military aggression, systematic violations of humanitarian law, genocides or comparable practices, the selective use of sanctions, and the paralysis of international organisations - reveal the perverse effects of the situation described above. They create the impression of a historical regression caused by the return of force as an organising principle of international relations.¹⁰

Before proceeding to a detailed analysis of some of the most significant measures through which Trump altered the geopolitical equilibrium of the world during the first two years of his presidency, it should be recalled that, from the period immediately following the end of the Second World War - that is, when the conditions for the emergence of a unipolar order arose - the United States performed a role that, in certain respects, may be associated with an imperial rationale.

It must nevertheless be emphasised that, as a general rule, its conduct consistently respected the systemic principles characteristic of democratic regimes. This was true not only of the relationship between American citizens and the institutions of the United States Government, but also of its relations with other States and, first and foremost, with its European allies.

By contrast, the tycoon - who had already demonstrated during his first term an intention to dismantle the pre-existing framework of United States regulation, with inevitable repercussions upon the implementation of the commitments undertaken by the country towards the other nations of the world¹¹ - did not

¹⁰ See, most recently, MONTEDORO, *Meditazioni sul rapporto tra diritto e forza*, Bari, 2025, *passim*.

¹¹ Particularly significant in this respect was the escalation of measures contrary to the prevention of the adverse effects of climate change, culminating in the failure to ratify the Paris Agreement. See the editorial entitled *Come Donald Trump sta rivoluzionando le politiche ambientali degli Stati Uniti*, 1 June 2017, available at: <https://formiche.net/2017/06/ambiente-trump>. The article recalls, inter alia, the repeal of Obama's Stream Protection Rule, which imposed restrictions upon the discharge into rivers of by-products resulting from hydrocarbon extraction.

hesitate, following his victory in the 2024 elections, to display before the entire world a programme inspired by a triumphant imperialism.

His conduct, however, is not distinguished by consistent adherence to a rigorous strategy. On the contrary, it is marked by improvisation, unpredictability and, above all, a lack of respect for the standards that should legitimise the exercise of his office.

He therefore rapidly became known throughout the world - to say nothing of other aspects of his conduct - for his arrogance, the constant reversals that invest his actions with contradiction, and the fake news with which his speeches are continually filled. In this way, he undermines not only his own reliability but also that of the country which entrusted him with the presidency.

It is in the light of these premises that certain events attributable to him must be assessed. In addition to bringing discredit upon the United States, as I have already pointed out, those events have erased a long history of friendship and cooperation with numerous Western countries, which have also been compelled to witness the impairment of their economic growth as a result of the energy shortages caused by wars initiated by Trump.

Proceeding systematically through this *cahier de doléances*, attention must first be drawn to the contemptuous attitude displayed by the tycoon towards the allies of the European Union. This was apparent from his first Cabinet meeting, during which he did not hesitate to declare that “the EU was formed to screw the United States”.¹² He is convinced that America has long conferred benefits upon its allies and that this situation has now become unsustainable, with the result that such unwarranted support must be brought to an end.¹³ His underlying intention is,

¹² See the editorial entitled *Trump says the EU was formed to “screw” the United States*, available at: <https://www.france24.com/en/europe/20250226-trump-says-eu-formed-to-screw-united-states-tariffs>.

¹³ Of interest is the response given by the spokesperson for the European Commission: “United

in all probability, to recover from those countries at least part of the resources disbursed in the past, in order to restore balance to the United States budget or, at the very least, to reduce its deficit.

Hence the European Union is subjected to recurrent attacks intended to prevent its consolidation and to obstruct the achievement of political union within the “Old Continent”. Ultimately, this design pursues the objective of reducing the Member States to a condition of complete subordination. This explains the preference for a system of relations based upon a multiplicity of bilateral arrangements, rather than upon a unified relationship with a federal State.

This rationale reflects the traditional principle of *divide et impera*, an expression of uncertain origin but commonly employed to describe a well-established technique for exercising power, according to which the fragmentation of the parties with whom one interacts constitutes an effective means of increasing the dominant actor’s capacity for influence.

Consistently with this approach, Trump imposed a policy of tariffs extending to almost every country in the world, measures described by authoritative political figures as unjustified or mistaken.¹⁴ They were followed by a strong reaction from the markets,¹⁵ which induced him to reverse course and accept the prospect of entering into negotiations with the States affected by the tariffs, thereby

States investments in Europe have ... [always been] ... highly profitable”. See the editorial entitled *L’Ue replica a Trump*, “*siamo stati una manna per gli Usa*”, 26 February 2025, available at: https://www.ansa.it/europa/notizie/rubriche/altrenews/2025/02/26/lue-replica-a-trump-siamo-stati-una-manna-per-gli-usa_e4f8817c-0dd8-4c52-a072-31594a2e6acc.h

¹⁴ See the editorial entitled *Mattarella boccia i dazi di Trump*: “*un rischio per l’economia globale*”, available at: <https://lavocedineويورك.com/news/2025/04/30/mattarella-boccia-i-dazi-di-trump-un-rischio-per-leconomia-globale>. See also the editorial entitled *Meloni: “I dazi di Trump profondamente sbagliati. Subito aiuti per le aziende, 25 miliardi dalla revisione di Pnrr e fondi di coesione”*, available at: www.corriere.it/economia/aziende/25_aprile_08/meloni-i-dazi-di-trump-profondamente-sbagliati-subito-aiuti-per-le-aziende-25-miliardi-dalla-revisione-di-pnrr-e-fondi-di-coesione-f4b54196-233a-4940-8ca4-7bec61065x1k.

¹⁵ See the editorial entitled *La reazione dei mercati ai dazi*, available at: https://www.deutsche-bank.it/news/detail/cio-la-reazione-dei-mercati-ai-dazi?language_id. The article emphasises that United States trade policy and its unexpected reversals generated widespread concern regarding a global recession, with inevitable repercussions upon financial-market performance.

demonstrating his willingness to scale back his demands.

His intention to bring commercial policy, through such measures, within the sphere of his personal discretion is evident. In so doing, however, he has created a situation of chaos that certainly does not contribute to the equilibrium of the financial markets. This is quite apart from the damage thereby inflicted upon the process of economic development throughout the world, as may be inferred from the remarks made by the Governor of the Bank of Italy, Fabio Panetta, in the *Concluding Remarks* delivered in 2025. He referred to the “new uncertainties arising from tariff barriers ... [which] ... could subtract almost one percentage point from global growth over a two-year period”.

Another distinctive aspect of the American President is the metamorphosis that characterises his conduct. During the electoral campaign and the first months of his term of office, he had openly portrayed himself as a man of peace, even promising that he would be able to resolve the Russo-Ukrainian war “in just 24 hours”. Hence his aspiration to receive the Nobel Peace Prize, supported by the nomination submitted in July 2025 by his friend Netanyahu.¹⁶

To this must be added the unexpected bellicose spirit currently displayed by Trump in the recent war waged against the Islamic Republic, thereby presenting an image of himself radically at odds with that of the peacemaker projected during the electoral campaign.

Indeed, as early as the end of the first six months of his presidency, his sudden aerial attack against the Islamic Republic “wrong-footed America, causing bewilderment throughout the world and also within the MAGA movement”.¹⁷

¹⁶ See the editorial entitled *Netanyahu a cena da Trump, “ho candidato il presidente Usa al Nobel per la pace”*, 8 July 2025, available at: www.ansa.it/sito/notizie/mondo/mediooriente/2025/07/08/netanyahu-a-cena-da-trump-ho-candidato-il-presidente-usa-al-nobel-per-la-pace_28412b86-182748fd-a31e-99a611efe4ad.htm.

¹⁷ Thus the editorial entitled *Lo strappo di Trump spiazza la sua America*, 22 June 2025, available at: www.corriere.it/oriente-occidente-federico-rampini/25_giugno_22/strappo-trump-spiazza-america-218006bd-0b18-4105-a566.

Trump decided to become involved in this “lightning war”, initiated by Israel, in pursuit of the objective of preventing Iran from becoming a nuclear power. He did so in the belief that this objective entitled him to attack a sovereign State, while acting without anyone’s knowledge and even refraining from informing the United States Congress of his intention to bomb Iran’s nuclear facilities.¹⁸

A few months later, in January 2026, the American President’s bellicose spirit manifested itself once again when he ordered a military operation against Venezuela, named *Operation Absolute Resolve*. Through a night-time raid, the operation led to the relatively easy capture of Nicolás Maduro and his wife. Once again, Congress was informed only *ex post*, and a justification was promptly supplied: the declared intention to administer the country until a secure transition could take place, while simultaneously acquiring access to its vast oil reserves. This course of action was probably inspired by the well-known doctrine proclaimed in 1823 by United States President James Monroe, a cornerstone of American foreign policy encapsulated in the slogan “America for the Americans”.^{19 20}

Furthermore, at the end of February 2026, once again drawn into conflict by Netanyahu, Trump embarked upon a new war against the Islamic Republic. Although the large-scale American offensive - aimed at achieving regime change and completely dismantling the nuclear programme - began with the killing of Supreme Leader Ali Khamenei, Iran demonstrated a considerable capacity for retaliation. United States bases in Kuwait and the Gulf were struck, and the Strait of Hormuz was occupied, with the inevitable disruption of oil routes and

¹⁸ See the editorial entitled *L’annuncio di Trump: “Raggiunto il cessate il fuoco tra Israele e Iran”*, 23 June 2025, available at: www.ilsole24ore.com/art/l-annuncio-trump-cessate-fuoco-completo-israele-e-iran.

¹⁹ See the editorial entitled *Venezuela, Trump attacca Caracas e cattura Maduro, “gestiremo la transizione”*, available at: https://www.ansa.it/sito/notizie/mondo/2026/01/03/trump-attacca-caracas-e-cattura-maduro-gestiremo-la-transizione_eef12e17-1702-4614-b99f-133e37e414c0.html.

²⁰ See the editorial entitled *Che cos’è la Dottrina Monroe, la chiave per capire l’attacco USA al Venezuela*, available at: <https://www.fanpage.it/esteri/che-cose-la-dottrina-monroe-la-chiave-per-capire-lattacco-usa-al-venezuela>.

consequent harm to the economic interests of numerous countries as a result of the ensuing energy crisis.²¹

A series of meetings intended to secure a truce has thus far ended in substantial failure. Consequently, notwithstanding Trump's continuing assertion that he has defeated Iran,²² the situation reveals a serious stalemate and is marked, in any event, by the perception that the conflict constitutes a strategic failure for the United States.²³ The Executive is therefore compelled to manage the consequences of an unpopular operation that appears to have been manifestly misconceived.

It follows that this American policy -to say the least unusual when compared with that pursued in the past- is reflected in a course of conduct which, at the international level, has caused a progressive curtailment of the operational role of the United Nations, together with an increasing openness towards the school of thought inspired by neoconservatism. The latter ultimately exerts, albeit implicitly, a significant influence upon the socio-political orientation of the United States, with the inevitable consequence of prompting the observer to raise serious questions concerning the emergence of an expansionist nationalism and an American neo-imperialism.²⁴

We are confronted with a figure who never ceases to astonish the world, not

²¹ See the editorial entitled *Bussando alla porta dell'Inferno*, in *Limes*, no. 3, 2026. Starting from the relationship between Netanyahu and Trump, the article examines the manner in which they conducted the war against Iran, highlighting the "miscalculation" they made in underestimating Tehran's actual capacity for resistance.

²² See the editorial entitled *Iran, Trump: "Abbiamo vinto la guerra, non si aspettavano niente del genere"*, available at: <https://stream24.ilsole24ore.com/video/mondo/iran-trump-abbiamo-vinto-guerra-non-si-aspettavano-niente-genere/AIV97ZuB>.

²³ See the editorial entitled *Gli Stati Uniti in Iran non hanno ottenuto niente*, available at: <https://www.internazionale.it/opinione/pierre-haski/2026/05/07/triplice-fallimento-stati-uniti-iran>. The article observes that the war in Iran "risks ending in an epic failure". Indeed, after three months of war, the conflict has not yet ended, and it appears likely that a settlement is approaching on terms that remain very far removed from the initial objectives of the United States and Israel.

²⁴ See BRUSCHINI, *Isolazionismo e militarizzazione, tra Groenlandia e Venezuela: come la politica di Trump sta rimodellando il potere globale*, in *Forbes*, 20 January 2026, available at: <https://forbes.it/2026/01/20/isolazionismo-come-politica-trump-rimodella-potereglobale>.

least because of the unconventional manner in which he interprets his own role. During the most recent months of his Administration, his behavioural aberrations, far from diminishing, have become more pronounced. This may be inferred from the disrespectful attitude he has adopted even towards Pope Leo XIV,²⁵ provoking justified reactions not only among Catholics throughout the world but also from certain political leaders—including the head of the Italian Government—who, by reason of ideological affinity, had supported him and endorsed his actions since the time of his election.²⁶

It is evident that the systemic changes taking shape across the world as a consequence of the rise of Trumpism and of the business-oriented rationale guiding its principal directions do not allow us to hope that the tensions which, since his appointment, have unquestionably disrupted the geopolitical order are close to being overcome.

3. Donald Trump's rise has recently been described by a perceptive scholar as a structural rupture that has transformed American democracy in an autocratic and nationalist direction.²⁷

This apt characterisation of the current situation in the United States helps

²⁵ See the editorial entitled *Trump contro il Papa: "Debole, senza di me non sarebbe in Vaticano". Anche Vance duro con Leone XIV*, available at: <https://www.rainews.it/articoli/2026/04/trump-contro-il-papa-un-debole-senza-di-me-non-sarebbe-in-vaticano-2b3421f3-a2d8-401b-aea9-1d280271bd82.html>. The article reports the American President's extraordinary attack upon Leo XIV: "Terrible on foreign policy; he accepts that Iran should possess nuclear weapons and harms the Church".

²⁶ See the editorial entitled *Meloni: inaccettabili le parole di Trump nei confronti del Papa*, available at: www.ilsole24ore.com/art/presidente-vescovi-americani-trump-parole-denigratorie-il-papa-AImy4OTC. On Trump's attitude towards Pope Leo XIV, see also DE RUVO and ROBERTSON, *Trump contro Leone minuto per minuto*, in *Limes*, no. 4, 2026, p. 111 ff.

²⁷ See FABBRINI, *Tsunami Trump: Il nazionalismo americano e l'Europa*, in *Il Sole 24 Ore*, 2026, *passim*. In this work, the author adopts a methodological approach based upon an assessment of the relationship between domestic changes in the American political system and the objectives pursued externally by its leaders, within international relations, where domestic politics is projected beyond the State. Hence the careful examination of the severe impact of Trump's excesses upon the European Union, highlighting the latter's political fragility and its considerable military dependence upon the United States.

us to understand the chaos pervading the conduct of the Federal Government, in which, as the specialist press has observed, “the anarchic monarch increases his family’s wealth ... and amuses himself by setting everyone against everyone else, going so far as to threaten withdrawal from NATO, a paper tiger”.²⁸

The defining features of “Trumpian thought” outline a perspective in which reference to Carl Schmitt’s decisionist doctrine appears unavoidable. The centrality attributed to the sovereign decision, released from normative constraints, produces a regression towards pre-constitutional models.²⁹ The President’s statements concerning the replacement of law with his own personal morality³⁰ reveal an anthropological transformation of power: no longer institutions, but personalities; no longer rules, but subjective convictions.

This phenomenon marks the dissolution of the public legal order, which is replaced by an informal and charismatic power.³¹ Following the teaching of authoritative legal scholarship, it may be said that the preconditions for a crisis of legality arise when political power ceases to recognise any limits external to itself.³²

This state of affairs has repercussions upon the future of the transatlantic alliance, which has historically rested upon an equilibrium between an asymmetry

²⁸ See the editorial entitled *Bussando alla porta dell’inferno*, in *Limes*, no. 3, 2026, p. 7.

²⁹ See the celebrated work *Politische Theologie*, Berlin, 1922; Italian translation, *Teologia politica*, Bologna, 1972. The work analyses sovereignty, maintaining that the modern concepts of the State are secularised theological concepts, linking politics to decisionism and asserting that the rule subsists only by virtue of the exception.

³⁰ See QUATTROCCHI, *Trump: “Non ho bisogno del diritto internazionale, mi basta la mia morale”*, available at: www.aise.it/rassegna-stampa/trump-non-ho-bisogno-del-diritto-internazionale-mi-basta-la-mia-morale-di-alessandra-quattrocchi/227794/1. The article reproduces a passage from Donald Trump’s extensive interview with *The New York Times* that clearly expresses his view of the world: his power as Commander-in-Chief is limited solely by his “personal morality”, rather than by external constraints.

³¹ See CASSESE, *Il diritto globale. Giustizia e democrazia oltre lo Stato*, Turin, 2009. The work examines the global legal space, characterised by the presence of sector-specific regulatory regimes, each possessing its own system of rules and an apparatus responsible for their enforcement, whose activity extends beyond the boundaries of the State.

³² See ZAGREBELSKY, *Il diritto mite. Legge, diritti, giustizia*, Turin, 1992. The author demonstrates that legal rules can no longer constitute either the expression of partisan interests or formulations of universal and immutable conceptions that some may impose and others must endure.

of power and a convergence of values. The disappearance of the latter produces a radical transformation of the relationship: Europe loses its role as a partner and assumes that of a functionally subordinate entity.

Hence the inevitable transformation towards which the European legal order appears to be moving. That order is founded upon a community of law and values which cannot retain its autonomous integrity if it is reduced to a mere economic area dependent upon decisions taken externally.³³

From the very beginning of his presidency, Donald Trump created a climate of acute tension that gives rise to legitimate doubts concerning the future of the present system of collective defence among NATO member countries. Building upon the antecedents of a situation that had already emerged under previous Administrations, he has brought an unprecedented degree of radicalisation to the complaints that American Governments had previously addressed to Europe.

I refer, in particular, to the fact that, for more than twenty years, the United States has denounced the failure of its European allies to comply with the principle of so-called burden-sharing, under which NATO member countries should contribute equitably to the costs and responsibilities of common defence. The Administrations of Barack Obama and Joe Biden had already impressed upon their transatlantic allies the need to make a greater contribution to common military-protection expenditure; they had done so, however, in a cooperative tone.³⁴ Trump, by contrast, has demonstrated through his threatening attitude an intention to transform that principle into a criterion of an essentially contractual nature and, as

³³ See VON BOGDANDY, *Constitutional Principles for Europe*, Oxford, 2010, which offers a systematic account of the most essential legal rules of the European legal order, with the purpose of identifying and elucidating its principles, settled case law, and established constitutional theories and doctrines.

³⁴ The United States has complained of chronic European free-riding: namely, the tendency of its allies to obtain the benefit of the American nuclear umbrella and military power “free of charge”, without developing adequate autonomous operational and deterrence capabilities. On this issue, see ANDREATTA, *Autonomia strategica e politica industriale in un ordine geopolitico frammentato: le ragioni di una risposta europea*, in *Stato e mercato*, 2025, p. 253 ff.

I shall explain below, has called upon Europe to assume primary responsibility for the defence of the European continent.

Indeed, the tycoon has suggested that he no longer regards the organisation as the cornerstone of an indissoluble alliance among the countries situated on the two shores of the Atlantic. His position is clearly apparent from the threat to “leave NATO”, which he has employed in order to induce European countries to accept an increase in the relevant military expenditure.

Particularly significant are the doubts he has expressed regarding the automatic applicability of Article 5 of the North Atlantic Treaty, which call the stability of the Alliance into question.^{35 36}

To this must be added the statement made in an interview with *The Telegraph*, in which he described NATO as “a paper tiger”, adding that “Vladimir Putin knows it too”. Although those words reflect his resentment towards the European allies for their refusal to assist the United States in reopening the Strait of Hormuz,³⁷ they nevertheless reveal a changed reality when compared with that underlying the Atlantic Alliance, which was created within a framework of cooperation and mutual respect between the two shores of the Atlantic.

The President’s business mentality leads him to regard the Alliance as a relationship that does not serve American interests, since it is disproportionately favourable to the European States, whose contribution towards the expenditure required to sustain a technologically advanced and substantial military apparatus is inadequate.

³⁵ See the editorial entitled *Trump minaccia di lasciare la Nato, “meno aiuti all’Ucraina”*, 9 December 2024, available at: <https://www.ansa.it/sito/notizie/mondo/europa/2024/12/08/trump-zele-nsky-vuole-un-accordo-con-mosca-dcfe30e2bbcf>.

³⁶ See the editorial entitled *Trump mette in dubbio l’articolo 5 della Nato e crea tensioni sulla difesa collettiva in Europa*, 27 June 2025, available at: www.unita.tv/spettacolo/trump-mette-in-dubbio-larticolo-5-della-nato-e-crea-tensioni-sulla-difesa-collettiva-in-europa.

³⁷ See the editorial entitled *Trump: Alleati codardi*, in *la Repubblica*, 21 March 2026, which reports the President’s statement following the allies’ failure to assist in reopening the Strait: “I trust Putin more”.

Consequently, Trump's programme is directed, first, towards restoring financial balance among the participants, which translates into a demand for a higher economic contribution from each EU Member State. This objective is to be achieved in accordance with a plan presented in Brussels -and subsequently defined at The Hague- by Secretary General Mark Rutte to the thirty-two NATO countries. Under that plan, within the next ten years, the contribution made by each State must reach 3.5 per cent of GDP in respect of expenditure devoted exclusively to increasing defence capabilities, together with a further 1.5 per cent for investments related to security and defence.³⁸

The effort made by Europe to accommodate Trump's demands would, however, soon prove insufficient in his eyes. This became apparent during the war launched by the United States against Iran and the subsequent occupation of the Strait of Hormuz by the Islamic Republic.

Indeed, disregarding the defensive nature of the North Atlantic Treaty, as clearly indicated by Article 5 - which provides that "the Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all"³⁹ - the American President expected to be able to treat NATO countries as unconditionally subject to his *desiderata*. He therefore took it for granted that the United States would be entitled to use the airspace and military bases of its allies for operations connected with the conflict in the Middle East, a

³⁸ See CARUSO, *Nato verso il 5%. Così i ministri della Difesa preparano la svolta dell'Aia*, 5 June 2025, available at: <https://formiche.net/2025/06/nato-verso-il-5-cosi-i-ministri-della-difesa-prepara-no-la-svolta-dellaia>. See also the editorial entitled *Nato spinge sul 5% per la difesa. Crosetto: "Non prima del 2035"*, 5 June 2025, available at: https://www.ansa.it/sito/notizie/mondo/2025/06/05/nato-spinge-sul-5-per-la-difesa.-crosetto-non-prima-del-2035_73122954-8cd0-4b9c-98a8-8386ad53017f.html.

³⁹ See COLOMBO, *Una tigre di carta o un leone di ferro?*, available at: <https://www.med-or.org/news/una-tigre-di-carta-o-un-leone-di-ferro>. The essay reproduces the relevant passages from the interview mentioned in the text.

demand that was rightly rejected by certain EU countries.⁴⁰

This explains the American President's disappointment. Consistently with a conviction that had already become settled over time, he regarded that refusal as an additional reason for concluding that the conditions necessary for an effective Atlantic Alliance no longer existed.

He consequently declared himself prepared to reconsider the United States' membership of the Alliance. In all probability, this decision reflects Trump's belief that NATO's underlying purposes - collective defence, crisis management and cooperation in the field of security - have ceased to exist.⁴¹ His relationship with Putin may be presumed to have reinforced that conviction. Judging by the warm welcome extended to the Russian President during their meeting in Alaska on 15 August 2025, that relationship has undoubtedly contributed to diminishing the traditional hostility of the United States towards Moscow.⁴² A further consideration is the desire to remove possible obstacles to the implementation of Trump's programme of territorial expansion towards Greenland.

Secretary of State Marco Rubio also appears willing to endorse that course of action, having stated on Fox News that "we shall have to reconsider NATO's value to our country within the framework of the Alliance".⁴³ In a similar vein, the Secretary "for War", Peter Hegseth, gave more concrete expression to Trump's position by setting out the strategic vision which the United States Administration intends to follow. He invited the partners to "learn to fight on their own" and stated

⁴⁰ See the editorial entitled *L'Europa e gli aerei Usa: in Spagna è stop, da Londra autorizzazioni condizionate*, available at: <https://www.ilsole24ore.com/art/l-europa-e-aerei-usa-spagna-e-stop-londra-autorizzazioni-condizionate-AITo56GC>.

⁴¹ To the same effect, see BONI, *Il giorno dopo la Nato*, in *Limes*, *Lo scisma d'Occidente*, no. 4, 2026.

⁴² At that meeting, the American public perceived a degree of mutual admiration between the two leaders. Indeed, in a survey conducted at the time, 54 per cent of respondents expressed the view that Trump was excessively friendly towards Putin; see Reuters-Ipsos, 18 August 2025.

⁴³ See the editorial entitled *Rubio: gli Usa dovranno "riesaminare" il loro rapporto con la Nato*, available at: https://www.ansa.it/sito/notizie/topnews/2026/04/01/rubio-gli-usa-dovranno-riesamina-re-il-loro-rapporto-con-la-nato_7fece3c4-e148-4f1a-a3f0-7a8bd5249d58.html.

that “there is no real alliance if countries do not stand by you when you need them”.⁴⁴

4. In order to understand Trump’s attitude towards the allies, reference must be made, on the one hand, to the negotiating (*rectius*, business-oriented) rationale governing his decisions and, on the other, to the conduct which, consistently with his position of supremacy, he expects NATO member countries to adopt.

From this perspective, it is evident that he believes today’s Atlantic Alliance no longer corresponds to the “Pact” concluded in 1949 among the countries situated on the two shores of the Atlantic, which was intended to establish a political and strategic community founded upon common interests, solidarity and genuine reciprocity.

In his view, NATO is instead treated as a synallagmatic, almost private-law relationship, under which those who pay obtain protection, whereas those who do not pay forfeit their entitlement to the solidarity of their allies. We are therefore witnessing a genuine conceptual transformation of the Alliance, rather than a mere demand for increased financial contributions: an institutional rationale is being replaced by a transactional one.

It follows that the Alliance is no longer regarded as a permanent political commitment, since that commitment is replaced by a relationship capable of being renegotiated whenever necessary. In this context, the duty to provide assistance is implicitly made conditional upon the proper economic conduct of NATO’s members.

In my view, this approach represents a genuine break with the Atlantic tradition. Its full significance becomes apparent when account is taken of the fact that the tycoon, on the basis of the considerations set out above, appears to

⁴⁴ See COLOMBO, *Una tigre di carta o un leone di ferro?*, cited above, which reproduces the statements referred to in the text.

conceive of the Alliance as an American economic investment.

Accordingly, from his reference to the decades during which the United States allegedly bore costs for which it was not responsible - thereby enabling the Europeans to allocate resources to welfare and economic development rather than to defence - he derives the conviction that there exists a “historical credit” against the allies that must now be recovered.

This leads to the construction of a “new legal category” through which the Alliance may be understood by reference to creditor claims capable of being invoked by States against one another at the international level. Until now, such a category has not formed part of international law, since the expression in question represented a political formula employed to interpret the outcomes of certain forms of cooperation.

Lastly, it should not be overlooked that Trump’s conception of the Alliance appears to be characterised by a marked asymmetry in decision-making, under which the allies are required to demonstrate a degree of alignment far more extensive than that contemplated by the traditional principle of parity. Consequently, when the position currently occupied by the European allies in the eyes of the American partner is assessed in substantive terms, it may readily be concluded that they are regarded as subordinate countries and, as such, required to comply with every demand made by the United States.

It follows that the manner in which the American President is addressing the future relationship among NATO member countries is intended to bring about a radical departure from the policies pursued by his predecessors.⁴⁵ In all probability,

⁴⁵ Trump’s return to the White House in 2025 revived the debate concerning so-called burden-sharing and the possible reduction of the American commitment in Europe. See, *ex multis*, TOCCI, *Il disimpegno dell’amministrazione Trump dalla sicurezza europea*, available at: <https://www.affarinternazionali.it/il-disimpegno-dellamministrazione-trump-dalla-sicurezza-europea>; MURGIA, *The European Pillar of NATO in the Era of US Disengagement*, published in 2026 by the Istituto Affari Internazionali (IAI).

he intends to move towards a system of burden shifting, embodied in a new form of strategic relationship within the organisation. Under that prospective arrangement, the United States would no longer bear the financial burden of military expenditure, which would instead fall upon the European allies, together with primary responsibility for the management of conventional defence and regional security.⁴⁶

In assessing American foreign policy and the profound upheaval caused by Donald Trump's rise, numerous scholars have questioned the role of the United States in a world currently permeated by a degree of uncertainty not experienced for many decades.

They have sought answers to questions concerning the position of the United States in the world and the consequences that the international community may face if the assertive international strategy pursued by the present American President continues for a prolonged period. Among these questions, those raised by Hal Brands appear particularly significant: he has asked whether America is moving towards irreversible decline or whether it remains capable of preserving its superiority within an increasingly competitive and hostile international environment.⁴⁷

A problem is thus posed which, unlike many works devoted exclusively to Donald Trump, situates his presidency within a broader reflection upon American grand strategy, demonstrating that the tensions emerging during the tycoon's era can be traced to a longstanding debate concerning the global role of the United States.

In my view, this approach provides useful support for the proposition

⁴⁶ See MACKENZIE, *Spending Isn't Enough: NATO Needs Burden Shifting*, April 2026, available at <https://americansforprosperity.org/policy-corner/spending-isnt-enough-nato-needs-burden-shifting>. The essay examines the new distribution of senior command roles within NATO's structure, which transfers greater responsibilities to Europe.

⁴⁷ See BRANDS, *American Grand Strategy in the Age of Trump*, Brookings Institution Press, 2018.

advanced above, according to which Trump should be regarded as a powerful accelerator of strategic transformations already under way. In the present geopolitical context, characterised by the transition from a rules-based order to one founded upon power relations, the NATO question constitutes one of the most emblematic manifestations of this phenomenon.⁴⁸

The foregoing observations concerning the manner in which the present American President regards the Atlantic Alliance - as if it were a private-law relationship - must therefore be supplemented by emphasising that, in concrete terms, he has reduced NATO to an instrument of American power politics.

Hence the transformation of the Alliance from a legal and political institution into a strategic relationship conditioned by the national interests of the United States. From this perspective, Trump's conception of the Atlantic Alliance may be regarded as entirely consistent with the crisis of multilateralism and the progressive weakening of the international order founded upon shared rules.

5. The climate of tension thus created with the allies of the Atlantic Pact might suggest that the expressions of disappointment concerning NATO will soon be followed by concrete action. This conclusion is supported by the recent conduct of the United States following a Russian attack upon Romanian territory, which struck a building and injured two people.

That reckless action provoked a widespread international response from the States belonging to the Atlantic Alliance, which condemned the incursion and expressed their solidarity with and closeness to their Romanian ally. By contrast, no official support was forthcoming from the American Government. The only expressions of support came from the United States Ambassador to NATO - who

⁴⁸ See KEOHANE, *The United States and the Postwar Order: Empire or Hegemony?*, in *Journal of Cold War Studies*, 2006, vol. 8, no. 4, pp. 105–117. The article reflects upon the dynamics of power between the United States and its European allies, showing that the Atlantic Alliance, while formally retaining a cohesive structure, is traversed by systemic tensions.

“condemned” the incursion - and from certain members of Congress.⁴⁹

We are therefore confronted with a situation that foreshadows a future fraught with uncertainties regarding the continuity of the Alliance.⁵⁰ It is clear that NATO cannot continue to operate according to the forms of participation it has retained for more than seventy years. At the same time, however, it appears extremely difficult for the United States to withdraw from NATO, since it constitutes the Alliance’s driving force.

This conclusion is reinforced by the factual conditions that would make such an eventuality particularly complex for the United States: the actual implementation of such an intention is constrained by the rigid legal framework governing the organisation.

I refer, in particular, to the procedure prescribed for withdrawal from NATO. Under Article 13 of the North Atlantic Treaty, a country other than the United States may withdraw “one year after its notice of denunciation has been deposited with the Government of the United States of America, which will inform the Governments of the other Parties”.

The possible withdrawal of the United States is more complex. The National Defense Authorization Act, adopted in 2023, additionally requires either the approval of two-thirds of the Senate or, alternatively, the adoption of a specific resolution by Congress. It follows that the President cannot unilaterally order the United States’ withdrawal from NATO.

In my view, however, this conclusion is subject to uncertainty in the present case, essentially because of the conduct and fluctuations in decision-making that ordinarily characterise Donald Trump’s actions. It must be observed in this respect

⁴⁹ See SIRI, *La tiepida reazione degli Stati Uniti. Solo l’ambasciatore condanna l’attacco*, in *La Stampa*, 30 May 2026.

⁵⁰ In this regard, see the observations - from which a cautious optimism appears to emerge - of KAPLAN, *Origins of NATO: 1948–1949*, in *Emory International Law Review*, 2019, p. 11 ff., especially p. 28.

that, were he genuinely determined to withdraw, he would not hesitate to disregard the applicable statutory provisions, as he has already done on other occasions, thereby demonstrating that he is unwilling to abandon or modify his programmes.⁵¹

That being so, the fact that the Republicans do not currently possess the two-thirds majority in the Senate required to approve the United States' possible withdrawal from NATO would probably not constitute an effective obstacle for the tycoon.

Indeed, if Trump were unwilling to relinquish that objective, he would undoubtedly invoke the special powers conferred upon him by the Constitution in matters of foreign policy, in his capacity as Commander-in-Chief of the Armed Forces. Were resistance to be encountered, he would also be prepared to bring the matter before the Supreme Court.

Europe is confronted with several urgent questions: are the threats made by the head of the American Executive credible? If they were to be confirmed by subsequent action, what should Europe do? How should it respond to such a situation?

On closer examination, the credibility of these threats might appear to be supported by the fact that they represent the culmination of a long series of criticisms and expressions of disapproval directed by Trump towards the European allies. They must therefore be placed within the broader policy of disengagement from Europe that he has pursued, both by transferring significant American military

⁵¹ Significant in this regard is Trump's conduct during the first war against the Islamic Republic, which the tycoon commenced without anyone's knowledge, even refraining from informing the United States Congress that he intended to bomb Iran's nuclear facilities. See the editorial entitled *Attacco all'Iran, i dem Usa: "Trump non ha chiesto l'ok al Congresso". Era già accaduto in Afghanistan e Iraq*, available at: <https://www.ilfattoquotidiano.it/2025/06/22/trump-attacco-iran-congresso-costituzione-news/8035362>.

contingents from the “Old Continent” to the Indo-Pacific⁵² and by entrusting the EU countries with full responsibility for supporting Ukraine.⁵³

Nevertheless, *melius re perpensa*, I do not believe that these fears are well founded, if account is taken of what may reasonably be assumed to constitute the tycoon’s true *desiderata*. Bearing Donald Trump’s habits in mind, it cannot be overlooked that he approaches matters of State according to the criteria governing commercial negotiations and, therefore, in accordance with a business-oriented rationale.

It may consequently be inferred that the prospect of “withdrawing” from the Alliance is relatively unlikely. The objective pursued appears instead to be a substantial transformation of NATO’s operation, to be achieved by employing the threat of withdrawal instrumentally in order to intimidate its member States.

Withdrawal is therefore not the objective he pursues; it constitutes merely the means through which he seeks to impose a different interpretation of the Treaty. The wording would remain unchanged, whereas the meaning attributed to certain fundamental provisions - first and foremost the collective-defence clause - would be altered.

A preliminary conclusion may therefore be drawn: in all probability, Trump is not a President hostile to NATO. He does not wish to abolish it, but to transform it radically, converting it from an alliance founded upon political and strategic solidarity into an organisation based upon the principles of exchange and national advantage, in which American protection is made conditional upon the allies’ economic and military contributions. From a legal and institutional perspective, it is

⁵² See the editorial entitled *Trasloco Usa nel Pacifico, le truppe per la Nato da Europa e Canada*, 8 June 2025, available at www.repubblica.it/esteri/2025/06/08/news/spese_militari_ue_nuova_nato_usa_spostano_80_mila_soldati.

⁵³ See the editorial entitled *Ucraina: l’Europa ci riprova, senza Trump*, 3 March 2025, available at <https://www.ispionline.it/it/pubblicazione/ucraina-leuropa-ci-riprova-senza-trump-202019>.

precisely this transformation of the concept of alliance that constitutes the most innovative and significant feature of the matter under examination.

6. The conclusion advanced above makes it possible to reject the proposition that the historical transformation currently affecting NATO is determined by Trump's intention to "colonise" Europe - an expression possessing considerable evocative force. In its historical sense, colonisation entails the loss of the political sovereignty of the territory subjected to foreign rule, a circumstance that plainly does not arise in the relationship between the United States and Europe. If, however, the term is employed metaphorically to denote increasing economic, strategic and technological subordination, certain objective elements may support that proposition, although it remains open to question.

First, on the basis of what has already been said, Donald Trump regards the Alliance differently from his predecessors. From Harry S. Truman to Joe Biden, American Presidents had presented NATO as a security community founded upon shared interests. Trump, as indicated above, instead tends to describe it as an essentially contractual relationship in which the United States provides protection and the Europeans are required to pay its price. This is a cultural transformation even before it is a political one.

Secondly, increased European military expenditure produces economic benefits for the United States defence industry. The growth of investment in this sector by EU countries is occurring at a time when European industry is unable to meet the demand for weapons; a significant proportion of purchases will therefore continue to be made from the major American manufacturers. This creates a form of technological and industrial dependence that strengthens the influence of the United States.

A further relevant consideration concerns the decision-making methods through which Trump approaches the "NATO question". He appears to conceive of

American leadership not as the pursuit of consensus but as the exercise of a dominant position, adopting an approach in which hierarchical relations prevail over cooperation.

At the symbolic level, an analogy emerges with the Roman Empire, which - unlike the United States, which possesses no legal authority over its allies - exercised direct sovereignty over its provinces, appointed governors, collected tribute and held a monopoly over the use of force.

That analogy becomes considerably more persuasive if reference is made to the concept of hegemony developed in political theory and international relations. A hegemonic power does not necessarily govern through military occupation.

It governs because others depend upon it for security, technology, finance, information and access to markets. From this perspective, Trump demonstrates an intention to pursue a form of hegemony that is more explicit and less concealed than that exercised by his predecessors.

After 1945, the United States undoubtedly occupied a dominant position in relation to Europe, but that position was legitimised through multilateral institutions and shared rules. Trump, by contrast, tends to diminish the role of institutions and to favour bilateral power relations, once again in accordance with the Roman principle of *divide et impera*.

Hence the substantial transition from consensual to conditional leadership. For approximately eighty years, the United States led the West by providing international public goods: security, monetary stability and open trade. In return, it obtained prestige, influence and consent. The tycoon instead asserts a different principle: American protection no longer constitutes a public good, but a service requiring an economic and political counter-performance.

It is evident that, in pursuing the economic and financial objectives identified above, Trump appears to adopt a rationale much closer to the relationship between protector and protected than to that existing between allies.

Accordingly, although it must be accepted that this does not constitute colonisation in the classical sense of the term, it must also be recognised that Europe risks becoming strategically dependent upon the United States. Indeed, Europe is investing vast resources in its own defence, yet continues to depend upon others for technology, intelligence, the most advanced weapons systems, nuclear deterrence and, to a considerable extent, political and strategic direction.

In my view, the term “colonisation” may possess heuristic force if it is understood not in its historical and legal sense but as a metaphor for increasing strategic, economic and decision-making subordination. It is therefore not unreasonable to suggest that the most recent positions adopted by the Trump Administration towards NATO are capable of being interpreted in this manner.

From this perspective, the Atlantic Alliance would cease to constitute a security community founded upon solidarity among allies and would progressively assume the characteristics of an instrument through which the United States consolidates its position of pre-eminence over Europe.

This would plainly not entail a loss of the allies’ legal sovereignty, but it could result in a significant restriction of their decision-making autonomy. In conclusion, therefore, it may be said that the objective pursued by the Trump Administration does not appear to be the political colonisation of Europe, but rather the restructuring of transatlantic relations according to a hierarchical rationale, in which the continuation of American protection is made conditional upon the European allies’ increasing economic, industrial and strategic dependence.

To draw once again upon an image offered by the Roman Empire, reference may be made to the system of the *regna socia et amica populi Romani*. Under that system, local rulers formally remained upon their thrones and retained their own institutions, but were bound by Rome’s foreign policy, paid tribute or supplied military contingents, and enjoyed no genuine strategic autonomy.

Similarly, Europe would not lose its formal sovereignty: it would retain its

governments, parliaments and constitutional orders. Nevertheless, if its security, military supplies, strategic technologies and even its principal geopolitical decisions continued to depend to a significant extent upon the United States, its substantive autonomy could be constrained.

There can be no doubt that certain choices made by the Trump Administration appear to be moving in this direction. If this consideration is transposed to the present historical phase, characterised by the transition from a multilateral order to one founded upon power relations, the metaphor of “colonisation” outlined above acquires systemic coherence.

Indeed, it does not describe territorial occupation, but rather the transformation of the Alliance into an asymmetrical relationship of dependence, in which the stronger party increasingly determines the conditions under which the weaker party may exercise its freedom of choice.

7. In this context, it is also necessary to consider the sense of disorientation that clarification of the tycoon’s true intentions may create within the EU countries, which remain uncertain as to the course they should follow. They are confronted with the undeniable weakening of the Alliance, which, once deprived of the American umbrella, would undoubtedly be militarily unprepared.

A situation of unavoidable chaos may therefore be envisaged, principally because the European Union lacks a unified approach to the matter—an indispensable prerequisite for adopting a decision capable of adequately safeguarding the Union’s security against the possible threats posed by foreign powers seeking to take advantage of its weakness.

The fact that, to date, the project for an autonomous common defence has not been supported by all EU countries - and has even been opposed by the Italian Prime Minister - will undoubtedly contribute to this climate of uncertainty and to

the consequent difficulty of adopting the necessary decisions.⁵⁴

Europe will therefore be confronted with an alternative: either to remain in its present position of subordination to Trump, hoping that, amid his continual reversals, he will soon retreat from his current position; or to decide to assume autonomous responsibility for its own security. Underlying the former expectation is naturally the hope that, once again, this is merely a bluff, characteristic of the strategy adopted by the head of the American Executive, intended to intimidate the Europeans, weaken their aspirations to freedom and render them more readily subject to his wishes.

It follows that, should this expectation not be fulfilled, the tycoon will continue to pursue his policy of domination and to impose upon the “European traitors” unacceptable demands that extend beyond the defensive rationale underpinning the Atlantic Alliance - demands which, inevitably, they would be unable to resist.

In analysing this situation, the studies conducted by the Istituto Affari Internazionali (IAI) and the European Union Institute for Security Studies (EUISS) converge in maintaining that the reinforcement of NATO’s European pillar and the debate concerning Europe’s strategic autonomy are accelerating.⁵⁵

There can be no doubt that, should the present American approach to the matter persist, the European Union would find itself in the unwelcome position of assuming greater responsibility without obtaining greater decision-making autonomy, thereby creating an even more unbalanced NATO.

Indeed, Europe would pay more and assume greater risks, while continuing

⁵⁴ See the editorial entitled *Meloni dice no all'esercito europeo: non serve un doppione dell'Alleanza*, in *Il Sole 24 Ore*, 25 June 2025. The article reproduces the Prime Minister’s statement that “the Western defence system is founded upon NATO, within which there is no single army, but national armies that cooperate with one another”.

⁵⁵ See Istituto Affari Internazionali, *The European Pillar of NATO in the Era of US Disengagement*, 2026.

to depend upon American political and strategic command. This would mark a transition from burden-sharing to responsibility-sharing that would be destined to become permanent.

By contrast, the correct formula for the emerging reality should not be: “Europeans must spend more within a NATO that remains American”; rather, it should be: “Europeans must assume greater burdens, but must also acquire greater powers of direction, command and planning, together with increased industrial capacity and political decision-making authority”.

It is no coincidence that the aforementioned IAI study observes that strengthening the European pillar requires common capabilities, industrial integration, reduced dependence upon United States systems and greater European influence within the chain of command.⁵⁶

It is evident that, in such a context, the only coherent response would be to promote the unity of the European Union and to secure an agreement establishing the guiding principles of a European-led “military alliance”. Such an alliance would respond to the need - long perceived by certain European democracies - to achieve a form of “European security ... [to be regarded as] ... indispensable”. In the past, this was envisaged as necessary in order to “support NATO” adequately;⁵⁷ today, however, it might be invoked with a view to replacing NATO’s function.

From a logical and systemic perspective, the appropriate course would be the Europeanisation of NATO, which, in my view, should be pursued subject to certain qualifications.

It must first be emphasised that, at least in the short term, neither the withdrawal of the United States from the Atlantic Alliance nor its replacement by

⁵⁶ See Istituto Affari Internazionali, *The European Pillar...*, cited above.

⁵⁷ See the editorial entitled *Draghi al vertice Ue di Versailles: “Non siamo in economia di guerra, ma è bene prepararsi”*, 11 March 2022, available at: <https://www.rainews.it/articoli/2022/03/draghi-vertice-ue-di-versailles-non-siamo-in-economia-di-guerra-ma-bene-prepararsi-096baab2-c437-42eab14096d921d15ced.html>.

an immediately self-sufficient European army can realistically be envisaged. The objective should instead be to transform NATO from an American-led alliance into an alliance resting upon two pillars: an American pillar and a European pillar. In this regard, the Jacques Delors Institute has rightly emphasised the need for greater coordination, increased visibility for the European Union and more substantial EU representation at NATO summits.⁵⁸

Accordingly, if the European countries, having acknowledged the situation described above, were prepared to adopt a resolute position while preserving their commercial and functional cooperation with the United States, European defence should be released from political dependence upon the latter - a dependence otherwise destined to become an obligation of outright submission.

Naturally, such a course of action presupposes that Europe will attain the political maturity necessary to understand that its evolutionary process cannot come to an end with a Union whose practical function is exhausted within the economic and financial sphere and, therefore, in the creation of a regulatory and technocratic apparatus associated with the achievement of that objective.

In such circumstances, the position recently adopted by Trump would prove beneficial, since it would act as a catalyst for the revival of the European spirit which, in recent years, appears progressively to have diminished, notwithstanding geopolitical events that should have strengthened it - most notably the war between Russia and Ukraine and the conflicts devastating the Middle East.

This has caused disappointment and frustration among those - myself included—who refuse to accept a situation in which the “European dream” founders upon the shoal of intergovernmental interests. Those interests remain divergent and are therefore unable to merge and unite in pursuit of the common good of the EU countries.

⁵⁸ See TARDY, *The European Pillar of NATO*, Paris, Jacques Delors Institute, January 2025.

8. Although the prospect of a Europeanisation of NATO described above is entirely sustainable, it can be realised only if account is taken of the fact that genuine European strategic autonomy, if pursued to its logical conclusion, should lead not only to such an outcome but also to the establishment of a European federal structure at the political and institutional level.

Without a European political centre capable of taking decisions concerning defence, autonomy remains merely technical, industrial or rhetorical; it does not become an expression of sovereignty.

Accordingly, given the present situation among the countries of the Union, the implementation of this project risks amounting to little more than *wishful thinking*. It would first be necessary to overcome the disagreements arising from the possibility of limiting national sovereignty⁵⁹ and, subsequently, to move beyond national sovereignty altogether through the creation of the desired political federation.

In the changed political climate surrounding these developments, it is nevertheless reasonable to assume that the conditions may emerge for a common strategic vision within the Union, it being understood that cooperation in matters of military defence has long been unanimously regarded as a necessity in Europe.

I also consider that reference to the total military expenditure currently borne by the EU States may assist in this regard. It should be borne in mind that, as technical analyses have demonstrated, those costs would be substantially reduced if a unified EU “armed force” were established, principally through the coordination

⁵⁹ This might occur if troops belonging to a unit under multinational command were deployed in a mission which the Government of their State did not regard as appropriate or useful, thereby creating the possibility of conflict.

of existing forces.⁶⁰

There is likewise an awareness of the risks of a different nature arising, on the one hand, from the Union's present lack of an adequate military-defence system - caused by delays in developing suitable technological capabilities - and, on the other, from the emergence of an asymmetry of power within the European Union. Such an asymmetry could result from Germany's position: a country with an inherent military vocation and presently willing to rearm, with military expenditure financed through special funds and flexibility arrangements approaching EUR 100 billion in 2026.

In this respect, it is appropriate to recall the celebrated phrase used by NATO's first Secretary General, Lord Hastings Ismay, to identify the three pillars upon which the organisation's structure rested. The famous words "to keep the Americans in, the Russians out and the Germans down" are not merely a felicitous turn of phrase; they also encapsulate the precise geopolitical equilibrium established after the Second World War.

Those words indicate that NATO was established to pursue three objectives simultaneously: (a) to guarantee the permanent presence of the United States in Europe; (b) to contain Soviet expansionism; and (c) to prevent Germany from once again becoming an autonomous military power.

This was an equilibrium in which each of the three elements presupposed the other two. Accordingly, if the United States progressively reduces its leadership role and asks the Europeans to assume primary responsibility for the security of the continent, that development will inevitably have repercussions upon the third pillar

⁶⁰ See the editorial entitled *Cottarelli: 800 miliardi in armi sono troppi, rischiano di far aumentare per l'Italia il rapporto tra debito pubblico e Pil*, available at <https://www.ilfattoquotidiano.it/2025/03/16/riarmo-europa-cottarelli-armi-debito-pil-dazi-trump/7915896>. The article reproduces the economist's statement: "Italy remains below 2 per cent of GDP, which was the commitment we undertook ten years ago. We are still at 1.6 per cent; adding one and a half percentage points to the present level would take us above 3 per cent. Italy has not recorded military expenditure of 3 per cent since the mid-1960s".

identified by Ismay. The German question, which appeared to have been definitively settled after 1990, may therefore re-emerge, undermining the equilibria that the previous system was intended to preserve.

Of particular relevance is the paradigmatic change in the basis upon which Germany has constructed its authority. After decades during which its position rested principally upon its economic strength, Germany is now preparing, in all probability, to become the leading military power in continental Europe.

In my view, however, a qualification is necessary. I do not believe that Germany as such should be regarded as a source of danger, since it is now a constitutional State fully integrated into the legal order of the European Union, possessing consolidated democratic institutions and respecting the legal constraints imposed by the Union.

Consequently, if German rearmament were to develop within a genuine European federation - with a federal Government, a European Minister of Defence, a Parliament possessing full supervisory powers and a unified foreign policy - German military power would cease to be "German" and would become the military power of the European Federation.

An institutional problem would arise, by contrast, if Europe, in the present circumstances, confined itself to increasing the military capabilities of the individual States while retaining an essentially intergovernmental structure. In that event, Germany would inevitably become the continent's principal strategic decision-maker, not as the result of a deliberate political choice, but simply by reason of the weight of its economy, industry and military capabilities. This could lead to the circumvention of the European budgetary rules and to an imbalance within the Franco-German axis, opening the way, in a pessimistic scenario, to nationalist tendencies or strategic competition with France.⁶¹

⁶¹ See, *ex multis*, the editorial entitled *I rischi del riarmo tedesco – L'urgenza di nuovi equilibri nella*

It may therefore be said that the Europeanisation of NATO can constitute an equilibrating factor only if it reflects a prior Europeanisation of political power.

Otherwise, the transfer of responsibilities from the United States to Europe risks resulting not in the assertion of European sovereignty but in the emergence of new national hegemonies within the continent.

I would also add that the integration of Ukraine into the European Union could constitute a particularly significant asset for strengthening the Union's security capabilities. Ukraine possesses armed forces that, through the experience acquired in the war against Russia, have developed some of the most advanced contemporary operational expertise in the use of unmanned defence systems.⁶²

Hence the recent invitation issued by the European Commission "to submit expressions of interest in becoming founding members of the EU–Ukraine Drone Alliance".⁶³ This initiative is important not only from a military perspective but also as an instrument for integrating the European defence industrial base.⁶⁴

In light of these advantages, the Union should simultaneously facilitate and accelerate Ukraine's accession to Europe, "even from a self-interested perspective focused more upon our own interests than upon those of Kyiv", as has been observed in this regard.⁶⁵

coppia franco-tedesca e in Europa, available at <https://bedaromano.blog.ilsole24ore.com/2025/03/30/i-rischi-del-riarmo-tedesco-lurgenza-di-nuovi-equilibri-nella-coppia-franco-tedesca-e-in-europa>. The article underlines the change of direction undertaken by Germany, which has been positively received by its population. More specifically, it points out that, by amending its Constitution and incurring new debt in order to invest in defence, Germany "is assuming political and economic responsibilities that it had avoided for decades".

⁶² See the editorial entitled *L'Ue pronta ad aprire a giugno i primi capitoli per l'adesione di Kiev*, available at <https://www.ilsole24ore.com/art/l-ue-pronta-ad-aprire-giugno-primi-capitoli-l-adesione-kiev-AIsvOsJD>.

⁶³ See the editorial entitled *Nuova Alleanza UE-Ucraina per i droni: la Commissione lancia invito per diventare membri fondatori*, available at <https://www.aise.it/unione-europea/nuova-alleanza-ue-ucraina-per-i-droni-la-commissione-lancia-invito-per-diventare-membri-fondatori/232267/115>.

⁶⁴ Unfortunately, the security system remains dependent upon infrastructure supplied by private American entrepreneurs who own and control the relevant information-technology mechanisms, including, for example, Elon Musk and Palantir Technologies.

⁶⁵ See MINZOLINI, *Kiev ha meritato sul campo l'ingresso nell'Unione europea. E conviene a tutti*

Significant political resistance to Ukraine's accession nevertheless persists within certain Member States, including Italy. This reflects differing conceptions of the process of European integration and of the strategic priorities that the Union should adopt.⁶⁶

I am aware that other considerations, similar to those advanced in political debate, could obstruct the adoption of an approach that appears attributable to a reconstructive interpretation of European reality.⁶⁷ I nevertheless consider it appropriate to emphasise that, for the first time, the process of European integration would be driven not only by the objective of economic unification but also by the construction of a common strategic capability, which would in turn reinforce the path towards more complete political integration.

The experience acquired by Ukraine in its conflict with Russia therefore prompts reflection upon an aspect likely to assume increasing importance in the

(*anche a noi*), editorial published in *Il Giornale*, 31 May 2026, which invites the Italian Prime Minister and the other European leaders to “take account of the exceptional times in which we are living”.

⁶⁶ See the editorial entitled *L'Ucraina nella Ue: la Lega è contraria e il Governo si spacca*, available at https://www.avvenire.it/politica/lega-assolutamente-contrari-allingresso-dellucraina-nellue_108945.

⁶⁷ I refer to the epistemological and methodological limitations characterising the hypothesis of a “unitary reconstruction” of European reality. Such a reconstruction presupposes that a homogeneous theoretical model can be applied to a fragmented reality. The resulting conceptual obstacles are represented by: (a) the inadequacy of universal models, which are unable to explain or govern the dynamics of regions possessing radically different structures; and (b) the principle of “systemic complexity” characterising European reality, since applying that criterion would require local specificities to be disregarded, resulting in an abstract model that does not correspond to concrete reality.

To these considerations must be added economic and structural barriers which, even in the absence of political vetoes, affect the process of unification. That process may encounter objective asymmetries caused by divergent productive models: Europe encompasses economic systems founded upon large-scale technological manufacturing, economies driven by financial services, and economies heavily dependent upon tourism or agriculture. A unitary policy could undoubtedly favour one model to the detriment of another, thereby creating irreversible structural imbalances. Lastly, the process of European unification encounters structural impediments rooted in historical barriers arising from centuries of conflict and markedly different national identities. These are defined by religious pluralism deriving from Judeo-Christian roots, divergent geopolitical factors—including different geographical positions and the distinctive features of the various historical processes—and linguistic fragmentation, namely the numerous official languages of the European Union, which slows the creation of a single “European people”.

evolution of European integration. For the first time, the accession of a candidate State would not depend exclusively upon compliance with the Copenhagen criteria and the procedure laid down in Article 49 TEU, or upon the extension of the Union *acquis* - namely, the Treaties, regulations, directives and decisions adopted by the European institutions, together with the provisions of the Common Agricultural Policy - to a new national legal order. It would also depend upon that State's capacity to enrich the Union's own strategic assets.

Indeed, Ukraine, having developed - as I have already observed - operational capabilities of exceptional importance in the use of unmanned systems, electronic warfare, the integration of artificial intelligence into military operations, and the organisation of industrial supply chains directed towards the rapid production of dual-use technologies, possesses capabilities that could contribute to strengthening Europe's technological and industrial defence base and to reducing some of the Union's present vulnerabilities.⁶⁸

From this perspective, Ukraine's possible accession to the European Union would acquire a significance transcending the traditional paradigm of enlargement. It would constitute not merely the completion of a process of adaptation to the Copenhagen criteria and the *acquis communautaire*, but also a factor in the transformation of the Union itself. The latter would be called upon to incorporate into its institutional architecture a new dimension of security in which defence, technological innovation, industrial policy and productive autonomy are closely interconnected.⁶⁹

It follows that the construction of European security can no longer be

⁶⁸ See KOFMAN, *The Russian-Ukrainian War: Military Operations and Battlefield Dynamics*, essays published by the Carnegie Endowment for International Peace, 2022–2026; FREEDMAN, *Command: The Politics of Military Operations from Korea to Ukraine*, Oxford University Press, 2022.

⁶⁹ See HOWORTH, *Security and Defence Policy in the European Union*, 3rd ed., London, 2021; SAVASTANO, *Trasformazioni costituzionali nell'allargamento dell'Unione europea*, Turin, 2023.

considered exclusively from the perspective of increasing military expenditure or acquiring new weapons systems. It requires the progressive integration of industrial, financial, technological and military capabilities within a coherent framework of strategic cooperation.

From this perspective, an organisational model appears to be emerging which, in my view, may be described as one of “integrated autonomy”. This expression is intended to emphasise the Union’s progressive acquisition of an autonomous capacity for initiative and resilience, designed to strengthen, rather than replace, the transatlantic relationship.

The model does not envisage Europe’s disengagement from the Atlantic Alliance. Rather, it refers to the autonomy that Europe is able to achieve through the interaction among markets, finance, technological innovation and public power.

This is possible because institutional transformations do not depend exclusively upon legal or military factors. Indeed, the expression “integrated autonomy” precisely describes this interaction. It therefore represents not the ultimate purpose of European integration, but one of the instruments through which the Union may contribute, in a more balanced and responsible manner, to the security of the entire Euro-Atlantic community.⁷⁰

On closer examination, it may be said that we are confronted with a legal category that assists us in understanding how the Union’s autonomy does not coincide with its strategic self-sufficiency. This is because such autonomy is the outcome of a process intended to identify -as I have just emphasised- a security model founded upon the functional integration of Europe’s industrial, financial, technological and military capabilities. These factors are interrelated, while the framework of Atlantic cooperation is preserved.

⁷⁰ See EUROPEAN COMMISSION, *European Defence Industrial Strategy (EDIS)*, Brussels, 2024; DRAGHI, *The Future of European Competitiveness*, Report to the European Commission, 2024; BISCOP, *European Strategy in the 21st Century*, London, 2019.

Hence the prospect of an innovative formula for the alliance with the other shore of the Atlantic, which might be described as “post-Americanism”. By virtue of the relationships through which it is articulated, its content takes account of the historical and political context within which it has matured and which therefore constitutes the foundation of its origin.

9. As is well known, an important NATO Summit was held in Ankara at the beginning of July 2026.⁷¹ The information emerging from the Summit suggests that it unfolded in two stages: an initial phase marked by acute tensions and criticism directed towards certain allies, followed by a relaxation of those tensions after the Member States confirmed a significant increase in their financial commitments to defence.

At the same time, according to concordant sources, President Trump reaffirmed his intention to keep the United States within NATO, thereby neutralising his previous threats of disengagement. He went so far as to sign the following final declaration: “Russia represents a long-term threat to NATO, Ukraine contributes to transatlantic security, and the allies are united in their unwavering support for Kyiv in defending its freedom, sovereignty and territorial integrity”.⁷²

On closer consideration, I do not believe that the succession of harsh and conciliatory tones adopted by Donald Trump on that occasion should occasion surprise. They are consistent with the familiar style of conduct that distinguishes him, whereby moments of intense pressure alternate with gestures of openness. Rather, the true significance of the Summit should, in my view, be identified by

⁷¹ See the editorial entitled *Trump attacca la Nato, poi la salva. Intesa su art. 5 e aiuti a Kiev*, in *La Stampa*, 9 July 2026. The article reports that the American President initially attacked the allies, but subsequently signed the final declaration, stating: “There is love here”.

⁷² See the editorial entitled *Vertice Ankara, Trump: “Spagna cattiva, Italia buona”. E poi: “Nato unita, ci amiamo”*, available at <https://tg24.sky.it/mondo/2026/07/08/vertice-nato-ankara-trump-meloni-diretta>. The article reproduces the final declaration issued by the participants in the Summit.

assessing the possible consequences of its conclusion.

We must therefore ask: what happens if the Europeans assume an increasing proportion of the financial burdens of defence, while the political and strategic direction of the Alliance remains substantially concentrated in the hands of the United States?

This question recalls a general principle of public law and of the law of international organisations: responsibility must be accompanied by adequate decision-making authority. Consequently, if the burdens increase without a corresponding increase in the capacity to influence common decisions, an institutional imbalance may emerge. Naturally, this does not mean that such an imbalance has already materialised; rather, it means that it constitutes the subject of a legitimate question upon which the Ankara Summit invites reflection.

The increased assumption of financial and military responsibilities by the European allies renders particularly pressing the problem of Europe's decision-making autonomy in relation to possible military initiatives falling outside the collective-defence arrangements governed by the North Atlantic Treaty—one need only recall Trump's request for assistance during the war waged by the United States against Iran. The greater the contribution required of the allies, the more compelling becomes the need for their effective participation in the formulation of the Alliance's strategic decisions.

In this regard, consideration must be given to the rapidity with which the American President alters the dynamics of his political communication, with the inevitable and continual changes in his position. This undoubtedly has an adverse effect upon the consistency of his role as a major leader and, more generally, upon the reliability of the United States itself, while also making it particularly difficult for the allies to anticipate the evolution of the common strategy.

Hence the conclusion that the tycoon, driven by considerations unrelated to the common interests of the allies, has embarked upon a new form of relationship

with them which is destined to alter the original purposes underlying NATO, without at the same time considering the resulting need also to modify the institutional scheme devised when the Alliance was established. Moreover, it is evident that NATO has now entered a phase marked by the need to redefine the relationship among solidarity, burden-sharing and participation in decision-making. There can therefore be no doubt that, in the future, structural changes will have to be adopted within the organisation. Although those changes have not yet been clearly identified, they will undoubtedly alter its configuration.

We may therefore reach a conclusion. Through his turbulent conduct, frequently motivated by personal interest rather than by the pursuit of the common good, Donald Trump has set in motion a process that transcends both his intentions and the limitations of his deficient strategy. It follows that the European allies—if they are to avoid accepting a relationship of complete subordination to the United States and relinquishing the prerogatives and rights to which they are entitled—must address and resolve, within a short period, the problem of establishing a new distribution of powers and functions within NATO.

They must ensure that, in the future, when the United States may have another President whose style is entirely different from that now observed with apprehension in the present head of the American Executive, the question posed above will no longer remain unanswered: can a Western alliance exist in which the burdens are progressively rebalanced without a corresponding rebalancing of decision-making responsibilities?

One final observation may be added. In the specialist press and in writings concerning Donald Trump, it is frequently stated that he harbours a strong desire to “go down in history”. I cannot express a view upon that matter. I can, however, say that, irrespective of the intentions of the protagonists, certain leaders ultimately come to be remembered because they marked a turning point in international institutions. It is therefore possible that, many years from now,

scholars will identify in the events of the present period the beginning of a transformation in transatlantic relations. Should that occur, Trump may paradoxically be remembered for the impact that his presidency had upon the evolution of the system of Western alliances, rather than for the political turmoil and socio-economic upheavals that his conduct has generated in the present.

CHANGING GLOBAL PARADIGMS: ECONOMICS AND SCARCITY; INFORMATION AND COMMUNICATIONS TECHNOLOGY; AI AND HUMAN DIGNITY

Rainer S. Masera*

ABSTRACT: *This article explores the profound transformations reshaping contemporary economic and social paradigms under the impact of AI, robotics and Information and Communications Technology. It questions the traditional economic principle of scarcity and considers the possible transition towards abundance and superabundance, driven by unprecedented gains in productivity and technological development. Against this background, the analysis examines the evolution of ICT, the growing interaction between communication systems, artificial intelligence and robotics, and the resulting economic, social and geopolitical implications. Particular attention is devoted to the relationship between AI and human dignity, highlighting the need to ensure that technological progress remains consistent with fundamental human values and serves the common good. The paper ultimately outlines the opportunities, uncertainties and challenges involved in a possible long-term transition from scarcity to plenitude.*

SUMMARY: 1. Economics and Scarcity. - 2. The origin of AI. - 3. Information and Communications Technology. - 4. AI and Human Dignity. - 5. Concluding Remarks.

1. The standard approach to economics is epitomized by the axiom of scarcity. Society manages limited resources to satisfy unlimited wants and needs. Key scarce resources are represented by time, materials and money; more generally,

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environmental scarcity and climate change have acquired crucial priority.¹ Every economic decision and process imply making a choice and accepting trade-offs.

The core principles of scarcity can be summarized as follows: limited resources and finite inputs; unlimited wants, since human desires for goods and services grow constantly; opportunity costs, since choosing one option necessarily implies giving up the next best alternative.

These issues have been at the heart of constant debates, with the predominance of leading economists leaning towards scarcity. The father of scarcity economics is considered Lord Lionel Robbins, who in 1932 published a fundamental book, “An Essay on the Nature and Significance of Economic Science” (MacMillan and Co., Limited, London).

However, the prevailing scarcity view has been challenged by many important economists and social scientists. First and foremost is John Maynard Keynes, who in 1930 wrote a famous essay, “Economic Possibility for our Grandchildren” (MacMillan, London), where he contended that over time there would be a shift from scarcity to leisure and to capital abundance.

Little known is that Karl Marx himself argued that scarcity is not a permanent societal law, but a product of capitalism itself. According to Marxian thought all economic resources would ultimately be at the disposal of society.²

2. These concepts can be viewed as a key component of the novel emerging economic theory of Universal High Income (UHI). In this theoretical framework Advanced Artificial Intelligence (AAI) and robotics create overabundance.

The primary goal shifts from coping with basic income requirements to sharing widespread societal wealth and high standards of living for every person. The system

¹ For an anticipatory analytical framework see BAFFI, “Discorso introduttivo”, Archivio Storico delle Economiste e degli Economisti (ASEE), Banca d’Italia, Rome, 1984.

² See LEFEVRE, “The sociology of Marx”, Columbia University Press, US, 1982.

relies on massive productivity and production gains from AI and robots, which replace human labour.

The century-established economic theory of scarcity is being replaced by superabundance. The long run is depicted by a world of UHI, where advanced AI and Robotics help create massive material abundance. Dystopia and Utopia meet and create a new metaverse. The author has expounded his views that plenitude can become the standard well before the end of the current century,³ if two provisions are met: (i) the absence of major world shocks - such as sudden, high impact events that alter global societies, economies and politics - and (ii) the enactment of effective measures to cope with climate and energy constraints to bridge the current disconnect between scientific and policy agendas.⁴

Opposite and changing views abound and clash. Two notable examples are worth recalling. Sam Altman – currently the head of Open AI – recently changed his views on the most interesting promise of AI: less work for humans. Productivity and free time would not grow in parallel, as previously argued, because people and enterprises would use AI to produce more: the short working week would be a Chimera. People would work because they have more ambitions. Altman is on record for his previous contentions that industrial policy for the Intelligence Age would be spread in a working week of 32 hours and 4 working days.

A second example of a U Turn change of perspective is offered by Bill Gates who, through his Foundation (Gates Foundation <https://www.gatesfoundation.org>) on August 26 2026 went as far as invoking a global agency to keep under control AI, and

³ See MASERA, “The Age of AI, Robotics and Productivity”, Forthcoming in PAGANETTO, Ed., “Sustainable Global Growth”, G20 Group, Eurilink University Press, Rome, 2026. See also MASERA, “At the crossroads for the world”, Forthcoming in LEYR, 2026.

⁴ See EARTH, “Fossil Fuels and Climate Change: The Facts”, London, UK, February, 2022; CAPRIGLIONE, “Clima, energia, finanza. Una difficile convergenza”, UTET, Torino, 2023; CLÒ - MASERA, “Riflessioni critiche sulle policies climatiche e energetiche con particolare riferimento all’Europa”, in PAGANETTO, Ed., “L’Europa a una svolta”, Eurilink University Press, 2024; GUTERRES, “The Era of Global Boiling”, United Nations, New York, 2023.

an accompanying pact with China: “the top priority of the world”.⁵

3. The term Information and Communications Technology (ICT) was introduced in the 1970s, as an umbrella concept to cover the fields of computing and telecommunications in research and operations. The core technologies had been gradually introduced much earlier and covered computers, radios, telecommunications. The timeframe goes back to the 18th century, with the telegraph, the telephone and mechanical computation.⁶

The iconic origins of AI are anchored to a selective group of geniuses of computable numbers who pioneered new fields in early computing between 1945 and 1955. Reference should be made to von Neumann, Shannon, Turing, Mc Carthy.⁷

What is often disregarded/neglected is that AI is not immune to statistical biases. More precisely, to the intertwining of objective measures and subjective targets, i.e. to what has become commonly referred to as the Goodhart Law. Charles Goodhart is a well-known theorist of monetary policy who worked primarily at the Bank of England and at the London School of Economics (where I was honoured to conduct common research projects). His Law can be stated as: “Any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes”, or, more simply, “when a measure becomes a target it ceases to be a good measure”.⁸

The Law is applicable to AI, where it manifests as the tendency of models and

⁵ GATES, “The Top Priority of the World”, Facebook, Sept. 1 2026.

⁶ See Guglielmo Marconi, Nobel Prize in Physics in 1909 with Ferdinand Braun, in recognition of their contributions to the development of wireless telegraph, *Nobel Foundation Archives Stockholm*. See also SULEIMAN, “Brief History of the Development of ICT”, EDUDIA, 2025.

⁷⁷ See VON NEUMANN, “*Edvac Report*”, US, 1945; SHANNON, “*A Mathematical Theory of Communication*”, Bell System Technical Journal, 1948; TURING, “*Computing Machinery and Intelligence*”, University of Baltimore, 1950; MC CARTHY, “*Can Machines Think?*”, Dartmouth Proposal, 1955.

⁸ See GOODHART, “*Money Information and Uncertainty*”, Bloomsbury, London, 1989.

organizations to game proxy metrics, rather than achieve real-world value, which results in benchmark gaming and objective model misspecifications.

A radical analytical game changer began to emerge, which is epitomized by Niklas Luhmann's pathbreaking system's theory, according to which society should not be regarded as a set of persons and of social relationships, but as a complex dynamic web of communications. Self-regulating systems operate in the web with a high degree of independence: notably politics, law and economics. The "new world" is made more complicated by the interactions with AI, robotics and warfare.

Novel complex vistas open up in what can be described as the "paradox of standards". A fundamental tension has to be reckoned with: value vs openness. A successful technology or product must be widely accepted. Companies open up, by lowering barriers to entry and creating network effects: standards and platforms are widely shared, but a "paradox of openness and of winning open standards" is encountered, which describes the fundamental tension between knowledge sharing and protection in open innovation.⁹

The issues have been identified and explored by the Governor of the Banca d'Italia and Chair of the Board of Directors of the BIS, Basel, Fabio Panetta: "Playing the long game: how should monetary policy adapt to the Great Reconfiguration", Banca d'Italia, Rome, July 2026.

We enter into partially uncharted waters: contrarian views abound and dystopian projections clash, notably in respect of the role, interplay and implications of AI and Robotics.

Many observers fail to identify the twin paired concepts in society, economics and theology: the time profiles of the dynamic changes, as the world goes through the

⁹ The theoretical lens of Prof. Luhmann is of key importance ("The paradox of standards and innovation", ResearchGate: <https://www.researchgate.net>, May 2026). Robots have been designed since ancient times. A notable example was the design in 1495 by Leonardo da Vinci of a mechanical knight encased in a Germanic armour, which could stand, sit, move its arms and head.

stages of Universal Basic Income (UBI), Universal High Income (UHI), abundance and superabundance;¹⁰ The intertwining of human dignity and AI, with attendant challenges and controls.

4. AI and Human Dignity represent a key to unify the considerations expounded, and a fil rouge among the themes of scarcity, abundance, technological advance. Tech abundance does not determine ways and means to distribute benefits. Institutions, governance and ethical principles are decisive in the distribution of benefits, i.e. if superabundance can translate into UHI, with the attendant improvement of human well-being and dignity.

These latter issues have acquired paramount importance in the light of the address of His Holiness Pope Leo XIV to participants in the meeting of the International Catholic Legislators (Clementine Hall, 21 August 2026): “Human Dignity and Artificial Intelligence: Challenges, Chances and Control”.

The Pope invites to reflect upon one of the defining questions of our age. A fundamental dilemma opens up: the progress without precedent of artificial intelligence opens horizons that previous generations had not even imagined. Pope Leo XIV underlines that the technological achievements confront humanity with an inevitable moral question: not merely what humans can do, but what they hope to do.

To quote the Encyclical Letter *Magnifica Humanitas*: “we may be tempted to construct a new Tower of Babel, where power, efficiency and control obscure the face of the human person; or we can build a civilization in which technology serves the integral development of every person. The decisive question remains the same: does technology help people to become more fraternal and responsible toward themselves and toward one another? In this regard the principles of the Church’s Social Doctrine

¹⁰ See MUSK, “AI Robotics will make work optional and money irrelevant”, *Fortune*, <https://fortune.com>.

– the inviolable dignity of every person, the common good, the universal destination of goods, subsidiarity and solidarity – provide the sure criteria for discernment”.

The cogent unescapable conclusion of His Holiness is that artificial intelligence must not diminish humanity; rather, AI needs human intelligence enlightened by wisdom, to become a servant of the common good, not a rival to humanity.

These issues have been taken up and elaborated, from an academic perspective, by Prof. Paolo Garonna, President Fondazione Centesimus Annus pro Pontifice, on the teaching of the Church (Global Interdependence Center, <https://wwwinterdependence.org>). See also Prof. Paolo Savona, “How to manage the growing presence of AI in economic, social and political life”, 2026, Academia.edu, <https://luiss.academia.edu>.

We resume the main thread - and approach the end - of this paper. Around 2075 the global human population, according to demographers from the United Nations (UN Department of Economics and Social Affairs), is expected to peak at 10.3 billion people. Humanoid robot population is projected to surpass 10 billion by the same date, with timelines intersecting, and continued growth of HR: the “More Robots than People Era”.¹¹

Humanoid robotics is therefore the playground of global geopolitical and military competition, as argued by Prof. Dario Velo and General Pasquale Preziosa (Valdai Discussion Club, <https://valdaiclub.com>).

HR represent the instrument to enact the so-called “civil-military fusion”, i.e. the cornerstone of the new military-political strategies and cybersecurity standards. The future of robotics is evidently intertwined with the advancement of AI.

AI can foster economic growth and technological advance, thereby moving away the scarcity constraint and pushing humanity into a period of unprecedented

¹¹ World experts like Elon Musk and global financial institutions, such as Morgan Stanley, project that HR will outnumber persons and reach over 10 billion within the next 15 years. Comprehensive references are contained in: Forbes, “Humanoid Robots are Coming”, 2026, <https://www.forbes.com>.

change. But this can represent a double-edged sword, with significant risks of loss of human control over advanced machines and of unleashing autarkic, self-determining robots (Chaos GPT).¹²

In sum, albeit to different degrees, there is broad convergence among top AI experts¹³ - and notably Geoffrey Hinton 2024 Nobel Prize in Physics for his contributions to AI, Luciano Floridi 2022, Founding Editor, Digital Ethics Center at Yale University, Sam Altman CEO OPEN AI, Dario Amodei CEO Anthropic, Jensen Huang CEO NVIDIA - that rapid AI progress risks outpacing existing safety measures.¹⁴

5. These very synthetic notes are meant to draw focused attention to key undergoing changes of global paradigms. As indicated, from mid-20th century¹⁵ mathematical and symbolic theories unfold towards theoretical superhuman independent intelligence and from scarcity to plenitude.

The aim is: (i) to help focus on different alternatives to cope with the future; (ii) to deal with the possible complex roadmap and timelines; (iii) to reap the still uncovered large potential of AI.

¹² See MASERA, “Megatrend globali, rivoluzione tecnologica digitale, assetti geopolitici”, Passigli Editori, 2024 and BURNHAM, “These are the most urgent AI risks”, MIT Management, Sloan School, July 2026.

¹³ See OZSEVIN, “Top 10 AI Leaders”, AI Magazine, August 2023.

¹⁴ At a closed-door meeting at Capitol Hill, Washington D.C., chaired by Senator Bernie Sanders on September 17 2026, Hinton underlined the risks of machine superintelligence (AI Recursive Self-Improvement – RSI).

¹⁵ The time lapse is generally centered on 1950 and covers the twenty years from 1940 to 1960.

DOES POLITICAL SOVEREIGNTY STILL EXIST? FROM THE STRUCTURAL POWER OF BANKS TO A PUBLIC LAW OF INFRASTRUCTURAL SUBSTITUTABILITY IN THE GEOECONOMIC ORDER

Rosa Coccozza*

ABSTRACT: *This article addresses a question increasingly central to contemporary law and economics: does political sovereignty survive in an economic order where essential social functions are performed by private financial and technological infrastructures? Rather than treat this as a purely conceptual question, the article develops a capability-based theory of sovereignty in which effective public authority is modelled as the state's equilibrium bargaining share in its ongoing relationship with indispensable private infrastructure holders, a share that is shown, through a stylised bargaining model, to be a decreasing function of the cost of substituting that infrastructure. The article traces this dynamic from the structural power acquired by systemically important banks before and after the Global Financial Crisis to the broader and more pervasive dependency generated by Big Tech's control over data, cloud computing, artificial intelligence and digital communication. It argues that political sovereignty has not disappeared but has changed its ontological character: it can no longer be understood as an indivisible possession, but it must be conceived as a capability conditional on jurisdictional authority, enforcement capacity, informational parity, credible outside options and a threshold of democratic accountability. The article's central and most original contribution is normative: it extends the logic of bank*

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recovery and resolution to the digital sphere, proposing the foundations of a public law of infrastructural substitutability, while explicitly confronting the efficiency costs – familiar from the essential-facilities debate in antitrust law – that such a regime would impose on private investment incentives.

SUMMARY: 1. Introduction: the research question and a note on method. - 2. The Sovereignty in Doubt. - 2.1 Sovereignty survives as final legal competence. - 2.2. Financialization and the structural power of banks. - 2.3 From too big to fail to the functional sovereignty of Big Tech. - 3. Synthesis: sovereignty as an equilibrium bargaining share. - 3.1 A stylised bargaining model of infrastructural dependency. - 3.2 Democratic legitimacy as a threshold. - 3.3 From diagnosis to remedy. - 3.4 Restating the synthesis. - 4. Conclusion.

1. The sovereignty of the modern state has traditionally been represented through a vocabulary of finality. The sovereign determines the law, defines the boundaries of legitimate conduct, authorises the use of coercion, levies taxes, issues money and represents the political community in the international order. Markets, firms and financial institutions enjoy extensive autonomy, but they operate within a juridical space whose ultimate source remains public authority.

That representation has become increasingly difficult to reconcile with the institutional morphology of contemporary capitalism. Financial markets condition the cost at which governments refinance their debts; global banks transmit monetary and geopolitical shocks across jurisdictions; private payment and clearing infrastructures mediate the effectiveness of economic sanctions; cloud providers store and process the information on which financial institutions and public administrations depend; and firms controlling advanced artificial intelligence increasingly possess technical capabilities that public authorities cannot reproduce internally.

The analytical problem is therefore not whether the state has vanished, but whether its juridical supremacy continues to correspond to an effective capacity to

govern. This problem is especially visible when the history of financialisation is placed beside the ascent of Big Tech. The Global Financial Crisis revealed that certain banks could not be allowed to fail because their disorderly collapse would have compromised payments, credit and macroeconomic stability — the condition captured, imperfectly, by the expression *too big to fail*. An analogous dependency is now emerging around data, cloud computing, artificial intelligence and communication platforms, with one structural difference: a bank becomes politically decisive principally when it approaches distress, whereas a digital platform may exercise political power precisely while functioning successfully.

The argument proceeds through a dialectical progression, thesis, antithesis, synthesis: the argument developed here weighs a formal-juridical position against an empirical-structural one and resolves the tension through an explicitly normative synthesis. The premises invoked are best read as organising propositions for that synthesis, not as an axiomatic system from which the conclusion is deduced.

Another methodological clarification concerns the historical premise of the inquiry. The argument does not assume that political sovereignty was ever, at some prior historical moment, an absolute and self-executing attribute from which contemporary states have since declined. As demonstrated at length, Westphalian sovereignty has always been a matter of *organised hypocrisy*,¹ a norm frequently invoked and frequently violated, coexisting from the outset with military, fiscal and technological constraints that no state has ever escaped. What is historically specific about the present configuration is not the fact of constraint as such, but its *locus and mechanism*: the constraint increasingly runs through privately owned, non-substitutable infrastructure rather than through the traditional interstate channels of coercion, diplomacy or capital flight. The article's task is therefore to characterise this specific mechanism, not to narrate a fall from a prior condition of perfect sovereignty

¹ KRASNER, (1999), *Sovereignty: Organized Hypocrisy*, Princeton, NJ: Princeton University Press.

that never existed.

Two further conceptual distinctions, though not developed here as an independent taxonomy, are load bearing for the argument that follows and are best made explicit before proceeding. The first is the distinction between *economics* as the allocation of resources under given institutions and *political economy* as the reciprocal constitution of political and economic power.² The choice to frame the state-infrastructure relationship in §2.2 and §2.3 as a power relation, rather than as a market exchange susceptible of purely allocative analysis, rests on this distinction: the structural power exercised by systemically important banks³ and by Big Tech's control over data, cloud computing and artificial intelligence⁴ is not adequately captured by a Robbinsian efficiency calculus, precisely because what is at stake is the *distribution* of authority between public and private actors, not merely the efficient allocation of a given resource among them.

The second distinction concerns the specifically geoeconomic register in which §2 situates the surviving competence of structurally central states. Following the main literature,⁵ *geoeconomics* – the deployment of economic instruments, including finance, trade and technology, in the service of strategic objectives – is here kept

² The distinction is regarded as canonical since Polanyi and restated in systemic terms by Gilpin. See POLANYI (1944), *The Great Transformation: The Political and Economic Origins of Our Time*, New York: Farrar & Rinehart; GILPIN, (1987), *The Political Economy of International Relations*, Princeton, NJ: Princeton University Press; GILPIN (2001), *Global Political Economy: Understanding the International Economic Order*, Princeton, NJ: Princeton University Press.

³ CULPEPPER and REINKE (2014), *Structural Power and Bank Bailouts in the United Kingdom and the United States*, *Politics & Society*, 42(4), 427–454; BRAUN, (2020), *Central Banking and the Infrastructural Power of Finance*, *Socio-Economic Review*, 18(2), 395–418.

⁴ PASQUALE (2023), *Two Visions for Data Governance: Territorial versus Functional Sovereignty*, in CHANDER and SUN (eds.), *Data Sovereignty: From the Digital Silk Road to the Return of the State*, New York: Oxford University Press, 35–48; KELTON, SULLIVAN, ROGERS, BIENVENUE and TROATH (2022), *Virtual Sovereignty? Private Internet Capital, Digital Platforms and Infrastructural Power in the United States*, *International Affairs*, 98(6), 1977–1999.

⁵ LUTTWAK (1990), *From Geopolitics to Geo-Economics: Logic of Conflict, Grammar of Commerce*, *The National Interest*, 20, 17–23; BALDWIN (1985), *Economic Statecraft*, Princeton, NJ: Princeton University Press.

analytically separate from classical *geopolitics*, understood as the spatial and territorial configuration of power. This separation matters because the bargaining model developed in §3.1 formalises sovereignty not as a function of territorial control, but as a function of jurisdictional authority, enforcement capacity, informational parity and the cost of a credible outside option, variables that operate through networks of private infrastructure rather than through the direct occupation or contestation of physical space.⁶ The weaponisation of interdependence discussed in §2, and the substitution-cost logic formalised in §3.1, are accordingly instances of the same geoeconomic mechanism, not of a territorial one.

2. - 2.1. Private economic authority is legally constituted. Banks do not create their own legal personality, determine the enforceability of collateral or confer finality upon payment; platforms do not autonomously establish intellectual property, limited liability or the legal conditions under which personal data may be processed. Those entitlements are produced and maintained by public institutions, and political sovereignty cannot be disproved merely by observing that private actors exercise extensive delegated power.

The post-crisis regulatory record supports this thesis. Governments recapitalised, guaranteed, merged and restructured banks. They increased capital requirements, structured resolution regimes and imposed recovery planning by means of competent authorities. The rescue of the financial system showed that only the public sector possessed a balance sheet and legal authority capable of stabilising the system. The same holds, provisionally, for Big Tech: the EU's Digital Markets Act, Digital Services Act and Digital Operational Resilience Act (DORA) demonstrate that large platforms remain within legal reach, even if, as §2.2 will argue, the *practical* exercise

⁶ FARRELL and NEWMAN (2019), *Weaponized Interdependence: How Global Economic Networks Shape State Coercion*, *International Security*, 44(1), 42–79; FARRELL and NEWMAN (2023), *Underground Empire: How America Weaponized the World Economy*, New York: Henry Holt.

of that reach is increasingly constrained.

Geoeconomics supplies a further reason not to pronounce sovereignty extinct, though the claim requires an important qualification that the original formulation of this argument elided.

Weaponisation of trade, finance, export controls and technology depends on a small number of structurally central states, primarily the United States, capable of compelling or inducing private firms to act in accordance with strategic objectives, often reaching well beyond formal territorial jurisdiction through secondary sanctions and network-based leverage.

Sanctions can be effective because these states control the critical nodes of global infrastructure (banks, payment systems, insurers, clearing institutions and technology suppliers) but their coercive efficacy is empirically variable, tends to decline against great-power targets, and is subject to erosion over time as targeted actors adapt and build alternative infrastructure. Far from demonstrating the disappearance of the state, weaponised interdependence reveals the capacity of a structurally privileged few to project regulatory authority through global private networks, a capacity that is historically contingent rather than a generic attribute of statehood.

The strongest formulation of the thesis is therefore that

sovereignty concerns the final legal competence to determine competences: private entities may administer particular domains, while the state retains the authority to redefine, withdraw or redistribute those functions.

This thesis is correct as far as it goes. It is, however, incomplete, because final legal authority may remain formally public while its exercise becomes economically or technically implausible, the subject of the next two sections.

2.2. The Global Financial Crisis exposed a dilemma of credible commitment.

Governments might announce, *ex ante*, that no institution would be rescued; yet when a systemically important institution approached collapse, rescue could become *ex post* efficient because the social costs of disorderly liquidation exceeded the fiscal and moral-hazard costs of intervention. The promise not to rescue was time-inconsistent, and the market's expectation of public support reflected the *absence of a credible resolution alternative* rather than irrational confidence in political generosity.

This phenomenon has been formalised⁷ as a form of structural power distinct from conventional lobbying. A bank need not persuade the government if its withdrawal or failure would produce consequences policymakers cannot accept, and the magnitude of this power varies systematically with the bank's relevance – that is to significance or systemic role – and domestic exposure, not being automatic or uniform across jurisdictions. On the one hand,⁸ this occurrence shows that the capacity of the financial sector to refrain from collective action during a crisis can itself become a form of power. On the other hand,⁹ it shows that central banks become operationally interdependent with the very market infrastructures they regulate.

This is the first erosion of effective sovereignty properly understood:

the state retains the legal right to impose losses or permit failure, but the social costs of exercising that right render it difficult to use.

The sovereign's formal option persists; its practical outside option disappears. Contemporary evidence on geopolitical risk transmission¹⁰ confirms that this structural

⁷ CULPEPPER and REINKE (2014), *Structural Power and Bank Bailouts in the United Kingdom and the United States*, *Politics & Society*, 42(4), 427–454.

⁸ WOLL (2014), *The Power of Inaction: Bank Bailouts in Comparison*, Ithaca, NY: Cornell University Press.

⁹ BRAUN (2020), *Central Banking and the Infrastructural Power of Finance*, *Socio-Economic Review*, 18(2), 395–418.

¹⁰ NIEPMANN and SHEN (2025), *Geopolitical Risk and Global Banking*, International Finance Discussion Papers No. 1418, Washington, DC: Board of Governors of the Federal Reserve System; BEHN, LANG and REGHEZZA (2025), *120 Years of Insight: Geopolitical Risk and Bank Solvency*, *Economics Letters*, 247, 112168.

position remains active as banks are not merely recipients of geopolitical decisions but channels that redistribute their costs across borrowers, sectors and countries, participating in the implementation, and the propagation of the effects, of foreign policy.

2.3. Big Tech reproduces the logic of structural dependency while changing its object and, critically, its temporal profile. Banks achieve systemic relevance through the organisation of capital, liquidity and payments, and their political leverage is concentrated at the point of distress. Big Tech derives power from the integration of data, computation, network effects, interface control and infrastructural dependence and this power is produced continuously, in ordinary and successful operation, not principally at the edge of failure. Therefore, platforms can exercise three distinct forms of power:

- *Epistemic power*: platforms observe behaviour in real time, while regulators depend on delayed or self-reported disclosures thus giving rise to an asymmetry documented across the platform-governance literature;¹¹
- *Normative power*: platforms formulate and enforce terms of service that function as quasi-public rules for participation in spaces central to political communication;
- *Infrastructural power*: cloud computing, operating systems, identity and AI models are upstream inputs into innumerable public and private activities, with switching costs determined less by market share than by position within a stack of mutually dependent technologies.¹²

It is not just a question of being *too informed to be taken down*, because

¹¹ KLONICK (2018), *The New Governors: The People, Rules, and Processes Governing Online Speech*, Harvard Law Review, 131, 1598–1670.

¹² PASQUALE (2023), cit.; KELTON et al. (2022), cit.

information alone does not immunise a firm against dissolution. What renders intervention difficult is the *co-location* of informational superiority, technical capability and non-substitutable infrastructure within a single organisation. The more precise formulation is that Big Tech may become *too informed for symmetrical regulation* (an epistemic asymmetry with the regulator), *too infrastructural for disorderly failure* (an operational-continuity constraint on public bodies, hospitals, banks and utilities that depend on its services), and *too embedded for rapid dismantling* (a migration-cost constraint borne jointly by users, counterparties and the incumbent itself). Official analysis of cloud concentration in finance corroborates the empirical relevance of exactly this threefold structure.¹³

The antithesis, properly stated, is therefore the following:

political sovereignty is being substantively narrowed because the state increasingly depends on private financial and technological infrastructures that it cannot credibly abandon, fully understand, or rapidly replace.

This does not abolish public law; it shrinks the range of choices public law can effectively implement, a proposition the next section renders analytically precise.

3. - 3.1. The preceding sections show, narratively, that dependency on indispensable infrastructure attenuates public authority. This subsection makes the mechanism explicit, replacing the purely descriptive index of the original draft with a model that generates testable comparative statics.

Consider a bilateral relationship between a public authority *S* and a private

¹³ FINANCIAL STABILITY BOARD (2019), *Third-Party Dependencies in Cloud Services: Considerations on Financial Stability Implications*, Basel: FSB; FINANCIAL STABILITY BOARD (2023), *Enhancing Third-Party Risk Management and Oversight: A Toolkit for Financial Institutions and Financial Authorities*, Basel: FSB; BANK FOR INTERNATIONAL SETTLEMENTS (2019), *Big Tech in Finance: Opportunities and Risks*, Annual Economic Report 2019, Chapter III, Basel: BIS.

infrastructure holder F over the terms x of continued regulation, access or operation (for example, the stringency of a capital requirement, a data-portability mandate, or an operating licence condition). Let $\pi_S(x)$ and $\pi_F(x)$ denote respectively the payoffs each party obtains under agreement on x . Let d_F denote F 's payoff if negotiation breaks down (exit, relocation, non-compliance) and let d_S denote S 's payoff if it exercises its own outside option (prohibition, forced substitution, resolution), where c is the cost of building or accessing a credible substitute for F 's function. Under the generalised Nash bargaining solution¹⁴, the negotiated outcome x^* maximises

$$[\pi_S(x) - d_S(c)]^\alpha [\pi_F(x) - d_F]^{1-\alpha}$$

where $\alpha \in (0,1)$ is S 's relative bargaining weight, itself increasing in jurisdictional authority (J) and enforcement capacity (E), the two variables emphasised in the thesis of §2. The model translates into formal terms an intuition central to the argument: the state's bargaining power depends not merely on what the law entitles it to do, but on what it would cost to do it. Where the cost of substituting the infrastructure is prohibitively high, formal sovereignty remains intact in law, yet the balance of negotiation tilts, in practice, decisively toward the private infrastructure holder.

Two comparative statics follow directly and give the model its empirical bite.

First, S 's equilibrium share of the bargaining surplus is decreasing in c : as the cost of substituting F 's infrastructure rises, $d_S(c)$ falls, the threat of exercising the public outside option becomes less costly to F and less credible as a bargaining instrument for S , and the negotiated terms x^* converge toward F 's preferred outcome regardless of S 's formal legal authority.

Second, S 's realised share is increasing in informational capacity (I); since $\pi_F(x)$

¹⁴ NASH (1950), *The Bargaining Problem*, *Econometrica*, 18(2), 155–162; BINMORE, RUBINSTEIN and WOLINSKY (1986), *The Nash Bargaining Solution in Economic Modelling*, *RAND Journal of Economics*, 17(2), 176–188.

is privately known to F , a public authority that cannot verify F 's true payoff function concedes an information rent additional to the bargaining loss generated by c alone, a standard result in bargaining under asymmetric information.¹⁵

This yields the article's central operational claim:

effective sovereignty over a given domain is the state's equilibrium bargaining share, and it falls monotonically as the cost of infrastructural substitution rises and as the state's informational parity with the regulated infrastructure holder falls.

Unlike the additive index proposed in earlier drafts, this formulation is falsifiable in principle: proxies for c (market concentration, switching costs, single-vendor dependency ratios such as those tracked by the Financial Stability Board for cloud providers) should predict measurable regulatory leniency or delay, an empirical prediction consistent with, though not yet directly tested by, the structural-power literature.¹⁶

3.2. The variables in jurisdictional authority J , the enforcement capacity E , the informational capacity I and is the cost of building or accessing a credible substitute for F 's function (equivalently, the availability of an outside option, denoted O in what follows) are all measurements of the state's *ability to act*. Democratic accountability (D) is analytically heterogeneous with respect to these four and should not be folded into the same continuous bargaining-weight function. An authoritarian state can score highly on J , E , I and O – the domestic financial and digital infrastructure controlled by the Chinese state is, on these four dimensions, arguably *more* consolidated than that of most liberal democracies – without satisfying any meaningful accountability

¹⁵ For the underlying logic see MYERSON and SATTERTHWAITE (1983), *Efficient Mechanisms for Bilateral Trading*, Journal of Economic Theory, 29(2), 265–281.

¹⁶ CULPEPPER and REINKE (2014), cit.; DAFE, HAGER, NAQVI and WANSLEBEN (2022), *The Structural Power of Finance Meets Financialization*, Politics & Society, 50(4), 523–542.

criterion. The correct formalisation therefore treats D as a *threshold constraint* rather than as a fifth continuous argument of the bargaining function: sovereignty is *effective in the normatively relevant sense* only where the bargaining share described in §3.1 is realised by an authority whose exercise of J, E, I and O is itself subject to democratic accountability ($D \geq D_{min}$). Should this threshold not meet, high operational capacity describes effective *state* power, but not effective *sovereignty* in the sense relevant to a constitutional or law-and-economics analysis concerned with legitimacy as well as capacity.

3.3. The bargaining model of §3.1 identifies the substitution cost c as the single variable most directly amenable to legal intervention: J and E are matters of constitutional and administrative design with long adjustment lags, and I requires sustained investment in regulatory technical capacity, but c can in principle be reduced by ex-ante legal design, in the same way that bank resolution frameworks were built, after 2008, precisely to reconstruct a credible public outside option where none had existed.

The article's central normative proposal is accordingly a *digital recovery and resolution regime*, modelled on, though not mechanically transplanted from, post-crisis bank resolution: ex-ante identification of critical digital functions; mandatory operational and legal separability; guaranteed data portability and interoperability; secure access to technical documentation; code, key and configuration escrow for functions determined to be systemically critical; and credible exit and migration plans ensuring continuity during insolvency, geopolitical conflict, cyber disruption or antitrust restructuring. The objective is not to preserve the incumbent firm, but to reduce c , the cost of the public outside option, thereby restoring the credibility of the bargaining position identified in §3.1, without requiring digital autarky: diversification, interoperability and redundancy reduce c without requiring the reduction of c to zero.

This proposal, however, is not costless, and a law-and-economics treatment must confront the costs explicitly rather than treat the regime as a free improvement in public welfare. The essential-facilities debate in antitrust law is directly on point. Mandatory-access remedies of the kind implied by separability and interoperability obligations risk deterring the very infrastructural investment they seek to govern, by reducing the appropriability of returns to firms that build critical infrastructure in the first place.¹⁷ As a matter of fact, a rule requiring any systemically significant provider to guarantee migration, escrow and interoperability ex-ante would, applied indiscriminately, raise the cost of capital for infrastructural investment generally, a cost that would ultimately be borne by the same public and private users the regime aims to protect. The efficiency case for the regime proposed here therefore rests on two calibrating conditions that the essential-facilities literature suggests are necessary, though not sufficient, safeguards: first, that the obligation applies only to functions meeting an explicit, ex ante systemic-criticality threshold (analogous to the designation criteria used for global systemically important banks and, more recently, DORA's critical ICT third-party providers) rather than to the digital sector generally; and second, that separability and escrow obligations are compensated, through regulated access pricing or investment allowances, rather than imposed as an uncompensated taking of firm-specific quasi-rents. Absent these two conditions, the proposed regime risks reproducing, in the digital sphere, the overbroad compulsory-licensing outcomes that the case law following what are regarded as leading cases in the United States and the European Union¹⁸ has, for related reasons, sought

¹⁷ AREEDA (1989), *Essential Facilities: An Epithet in Need of Limiting Principles*, Antitrust Law Journal, 58, 841–853.

¹⁸ See *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004), where the U.S. Supreme Court held that the Telecommunications Act of 1996 had not modified the framework of the Sherman Act, preserving claims that satisfy established antitrust standards without creating new claims beyond those standards. See also *Oscar Bronner GmbH & Co KG v Mediaprint*, Case C-7/97, ECJ, 26 November 1998, concerning access to Mediaprint's nationwide newspaper home-

increasingly to cabin. A full welfare comparison – the efficiency gain from a credible public outside option against the investment-deterrence cost of the obligations that create it – is left for future formal work; the qualitative point that must be conceded here is that the regime, properly designed, is not a Pareto improvement but a redistribution of systemic-risk-bearing from the public to infrastructure providers, justified by an externality (the erosion of the public outside option) that the essential-facilities literature helps to identify but does not, by itself, resolve.

3.4. Sovereignty should not be treated as a binary variable, present or absent. It is better represented as the state's equilibrium bargaining share over the terms on which it depends on indispensable private infrastructure, a share that rises with jurisdictional authority, enforcement capacity and informational parity, falls with the cost of infrastructural substitution, and is normatively qualified, rather than continuously weighted, by a threshold of democratic accountability. Political sovereignty therefore survives neither as an immutable Westphalian relic nor as a ceremonial legal fiction, and it never took the form of unconstrained command that a naïve reading of Westphalian doctrine sometimes attributes to it. It survives, to the extent that it does, where legal design keeps the cost of the public outside option low enough that the state's bargaining share remains compatible with the accountability threshold that gives its exercise democratic legitimacy.

4. The bargaining-theoretic reconstruction offered here converges, on substantive grounds, with the diagnosis advanced within the Continental tradition of “diritto dell'economia”,¹⁹ though it departs from that tradition's characteristically

delivery system, a frequently cited decision on refusal to deal and the essential-facilities doctrine in EU competition law.

¹⁹ CAPRIGLIONE (2025), *Il declino delle democrazie liberali. Diritto, Economia, Geopolitica*, Torino: Utet Giuridica.

doctrinal and regulatory-design methodology by treating power as a continuous, formally modelled strategic variable rather than a matter of constitutional categories alone.

The inquiry began with the question: does political sovereignty still exist? The answer, refined through the bargaining-theoretic synthesis of §3, is neither an unqualified affirmation nor an unqualified negation, and it does not depend on any prior condition of absolute sovereignty having existed and since eroded, no such condition need be assumed, and the historical record suggests none did.²⁰

What the history of banking and the ascent of Big Tech jointly reveal is the same underlying mechanism operating through different variables: financial dependency narrows the state's outside option principally at the point of distress; digital dependency narrows it continuously, through the ordinary and successful operation of infrastructure that becomes, precisely because it succeeds, harder to replace. In both cases, the state's formal authority to regulate, prohibit or resolve is undiminished; what changes is the cost of exercising that authority, and hence the state's realised bargaining share over the terms of its own dependency.

The normative implication is correspondingly precise. The future of effective sovereignty will not be secured by proclaiming national autonomy, still less by pursuing technological autarky, a strategy that the model of §3.3 shows to be self-defeating, since it raises c for the state's own economy without necessarily lowering the specific the cost of substituting that matters, namely the *cost of substituting any single indispensable provider*. It depends instead on the deliberate, and explicitly costed, reconstruction of credible public outside options: in finance, through recovery and resolution regimes whose post-2008 record offers a template; in the digital sphere, through a calibrated, compensated regime of interoperability, portability, escrow and continuity obligations targeted at functions meeting an explicit systemic-criticality

²⁰ KRASNER (1999), cit.

threshold, not at the digital economy at large.

Political sovereignty survives only where dependence remains governable, and dependence remains governable only where the cost of the public outside option is kept low enough, by deliberate legal design, that a democratically accountable authority retains a credible bargaining position vis-à-vis the private infrastructure on which it has come to depend. *Shakespeare's Hotspur* captures, with unusual analytical precision, the distinction between the formal assertion of authority and its effective exercise. The capacity to issue a command is not equivalent to the capacity to secure compliance; nor does the legal attribution of competence necessarily entail the material ability to translate that competence into collective outcomes. Political sovereignty, likewise, cannot be inferred from the formal power to legislate, regulate, prohibit, tax, sanction, or compel. It depends, more fundamentally, on whether public authority retains the institutional capacity to make its commands credible. We can therefore conclude with *Hotspur (Henry IV, Part 1)*:

*“Why, so can I, or so can any man;
But will they come when you do call for them?”*

CLIMATE RISK MANAGEMENT IN THE BANKING INDUSTRY

Andrea Miglionico*

ABSTRACT: *This article addresses the major problems involving climate change and sustainability risk in the banking industry. It provides an overview of the rationales for and types of regulation that banks are subjected to in the context of sustainable finance. It also depicts the climate change movement in the banking sector along with the interplay between banking activities and environmental hazards. Furthermore, this article examines the emerging questions regarding banks' behaviour in causing climate exposures, in particular the impact of sustainability risk on banks and the challenge of implementing disclosure obligations given the voluntary approach of climate-change reporting rules. It explains why the sustainability of financial activities has attracted significant attention on the part of policymakers and regulators on account of the pressing need to address the impact of climate change on banks. The article concludes with some reflections on recent regulatory trends in the banking system which canvasses the key challenges facing bank regulators and supervisors in the UK and the EU about green investment and taxonomy.*

SUMMARY: 1. Introduction. - 2. The challenges of climate litigation. - 3. The debate over sustainable finance and ESG Taxonomy. - 4. A Framework of Taxonomy: The EU Green Bonds. - 5. The Green Taxonomy for Bank Lending. - 6. Conclusive remarks.

1. Accurate estimation of climate exposures lowers the costs of tracking

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pollution emissions and contributes to the mitigation of endogenous financial shocks arising from environmental damages.¹ Although Environmental, Social, and Governance (ESG) criteria are being refined by industry and rating providers, firms are in need of integrating key and accepted parameters into their business strategies.² By modelling well-accepted ESG criteria into corporate climate risk data and management systems, companies can be assisted in re-orienting their internal operational tools. This may even have an impact upon the nature of corporate governance, corporate purpose and business model. Stakeholder engagement can be improved too.³ Corporate decision-making can be informed by forward-looking predictions as to the climate impact on corporate governance.⁴

The absence of adequate methodologies and clear indicators for the assessment of environmental issues as well as the divergences in the international arena on the definition of green investments create information imbalances that limit the effectiveness of monitoring systems.⁵ The broader challenge is standardisation. Data is held in consistent formats, or at least translatable into consistent formats, across all institutions. Standardisation will need to include a variety of granular data: agreement and support by regulators for standardised representations of contracts will support greater efficiencies in many aspects of

¹ Bank of England, 'Enhancing banks' and insurers' approaches to managing climate-related risks – Update to SS3/19' (3 December 2025), Policy statement 25/25, <https://www.bankofengland.co.uk/prudential-regulation/publication/2025/december/enhancing-banks-and-insurers-approaches-to-managing-climate-related-risks-policy-statement>.

²INDERST, KAMINKER and STEWART, 'Defining and measuring green investments: implications for institutional investors' asset allocations' (2012) OECD Working Papers on Finance, Insurance and Private Pensions No. 24, https://www.oecd.org/environment/WP_24_Defining_and_Measuring_Green_Investments.pdf.

³ LUND and POLLMAN, 'The corporate governance machine' (2021) 121(8) *Columbia Law Review* 2563, 2612-2613.

⁴ ZENGHELIS and STERN, 'The importance of looking forward to manage risks: submission to the Task Force on Climate-related Financial Disclosures' (2016) Policy paper, The London School of Economics and Political Science, Grantham Research Institute on Climate Change and the Environment, London. <http://eprints.lse.ac.uk/67133/1/Zenghelis-and-Stern-policy-paper-June-2016.pdf>.

⁵ NIETO and PAPATHANASSIOU, 'Simplifying climate change adaptation for banks in the EU' (2026) ECB Occasional Paper No. 2026/386, <https://ssrn.com/abstract=6625718>.

regulatory reporting and oversight.⁶

A common definition of sustainability and sustainable factors along with the various methodologies to assess the ESG performance is missing in the regulatory framework which cast doubts on the incentive structure of firms. This is the case with ESG ratings which engage in profitable agreements that resemble the business of vendors who are more prone in selling the product rather than in filling the gap of information asymmetries between firms' climate risk management process and investors.⁷

To improve accuracy and clarity in climate-risk reporting, banks should engage with technological applications which can expedite the standardisation of data and the comparability of scores.⁸

Evaluating financial risks associated with climate change involves the application of technological solutions that have the potential to improve the quality of information by translating granular metrics into accurate predictions. The use of technology holds out the promise of improving the assessment of climate risk and the level of climate exposures, and to enhance the transparency of monitoring processes. The main downside is the risk that the application of sophisticated machine learning systems will exacerbate the possibility of technology malfunctioning and failing to achieve its stated purposes.⁹

The potential benefits of technological innovation in climate change should

⁶ ANDERSON, KHAYKIN, PYANET and SCHUERMANN, 'Banks and climate change risk' (2023) in SUNDARAM and HANSEN (eds), *Handbook of Business and Climate Change* (Edward Elgar 2023) ch.4.

⁷ BERG, KÖLBEL and RIGOBON, 'Aggregate Confusion: The Divergence of ESG Ratings' (2022) 26(6) *Review of Finance* 1315.

⁸ GAL and RUBINFELD, 'Data Standardization' (2019) 94(4) *New York University Law Review* 749-750.

⁹ SCHERER, 'Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies' (2016) 29(2) *Harvard Journal of Law & Technology*, 359.

be weighed carefully against the risks.¹⁰ Climate risk disclosures can be expedited through modern technologies, which, in turn, can enhance the transparency of reporting outcomes. As a result, information providers continue to improve quality and availability, although data continues to be one of the largest impediments to climate risk assessment.¹¹

The digitalisation of the corporate sector has been faced with an increasing use of automated processes, e.g., machine learning, neural networks and adaptive algorithms that display intelligent behaviour by taking actions to advance process innovation.¹² Further, the deployment of technology has resulted in the automation of firms' operating systems by supporting both risk assessment and peer comparison. Machine learning software can assist manual intervention, although automated procedures rely on algorithms which, if the software is not perfectly designed, can lead to unexpected outcomes.¹³

Making climate data machine readable entails accurate control for access to and screening of data: artificial intelligence and cognitive computing can enhance real-time information and provide evidence about the climate impact on financial assets.¹⁴ However, the lack of available data on companies' exposure to environmental hazards (e.g., natural disasters, weather disruptions, concentration of greenhouse gases) constitutes a barrier for companies and their investors alike

¹⁰ World Economic Forum, 'Innovation and Adaptation in the Climate Crisis: Technology for the New Normal' (January 2024), Insight Report, https://www3.weforum.org/docs/WEF_Innovation_and_Adaptation_in_the_Climate_Crisis_2024.pdf.

¹¹ MAHER and BURDETT, '6 steps to building climate-resilient value chains through collaboration and tech-enabled adaptation' (10 June 2025) World Economic Forum, <https://www.weforum.org/stories/climate-action/technology-adaptation-climate-resilience/>.

¹² ENRIQUES and ZETZSCHE, 'Corporate Technologies and the Tech Nirvana Fallacy' (2020) 72(1) *Hastings Law Journal* 55.

¹³ CHIU and LIM, 'Technology vs Ideology: How Far will Artificial Intelligence and Distributed Ledger Technology Transform Corporate Governance and Business?' (2021) 18(1) *Berkeley Business Law Journal* 1.

¹⁴ BRUNETTI et al., 'Climate Change and Financial Stability' (2021) FEDS Notes, Board of Governors of the Federal Reserve System, Washington, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3843793.

who find it difficult to evaluate companies' strategies towards climate change issues.¹⁵ A recurrent challenge for banks is to identify a suitable modelling approach for each company's needs in assessing the material factors of climate change relevant to them.

Different models have been proposed by regulators focused on estimating foreseeable transition costs and losses.¹⁶ Although these models still require refinement, such as in relation to data gaps,¹⁷ more sophisticated stress-testing and scenario analysis approaches for corporate climate risk management are emerging. These are crucial issues for prudential regulation as in the medium term climate risk is likely to become a key factor that can undermine financial stability and disrupt the normal functioning of financial systems, with problems already being visible in the availability of insurance for certain geographical areas and sectors.¹⁸

2. One area of climate risk management crucial for banks and other large corporations is climate risk litigation. The increasing attention paid to climate cases filed against corporations has given rise to considerable debate about enforcing "brown activities" (carbon emitting mainly dependent on fossil fuels) and addressing non-sustainable behaviours.¹⁹ Claims of violations of social and human rights are at the centre of climate litigation although the outcomes of disputes have

¹⁵ GROVER and KAHN, 'Firm Adaptation to Climate Change' (2024) NBER Working Paper No 32848, https://www.nber.org/system/files/working_papers/w32848/w32848.pdf.

¹⁶ Basel Committee on Banking Supervision, 'Climate-related financial risks – measurement methodologies' (2021), <https://www.bis.org/bcbs/publ/d518.htm>.

¹⁷ MONNIN, 'Integrating Climate Risks into Credit Risk Assessment - Current Methodologies and the Case of Central Banks Corporate Bond Purchases' (2018) Council on Economic Policies, Discussion Note 2018/4, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3350918.

¹⁸ CLEARY, HARDING, MCDANIELS, SVORONOS and YONG, 'Turning up the heat - climate risk assessment in the insurance sector' (November 2019) FSI Insights on policy implementation No 20, <https://www.bis.org/fsi/publ/insights20.pdf>. See also WOUTER BOTZEN and ROBINSON, 'Climate Risk and Insurance' in DIONNE (ed.), *Handbook of Insurance*, Volume I (Springer 2025) 81-82.

¹⁹ SOLANA, 'Climate Litigation in Financial Markets: A Typology' (2020) 9(1) *Transnational Environmental Law*, 105.

been marginal with respect to the pressure that international movements against climate change and global warming have created with regard to environmental concerns.²⁰ This is also linked to the perception that climate litigation is in its infancy and there is widespread scepticism on the part of the courts about entertaining any arguments sympathetic to the social effects of climate hazards. As Wilensky observed, 'climate change has been treated in the courts much like any other environmental issue and has not resulted in the development of a distinct climate-change jurisprudence'.²¹ However, recent developments with regard to climate protection have shaped successful lawsuits and unexpected judicial activism in the legal proceedings relating to environmental issues.²²

In European countries with a hard constitution and a right of courts to strike down primary legislation, the mantle has been picked up by top courts. The German Federal Constitutional Court declared the Federal Climate Change Act to be partially unconstitutional on the ground that it failed to indicate greenhouse gas (GHG) emission reduction targets, resulting in a breach of the country's binding commitment under the Paris Agreement.²³ A similar conclusion is found in the ruling *The Netherlands vs. Urgenda*, where the Dutch Supreme Court held that a country's inadequate action on climate change may constitute a violation of human rights.²⁴ The judges recognised the legally binding target and the deadline for the Dutch government to reduce GHG emissions, which *de facto* imposes a duty to protect

²⁰ POSNER, 'Climate Change and International Human Rights Litigation: A Critical Appraisal' (2007), Coase-Sandor Institute for Law & Economics Working Paper No. 329, http://ssrn.com/abstract_id=959748.

²¹ WILENSKY, 'Climate Change in the Courts: An Assessment of Non-U.S. Climate Litigation' (2015) 26 *Duke Environmental Law & Policy Forum*, 178.

²² SETZER and HIGHAM, 'Global trends in climate change litigation: 2025 snapshot' (25 June 2025), <https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2025/06/Global-Trends-in-Climate-Change-Litigation-2025-Snapshot.pdf>.

²³ See BVerfG, Beschluss des Ersten Senats vom 24. März 2021 - 1 BvR 2656/18 - Rn. 1-270, <https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/EN/2021/bvg21-031.html>.

²⁴ See ECLI:NL:HR:2019:2007 - Hoge Raad, 20-12-2019 / 19/00135, <https://linkeddata.overheid.nl/front/portal/document-viewer?ext-id=ECLI:NL:HR:2019:2007>.

citizens' rights in face of climate change.

Most interestingly, the Hague District Court set an unprecedented order against *Shell*, ruling that the oil company needs to drastically reduce its carbon emissions and take robust steps towards sustainability.²⁵ This decision formed a precedent for other biggest oil companies that could face similar lawsuits and be required to change their business models.²⁶ Despite the positive attitude of courts in the mentioned cases, climate litigation presents hurdles to find available remedies to prove the responsibility of a company for poor sustainable standards:²⁷ the burden of proof can be challenging if the company is found in breach of disclosure obligations given the voluntary approach of climate-change reporting rules. Similarly, the absence of mandatory fiduciary duties for directors and managers to incorporate non-financial information into the decision-making process may discourage potential claimants.

The moral suasion tool and public nuisance provide modest value to affected stakeholders owing to the 'comply or explain' principles adopted in the climate-change policies which effectively shield corporations from enforcement mechanisms.²⁸

The harmful effects of climate litigation on companies' reputational capital and assets value can stimulate courts to rethink the existing legal arguments on corporate accountability for environmental damages and open up a new judicial framework for successful private lawsuits.²⁹ The current thresholds required to

²⁵ See *Milieudefensie et al. vs. Royal Dutch Shell PLC*. C/09/571932/HA ZA 19-379, <https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBDHA:2021:5339>.

²⁶ RAVAL, 'Dutch court orders Shell to accelerate emissions cuts', *Financial Times* (London, 26 May 2021), <https://www.ft.com/content/340501e2-e0cd-4ea5-b388-9af0d9a74ce2>.

²⁷ For a discussion on tort law remedies in climate change litigation see HUNTER and SALZMAN, 'Negligence in the air: the duty of care in climate change litigation' (2007) 155(6) *University of Pennsylvania Law Review*, 1750-1751.

²⁸ HARPER HO, 'Comply or Explain and the Future of Nonfinancial Reporting' (2017) 21(2) *Lewis & Clark Law Review*, 329-330.

²⁹ YADIN, 'Regulatory Shaming and the Problem of Corporate Climate Obstruction' (2023) 60(2) *Harvard Journal on Legislation* 337.

initiate a climate claim involve burdensome proofs such as the element of causation between the firm's behaviour in causing climate threats and the material injury resulting from the detrimental act.³⁰ This proof appears impractical to achieve because of the lack of the taxonomy in companies' climate exposures.

Climate litigation can foster disclosure duties, which currently seem inadequate given the fragmented regulatory approach of global standards. Effective climate litigation requires coherent climate governance and binding climate regulation: the outcomes of disputes reflect the limited scope of private law actions.³¹

Failure to mitigate sustainability risks would fall into the category of liability in negligence but the absence of legally enforceable disclosure rules can undermine potential claims based on negligent conduct in reporting the financial impact of climate change.³² In this context, climate litigation can be seen as an effective deterrent for those corporations which are reluctant to comply with environmental policies. It can also define a new category of materiality risk to incorporate in the taxonomy rules and, in parallel, can solve the question of causation between climate change and the financial impact on corporate investment decision-making.³³

Considerable attention to ESG claims has been paid in various quarters because of the financial benefits of mitigating climate-change effects, namely sustainable long-term value and higher risk-adjusted returns for shareholders.³⁴ Future return dynamics can also manifest themselves in the form of higher quality

³⁰ GEISS, 'Climate Litigation and Third-Party Litigation Finance' (2025) 100(3) *Indiana Law Journal* 1275.

³¹ BOUWER, 'The Unsexy Future of Climate Change Litigation' (2018) 30(3) *Journal of Environmental Law*, 499-500.

³² PRESTON, 'Mapping Climate Change Litigation' (2018) 92 *Australian Law Journal*, 780-781.

³³ WALLACE, 'Climate change, corporate strategy, and corporate law duties' (2009) 44(3) *Wake Forest Law Review*, 775.

³⁴ BADAWI and PARTNOY, 'Social Good and Litigation Risk' (2022) 12(2) *Harvard Business Law Review*, 323-324.

factors of production such as labour skills, and can be the result of companies' ESG behaviour in the market.³⁵ ESG investments that support social causes can generate better long-term financial returns and can lower the reputational risk of reporting information.³⁶ MacNeil and Esser observe that 'ESG is focused on financial risk and return and therefore integration of ESG factors into the investment process has the primary purpose of improving returns over the long term by mitigating the risks associated with those ESG factors'.³⁷

The landmark decision in *Cowan v Scargill*, where it was held that fund trustees should only invest for the financial profits of their investors without taking account of any social or labour protection goals, is crucial in curtailing the effectiveness of ESG governance.³⁸ Specifically, trustees of a pension fund operated by a coal mining trade union were obliged to focus solely on maximising investment returns, and could not adopt a policy of refusing to invest in forms of energy that competed with coal, even though their aim was to benefit existing scheme members by protecting their jobs. This case poses the question as to whether investment managers are subject to the same limitation as regards refusing to invest in carbon emitting industries (predominantly relying on fossil fuels) in order to slow environmental change and as to whether corporate managers should pursue ethical investments. However, fiduciary duty of trustees is complex, and a more sustainability friendly interpretation is also possible. But still, most trustees believe the duty prevents them from pursuing anything else other than profit unless

³⁵ COHEN, GURUN and NGUYEN, 'The ESG-Innovation Disconnect: Evidence from Green Patenting' (2021) ECGI Finance Working Paper No. 744/2021, <https://ssrn.com/abstract=3718682>.

³⁶ FULTON, KAHN and SHARPLES, 'Sustainable Investing: Establishing Long-Term Value and Performance' (2012), <http://dx.doi.org/10.2139/ssrn.2222740>.

³⁷ MACNEIL and ESSER, 'From a Financial to an Entity Model of ESG' (2021) 23(1) *European Business Organization Law Review*, 11.

³⁸ See *Cowan and Others v Scargill and Others* [1985] Ch. 270.

explicitly instructed so by their beneficiaries.³⁹

To add fuel to the debate, anti-ESG statutes have sparked intense discussion in America, generating scepticism on the regulatory initiatives to foster sustainable investment activities.⁴⁰ As observed, ‘ESG has become a political flashpoint, sparking anti-ESG bills in Congress and legislation in many states that in some cases is directly at odds with measures already in force in others’.⁴¹ The US policy on climate change objectives revealed a more flexible and lenient approach than the EU and the ISSB’s disclosure standards, raising questions on the use of ESG tools for politicization.⁴²

The decision affirmed that the possibility of investment for socially beneficial reasons may result in lower financial benefits to the fund as the trustees’ only concern is to ensure that the return is the maximum possible consistent with security.⁴³

This ruling is emblematic in arguing that the current governance of board structures is not too far from the *Cargill* case: as has been noted, the ‘corporate managers do not, however, have an incentive to address social harms that do not impose financial losses on the company or, more generally, to pursue projects in which the company gains only a small benefit while incurring large costs’.⁴⁴ Despite the pressure to establish more substantive enforcement tools, the attempt of

³⁹ TILBA and REISBERG, ‘Fiduciary Duty under the Microscope: Stewardship and the Spectrum of Pension Fund Engagement’ (2019) 82(3) *Modern Law Review* 456, 459. See also TURNER, ‘Corporate Law, directors’ duties and ESG interventions: Analysing pathways towards positive corporate impacts relating to ESG issues’ (2020) 2020(4) *Journal of Business Law* 245.

⁴⁰ CALEB PIRC, ‘Gambling on Another’s Dime: How ESG Investing Violates the Fiduciary Duty’ (2024) 36(2) *Regent University Law Review* 373. See also POLLMAN, ‘The Making and Meaning of ESG’ (2024) 14(2) *Harvard Business Law Review* 403.

⁴¹ HARPER HO, ‘US ESG Regulation in Transnational Context’ in BINDER, HOPT and KUNTZ (eds), *Corporate Purpose, CSR, and ESG* (Oxford: Oxford University Press 2024) 83.

⁴² HILSON, ‘Climate change and the politicization of ESG in the US’ (2024) 6 *Frontiers in Political Science*, <https://doi.org/10.3389/fpos.2024.1332399>.

⁴³ *Cowan and Others v Scargill and Others* (supra n 36).

⁴⁴ MAHONEY and MAHONEY, ‘The New Separation of Ownership and Control: Institutional Investors and ESG’ (2021), Virginia Law and Economics Research Paper No. 2021-09, <https://ssrn.com/abstract=3809914>.

climate litigation to change corporate behaviour with regard to environmental and social goals appears a titanic endeavour considering the minimal effects of judicial decisions on management duties to disclose climate risks.⁴⁵

3. Sustainable finance and climate change have emerged as an area of renewed interest in the wake of the global financial crisis, when the assessment of banks' risk management was shown to be the key to the prevention of systemic disruption.⁴⁶ While many aspects of bank disclosures were strongly and quickly revised following the crisis, even several years later commentators have noted a continuing pressure for improvement to regulatory requirements in relation to financial statements.⁴⁷ Much of the debate focuses on the need for expedited operational execution of reporting information.⁴⁸ For example, corporations demonstrated scant incentives to engage with regulatory initiatives relating to long-term sustainable investments that require expedited organisational systems and effective measurement of climate data.⁴⁹

Significant advances have taken place over the past decade in digital technologies, especially in the security and processing of granular data, specifically how these new technologies can be deployed in a manner that will address the need to eliminate the vulnerabilities of the climate risks management process, which requires standardisation of data to improve managerial decision-making and

⁴⁵ HÖSLI and WEBER, 'Climate Change Reporting and Due Diligence: Frontiers of Corporate Climate Responsibility' (2022) 18(6) *European Company and Financial Law Review* 948.

⁴⁶ RAMAKRISHNA, *Climate Change Risk Management in Banks. The Next Paradigm* (Berlin: De Gruyter 2024) 42-43.

⁴⁷ LIGHT and SKINNER, 'Banks and Climate Governance' (2021) 121(6) *Columbia Law Review* 1895,

⁴⁸ FERRARINI 'Corporate Purpose and Sustainability' (2020) ECGI Working Paper 559/2020. http://ssrn.com/abstract_id=3753594.

⁴⁹ JOHNSTON, 'Climate-Related Financial Disclosures: What Next for Environmental Sustainability?' (2018) University of Oslo Faculty of Law, Legal Studies Research Paper Series No. 2018-02, p.29. <https://ssrn.com/abstract=3122259>.

desired outcomes.⁵⁰

The objective of addressing the sustainability factors in the companies' business activities with particular emphasis on certain weaknesses in the current regulatory framework as well as the problems associated with the regulatory reporting have become the key challenges for financial firms. Despite the activism of global regulators and national legislatures with regard to the climate-change movement, the various policy interventions have essentially been based on voluntary soft-law rules that revealed a light-touch approach of regulatory requirements. Market-driven strategies have characterised companies' responses to environmental hazards, although the existing assessment processes show limitations when it comes to providing accurate predictions.⁵¹

Further debates in the transition to ESG taxonomy are found at the EU level where several pieces of legislation have adopted a mandatory approach to foster green investments and incorporation of human rights provisions into disclosure obligations (e.g., sustainability risks in the investment decision-making processes).⁵² However, such a regulatory framework does not include enforcement mechanisms which create a sort of protection for companies that are basically shielded from the 'comply or explain' principle of the climate-policy monitoring system.⁵³ Further improvements in enforcing ESG standards ensue from the climate risk litigation, which is gaining much attention on account of its impact on the reputational capital of firms.

Climate litigation is potentially harmful to board structures and poses a

⁵⁰ CULLEN, 'Central Banks and Climate Change: Mission Impossible?' (2023) 9(2) *Journal of Financial Regulation*, 177-178.

⁵¹ CHENET, RYAN-COLLINS and VAN LERVEN, 'Climate-related financial policy in a world of radical uncertainty: Towards a precautionary approach' (2019) UCL Institute for Innovation and Public Purpose, Working Paper Series, <https://www.ucl.ac.uk/bartlett/public-purpose/wp2019-13>.

⁵² LITWIN and SAVOUREY, 'Human Rights in EU Sustainable Finance' (2025) 11(1) *Journal of Financial Regulation* 51-52.

⁵³ ATTENBOROUGH, 'Company law's backgrounded relevance to climate change mitigation' (2025) 25(2) *Journal of Corporate Law Studies* 393.

financial threat for corporate management that can be dragged into significant cost exposures and public scrutiny. It is unlikely that claimants have a good chance of succeeding in their pleading given the onerous proof of causation, which is considered an insurmountable obstacle in climate litigation.⁵⁴ Corporations need to manage climate risk because of their own economic futures, mandatory disclosure compliance and the risk of climate litigation.

4. Green bonds are debt instruments operating as an asset-class financing technique for environmentally friendly projects.⁵⁵ The main goal is to expose investors to a quantitative and measurable environmental impact while, at the same time, finance or refinance assets that mitigate climate change.

As part of the EU Taxonomy, the Green Bond Regulation provides a market-based governance set of ‘gold standards’ which is an opt-in and not a mandatory regime.⁵⁶

Social bonds and gender bonds⁵⁷ sustainability policies have expanded in

⁵⁴ WASIM, ‘Corporate (Non)Disclosure of Climate Change Information’ (2019) 119(5) *Columbia Law Review*, 1319-1320.

⁵⁵ See the United Nations Sustainable Development Goals and Climate Bonds Initiative, <https://www.greenfinanceplatform.org/themes/sustainable-green-and-social-bonds#:~:text=The%20bond%20markets%20offer%20an%20additional%20source%20of,as%20renewable%20energy%2C%0energy%20efficiency%20and%20clean%20water>.

⁵⁶ Regulation (EU) 2023/2631 of the European Parliament and of the Council of 22 November 2023 on European Green Bonds and optional disclosures for bonds marketed as environmentally sustainable and for sustainability-linked bonds. For commentary see PYKA, ‘The EU Green Bond Standard: A Plausible Response to the Deficiencies of the EU Green Bond Market?’ (2023) 24(4) *European Business Organization Law Review* 623.

⁵⁷ Gender bonds are debt securities in the form of social bonds with a focus to finance gender equality. They are a financing technique for firms which follow the Social Bond Principles established by the ICMA and contribute to the UN Sustainable Development Goal 5, and are verified by independent entities, known as second-party opinions. Gender bonds are an innovative instrument in capital markets although there is risk of “pink washing” with bonds being labelled as gender but not having gender equality objectives or not having impact on gender equality. The case of social bonds issued by Iceland to support gender equality projects illustrates a strong position to protect women on low incomes, and a reduction in unpaid work such as caring. See VINCENSINI and NJUKI, ‘What Potential Do Gender Bonds Have For Increasing Financing For Gender Equality? (August 2024), <https://www.globalissues.org/news/2024/08/06/37389>.

recent years to encompass initiatives such as green securities, climate finance, carbon finance, green insurance, green credit, and green infrastructural bonds with a view to reducing carbon emissions and protecting the ecosystem.⁵⁸ Whilst green finance has the potential to result in significant environmental benefits, regulators and policymakers question the gap of transparency, mandatory regulation, and the role of bond investments in funding the corporate transition to carbon neutrality (reporting is necessary to assess how green bonds are linked to issuers' climate targets).⁵⁹

Green bonds are designed to fund investments with a positive impact on the environment and respond to the need to raise capital for low-carbon investments (e.g., renewable energy, electric transport, water management, agrobiodiversity).⁶⁰ They are issued with a premium which is the 'greenium' element of the investment that should provide a cheaper source of financing the sustainable project and fill the gap of information asymmetries between bond issuers and buyers.⁶¹ Some commentators argue that 'green bonds in their economic substance remain an issuer-financing device and should not automatically be interpreted as funding specific activities'.⁶² The "green" preference of investors is a function of the green

⁵⁸ INDERST, KAMINKER and STEWART, 'Defining and Measuring Green Investments: Implications for Institutional Investors' Asset Allocations' (2012) OECD Working Papers on Finance, Insurance and Private Pensions, <https://doi.org/10.1787/5k9312twnn44-en>.

⁵⁹ TUHKANEN and VULTURIUS, 'Are green bonds funding the transition? Investigating the link between companies' climate targets and green debt financing' (2022) 12(4) *Journal of Sustainable Finance & Investment*, 1198.

⁶⁰ Governments are particularly active in issuing sovereign green bonds which support sustainable goals along with 'the establishment of benchmarks for the framework, allocation, and impact reports, as well as raising awareness of sustainability issues'. OECD, 'Global Debt Report 2024': Bond Markets in a High-Debt Environment', p.133, <https://doi.org/10.1787/91844ea2-en>.

⁶¹ DEMSKI, DONG, MCGUIRE and MOJON, 'Growth of the green bond market and greenhouse gas emissions' (March 2025) *BIS Quarterly Review*, https://www.bis.org/publ/qtrpdf/r_qt2503d.pdf. See also 'Green bonds: the disappearing greenium is a welcome development' *Financial Times* (London 2 January 2023), <https://www.ft.com/content/915d12e7-1ff4-48c3-87c2-76b2904d03ce>.

⁶² STEUER and TRÖGER, 'The Role of Disclosure in Green Finance' (2022) 8(1) *Journal of Financial Regulation*, 15.

bond premium and signal of the sustainable credentials of green firms.⁶³ The optimal strategy of firms and investors results from the combination of green bond pricing, greenwashing and carbon pricing.

However, the lack of clear commitments to sustainability, poor enforceability of green promises, and limited climate transition to a green economy poses challenges about opaque practices in the issuance procedures.⁶⁴ The use of bond financing mostly reveals fossil fuel-related activities and not the development of lower carbon alternatives.⁶⁵ The ICMA Green Bond Principles established a set of voluntary guidelines that recommend transparency and disclosure as well as promote integrity in the development of the green bond market, in particular to the approach for issuing a green bond.⁶⁶

The successful growth of the green bond market largely depends on the creation of demand and supply along with liquidity which align with a sustainable culture and environmental actions of firms. In China, for example, green bond markets are generally characterised by a robust participation of the central government that coordinates convergence with international standards and acts as a major issuer.⁶⁷ The voluntary nature of disclosure requirements and limited information available to market players raise concerns about the legitimacy and

⁶³ GAO and SCHMITTMANN, 'Green Bond Pricing and Greenwashing under Asymmetric Information' (December 2022) IMF WP/22/246, 3-4.

⁶⁴ Green bond issuance presents a few challenges, namely the identification of a "green" element, the verification of third-party to guarantee that the proceeds fund targets an environmental project. Further, green bond issuers may face reputational risk if the green element of the bond or its credentials are opaque (e.g., transparency of the reports to launch a bond issuance procedure). For an overview see DÜRINGER, HERMES and HOMROY, 'Green Bonds as a Tool of Green Financing' in LEHNER, HARRER, SILVOLA, WEBER (eds), *The Routledge Handbook of Green Finance* (Abingdon: Routledge 2023) ch.28.

⁶⁵ SHIBLI, 'European banks channel \$230bn to fossil fuel expansion', *The Banker*, 8 November 2024, <https://www.thebanker.com/European-banks-channel-230bn-to-fossil-fuel-expansion-1731059577>.

⁶⁶ ICMA, 'Green Bond Principles. Voluntary Process Guidelines for Issuing Green Bonds' (June 2025), <https://www.icmagroup.org/assets/documents/Sustainable-finance/2025-updates/Green-Bond-Principles-GBP-June-2025.pdf>.

⁶⁷ LIN and HONG, 'Developing a Green Bonds Market: Lessons from China' (2022) 23(1) *European Business Organization Law Review*, 166-167.

credibility of bond issuers; further, a commonly accepted definition of the ‘green’ element in the issuance is missing in the current regulatory framework.⁶⁸

The EBA noted that the definition of green loans should leverage, as much as possible, current market practices and industry standards that are in line with the EU’s environmental objectives where the determinant element of a green loan is the utilisation of loan proceeds.⁶⁹ Green bonds, sustainable and sustainability bonds⁷⁰ show inadequate green contractual protection for investors, dubious quality of reporting metrics, greenwashing appetite, and higher transaction costs.

The key challenges are how to design a bond which credibly commits the issuer to pursue objectives that are aligned with investors’ values’ and how to enforce legal promises in green bonds.⁷¹ The high discretion of the bond issuer in selecting the sustainable project is the crux of the matter: the bonds may create a free riding effect for companies to benchmark their green credentials.⁷² ESMA observed that green bonds can give a “free lunch” for issuers, for example, because of the widespread use of call options, which means issuers could recall a bond before a step-up takes place, as well as low step-up rates”.⁷³ This raises the question of how the green bonds should be regulated from a prudential perspective which involves the implementation reviews of the voluntary standard coherent with the EU sustainable finance strategy and monitoring concerns (compliance and

⁶⁸ SARTZETAKIS, ‘Green bonds as an instrument to finance low carbon transition’ (2021) 54(3) *Economic Change and Restructuring* 755, 765-766.

⁶⁹ EBA, ‘Opinion of the European Banking Authority on green loans and mortgages’ (December 2023), EBA/Op/2023/13.

⁷⁰ Sustainability bonds are debt securities where the proceeds should be used to finance green and social projects. Sustainable bonds are a debt instrument for financing the ecological and social transition by mobilising public and private investment for projects with a positive impact on the environment and society.

⁷¹ CURTIS, WEIDEMAIER and GULATI, ‘Green Bonds, Empty Promises’ (2023) 102(1) *North Carolina Law Review* 131, 135.

⁷² BRYAN, ‘Sustainability bond market stumbles as investors get picky’, *Financial Times* (14 February 2023), <https://www.ft.com/content/309a703a-3a5f-420e-afea-38a142a2f21a>.

⁷³ ESMA, ‘Report on Trends, Risks and Vulnerabilities’, ESMA50-165-2438, 9 February 2023, p.35-36.

enforcement mechanisms) of the issuances.

The European Supervisory Authorities (ESAs) are very active in steering banks to implement prudential measures towards green finance: ESG-related risks and climate risks have been incorporated into the Supervisory Review and Evaluation Process (SREP), disclosure requirements, and stress testing exercises.⁷⁴ As argued, the EU prudential regulation proved to capture climate-related risks identified as material by supervisory authorities which have the mandate (and responsibility) to review and evaluate such risks.⁷⁵ The prudential framework is composed of three main pillars: capital and liquidity requirements; SREP and stress test scenarios; market discipline and information disclosures.⁷⁶ The prudential treatment of green bonds falls within the sustainable finance plan where banks are required to prudentially supervise asset classifications in relation to the ESG risks.⁷⁷

5. The ongoing pressure for enhanced bank transparency on green measures has gained the attention of regulators and policymakers.⁷⁸ However, the lack of clarity in defining sustainable assets and ESG metrics (e.g., greenhouse gas emissions, diversity percentages, and tax payments) has introduced ambiguity in

⁷⁴ ESAs and ECB, ‘Fit-for-55 climate scenario analysis’ (19 November 2024), ESA 2024 21, https://www.ecb.europa.eu/pub/pdf/other/ecb.report_fit-for-55_stress_test_exercise~7fec18f3a8.it.pdf.

⁷⁵ DE ARRIBA-SELLIER, ‘Turning Gold Into Green: Green Finance In The Mandate of European Financial Supervision’ (2021) 58(4) *Common Market Law Review*, 1136-1137.

⁷⁶ BINDER, ‘Prudential Requirements Framework and Sustainability’ in ALEXANDER, GARGANTINI and SIRI (eds), *Cambridge Handbook of EU Sustainable Finance. Regulation, Supervision and Governance* (Cambridge University Press 2025) 526; GRÜNEWALD, ‘Sustainability and prudential banking regulation’ in PACCES, MARTINO and NABILOU (eds), *Comparative Financial Regulation* (Edward Elgar 2025) ch.19; JOOSEN, ‘Prudential Requirements for ESG Risks of Banks’ in BUSCH, FERRARINI and GRÜNEWALD (eds), *Sustainable Finance in Europe Corporate Governance, Financial Stability and Financial Markets* (Palgrave Macmillan 2024) 291.

⁷⁷ COLAERT, ‘The incorporation of environmental considerations in the regulation and supervision of prudential risks’ in *Treading softly: How central banks are addressing current global challenges*, ECB Legal Conference 2023, p.105.

⁷⁸ PARK and KIM, ‘Transition towards green banking: role of financial regulators and financial institutions’ (2020) 5(5) *Asian Journal of Sustainability and Social Responsibility* 1.

assessing banks' performance regarding social and environmental values. This has resulted in tension and uncertainty surrounding the implementation of positive actions. While there exist numerous commendable practices and initiatives, such as those outlined in the Paris Agreement and EU Taxonomy objectives⁷⁹, the absence of clear guidance for national regulators on compliance requirements raises concerns among market participants.

This is problematic both from a financial stability perspective, as risks remain undetected and unmitigated, and from a market integrity and customer protection perspective, as retail investors cannot meaningfully assess the degree of sustainability of bank operations.

Thus, the need to address the sustainability criteria in banks' business activities as well as the problems associated with qualitative disclosures pose challenges for regulators and policymakers. In order to positively steer or incentivise banks towards lending for green or sustainable purposes, further regulatory reform may be necessary. Banks employ ESG data in their lending decisions, but these may require disclosure by clients and reliable verification by third parties.⁸⁰

Banks' corporate clients may not disclose information, and there is a risk of collusive behaviour between other than banks and raters which derive high revenues that can be gained through providing lenient assessments.⁸¹ Further, a lack of dialogue and consistency among different banks creates uncertainty surrounding the extent of their green commitments. Currently, some piecemeal initiatives have been available, such as the Green Finance Platform where policies

⁷⁹ Financial institutions offering financial products including occupational pensions in the EU must disclose how and to what extent their economic activity includes, promotes or finances sustainable projects according to criteria of the taxonomy.

⁸⁰ LIU, CAO, DONG and WU, 'How do borrower ESG performance and risks matter to banks?' (2025) *The British Accounting Review* 101767, <https://doi.org/10.1016/j.bar.2025.101767>.

⁸¹ DELL'ERBA and DORONZO, 'Sustainability Gatekeepers: ESG Ratings and Data Providers' (2023) 25(2) *University of Pennsylvania Journal of Business Law* 360.

and regulations of different jurisdictions are made publicly available.⁸² However, these initiatives have faced the following problems which disturb their good intentions and make them less practical in terms of wider adoption. First, there is no comparability: the way these data are measured is not transparent and, hence, is difficult to compare among different jurisdictions.

It is also unclear what benchmark is adopted by banks, as the most objective benchmarks are usually measured through global standard settings (e.g., Taskforce on Nature-related Financial Disclosures).⁸³ Secondly, there are no binding effects; they are only for reference purposes. Thirdly, there is no real-time update of their practice. It is unclear whether these policies and regulations are complied with by the banks and their corporate clients.

The roots of these issues, while being obvious, are difficult to resolve without a standardised approach that is commonly understood by policymakers, stakeholders at central banks, and financial market participants. This lack of transparency and voluntary nature of guidelines has allowed bond issuers to prioritise short-term profitability over long-term sustainability and social responsibility.

It is questioned if the UK Green Taxonomy⁸⁴ and EU Taxonomy Regulation⁸⁵ can provide standardisation for banks and regulators in terms of incentivising or steering bank lending towards sustainable activities.

Tackling the impact of climate risk in order to preserve financial stability has

⁸² See <https://www.greenfinanceplatform.org/>. See also CHENG, EHLERS, PACKER and XIAO, ‘Sovereign Green Bonds: A catalyst for sustainable debt market development?’ (2024) IMF Working Papers WP/24/120, <https://www.greenfinanceplatform.org/sites/default/files/downloads/resource/Sovereign%20Green%20Bonds.pdf>.

⁸³ Taskforce on Nature-related Financial Disclosures, ‘Getting started with adoption of the TNFD Recommendations’ (September 2023), https://tnfd.global/wp-content/uploads/2023/09/Getting_started_TNFD_v1.pdf?v=1698156380.

⁸⁴ HM Treasury, ‘UK Green Taxonomy. Consultation’ (November 2024), pp. 7-8, <https://www.gov.uk/government/consultations/uk-green-taxonomy>

⁸⁵ Regulation (EU) 2020/852.

become the main priority in the agenda of global regulators and national supervisory authorities. At the UK level, the project of Green Taxonomy referred to a classification tool which provides its users with a common framework to define which economic activities support climate, environmental or wider sustainability objectives.⁸⁶ The announced objective to facilitate an increase in sustainable investment and reduce practices of greenwashing, while providing a framework for appraising green bonds and supporting investor decision making, was mainly based on the UK's transition net zero economy process and complements the existing international taxonomies with a view to supporting green finance and investment in climate-friendly projects.⁸⁷

However, in July 2025, the Government has officially decided not to proceed with the development of a UK Taxonomy as it would not be the most effective tool to deliver the green transition and should not be part of the sustainable finance framework.⁸⁸

The Treasury argued that there was no compelling evidence that a Green Taxonomy would deliver its intended objectives in a proportionate or effective manner. The Government will focus on alternative policies, such as the UK SRS, transition plan requirements and sector-specific decarbonisation pathways, for channelling capital to green activities and preventing greenwashing.⁸⁹

The UK initiative represents a step forward to build common standards for environmentally sustainable activities: it can create clarity and consistency for investors so that they could easily compare the environmental performance and

⁸⁶ HM Treasury (n 84), p.7.

⁸⁷ HM Treasury, 'UK Green Taxonomy Consultation Response' (July 2025), https://assets.publishing.service.gov.uk/media/687659e6a8d0255f9fe28edd/UK_Taxonomy_consultation_response.pdf.

⁸⁸ Ibid.

⁸⁹ See the editorial of McGOWAN, 'UK Green Taxonomy Dies As Sustainability Regulations Face Global Pushback', *Forbes* (15 July 2025), <https://www.forbes.com/sites/jonmcgowan/2025/07/15/uk-green-taxonomy-dies-as-sustainability-regulations-face-global-pushback/>.

impact of companies and investment funds to inform their financial decisions. It can also improve understanding of companies' environmental impacts through taxonomy-aligned disclosures (for example through the FCA's Sustainability Disclosure Requirements)⁹⁰ and can provide a reference point for companies in terms of clear performance targets. However, the main concerns for taxonomies are market fragmentation, increased transaction costs and an increase in greenwashing through taxonomy arbitrage that may undermine efforts to promote cross-border green capital flows. The UK Green Taxonomy should improve interoperability among other taxonomies to ensure compatibility and consistency with the reporting standards of countries with which the UK shares significant investment flows.⁹¹

6. The objective to address the sustainability factors in the banks' business activities with particular emphasis on certain weaknesses in the current regulatory framework as well as the problems associated with the regulatory reporting has become the key challenges for regulators. Despite the activism of national legislatures with regard to the climate-change movement, the various policy interventions have essentially been based on voluntary soft-law rules that revealed a light-touch approach of regulatory requirements.⁹² In order to positively steer or incentivise banks towards lending for green or sustainable purposes, further regulatory reform may be necessary.

The role of green bonds in the capital markets, its emerging regulatory

⁹⁰ FCA, 'Sustainability Disclosure Requirements (SDR) and investment labels' (November 2023), Policy Statement PS23/16, <https://www.fca.org.uk/publication/policy/ps23-16.pdf>.

⁹¹ Green Technical Advisory Group and Green Finance Institute, 'Promoting the international interoperability of a UK Green Taxonomy' (February 2023), p. 9, <https://www.greenfinanceinstitute.com/wp-content/uploads/2024/06/GFI-GTAG-INTERNATIONAL-INTEROPERABILITY-REPORT.pdf>.

⁹² IONESCU and ELIANTONIO, 'Soft Law Behind the Scenes: Transparency, Participation and the European Union's Soft Law Making Process in the Field of Climate Change' (2023) 14 (Special Issue 2) *European Journal of Risk Regulation* 292-293.

framework and the pressing need to implement a prudential regulatory framework for banks' lending strategies are at the centre of debate among supervisory authorities and policymakers. Despite the promising benefits of these regulatory initiatives, the UK Green Taxonomy and EU Taxonomy Regulation applicable to banks relating to managing sustainability lending (which focus on corporate and investor sustainability laws and reporting requirements) do not provide the necessary reporting infrastructure for dealing with the heightened levels of sustainability duties.⁹³ Further, the regulatory frameworks require accurate information from the bank, but they lack common enforcement practices which are left to national legislation in case of noncompliance with climate disclosure obligations. The lack of transparency in defining sustainable activities aligned with ESG criteria raises concerns for regulators and supervisory authorities in identifying sustainability factors in the banks' business activities. This opacity exposes the industry to the risk of incomplete and inaccurate data, contradicting the objectives of the EU Taxonomy Regulation which requires banks to disclose their environmental financing. Banks rely on rating agencies for expensive data as their clients may not disclose information; validating this data is challenging, let alone conducting due diligence.

⁹³ DE ARRIBA-SELLIER, 'Sustainable Finance: Green Taxonomies as Instruments of System Change?' in VAN ZEBEN and HILSON (eds), *A Research Agenda for Environmental Law* (Cheltenham: Edward Elgar 2025) 164-165.

REAL ESTATE FINANCIALISATION AND NATURE-RELATED RISKS: IS THERE A REGULATORY LOOP FOR CLIMATE-VALUATION-CREDIT LOOP?

Trude Myklebust* - Elisabetta Colombo**

ABSTRACT: *This article examines whether recent developments in European financial regulation are giving rise to an emerging Climate-Valuation-Credit Loop in real estate financialization. Against this background, the analysis considers how climate- and building-related information may become economically and legally actionable, affect real estate valuation and the prudential recognition of collateral, influence mortgage conditions and credit availability, and ultimately determine the capacity of owners to finance renovation and adaptation. The article reconstructs the legal foundations of this mechanism across the CRR, CRD VI, the Mortgage Credit Directive and the recast Energy Performance of Buildings Directive, and relates them to established economic theories of information, valuation, credit rationing and collateral feedback. The Norwegian experience is then considered as a particularly relevant laboratory for the transition from disclosed sustainability to computational sustainability. The analysis suggests that the foundations of the Loop are already embedded in the existing regulatory framework, although its operation remains conditional and institutionally mediated. Accordingly, the emerging challenge concerns the regulatory effectiveness of this interaction and the need to reconcile accurate risk recognition, market efficiency, access to transition finance and the protection of individual positions.*

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SUMMARY: 1. Foreword. - 2. Regulatory Developments in Real Estate Financialisation and Related Risks. - 3. Climate Risk as a Determinant of Creditworthiness. - 4. Economic and Regulatory Foundations of the Climate-Valuation-Credit Loop. - 5. The Norwegian Laboratory: From Climate-Risk Mapping to Computational Sustainability. - 6. Concluding Remarks.

1. Recent regulatory developments reveal a departure from certain approaches of the past, ranging from the pursuit of unrestrained growth to the use of productivity as the measure of all organisations, and point instead towards the hope that the seriousness of the crises recently experienced may induce regulators to reflect more carefully on the concrete forms that financial regulation should take. Several indications suggest that this hope is founded, from sustainability regulation to a renewed dialogue oriented towards peace, even though the world continues to be marked by geopolitical tensions, demographic challenges and potentially very dangerous technological drifts.¹ Against this background, the aim of this study is to examine current forms of regulation in order to understand whether the emerging European regulatory framework establishes the conditions for a regulatory framework whereby climate- and building-related information may impact on the European real estate stock, and whether finance may, in turn, influence the environmental characteristics and future value of the underlying real estate asset.

¹ See, in this broader perspective, DRAGHI, *The Future of European Competitiveness. Part A: A Competitiveness Strategy for Europe*, European Commission, September 2024, pp. 5–7, especially where the Report places the pursuit of growth and productivity within a broader framework encompassing equity, social inclusion, sustainability, freedom and peace, while identifying demographic decline, technological dependence, decarbonisation and geopolitical instability as mutually connected challenges. Draghi notably observes that “Europe’s fundamental values are prosperity, equity, freedom, peace and democracy in a sustainable environment”, and subsequently stresses that “Peace is the first and foremost objective of Europe”. See also LAGARDE, *The choice facing Europeans*, Speech by the President of the European Central Bank at the official dinner of the Deutsche Bundesbank, Berlin, 9 September 2026, emphasising that Europe is entering a “harsher, less forgiving world”, increasingly shaped by geopolitical power, technological dependencies and the need to reconcile economic growth, preservation of the European social model and strategic autonomy.

The present research question emerges from the findings of previous research carried out by us on “Real Estate Financialisation and Nature-Related Risks”, which aimed at reaching a first point of synthesis concerning the relationships among private law, public intervention, real estate and finance, and concluded that the emergence of climate- and nature-related risks in real estate financing raises issues that must also be addressed within the framework of private-law regulation.² Indeed, that research considered real estate as an asset characterised by a dual economic and legal function. On the one hand, real estate represents a fundamental component of individual wealth, household savings and access to housing. On the other hand, the increasing involvement of institutional investors, credit institutions and capital markets has progressively strengthened its role as a financial asset whose value may affect the allocation of capital and the stability of the financial system. Consequently, the financialisation of real estate was considered in connection with the need to reconcile allocative efficiency, financial stability, environmental protection and the safeguarding of individual rights.³

However, the previous stage of this research programme has attempted to identify a specific limitation in the regulatory framework that had developed around

² See MYKLEBUST - COLOMBO, *Real Estate Financialisation and Nature Related Risks*, in *Open Review of Management, Banking and Finance*, 2024, where the authors started their common research by examining the convergence between real estate financialisation, climate- and nature-related risks, financial stability, investor protection and fundamental rights, concluding in favour of an integrated regulatory model combining transparency with substantive obligations. As a methodology remark, nature-related risks are covered under the context of the above-mentioned analysis, while the paper at hand challenges Loop in the climate context, as better detailed hereinafter, implementing a reconstructive law and economics approach.

³ Moreover, the previous research focused on the progressive incorporation of climate- and nature-related risks into financial regulation. In this respect, physical risks, transition risks and litigation risks were considered as factors capable of affecting the value of real estate assets, the exposure of financial intermediaries and the decisions of investors. Accordingly, the analysis identified a progressive extension of the regulatory relevance of environmental risks from environmental law to financial regulation, corporate governance, property law and the law governing lending activities. Hence, the traditional distinction between an environmental externality and a financial risk appeared progressively less capable of explaining the legal consequences arising from climate change and nature degradation.

sustainable finance under the current market and social conditions.⁴ Indeed, the extensive reliance on disclosure reflected the assumption that the availability of adequate information would allow investors and financial intermediaries to incorporate environmental risks into their decisions and allocate capital accordingly. In this respect, that research considered disclosure as a necessary component of an efficient market while questioning its capacity to produce, by itself, the behavioural changes required by the green transition. Accordingly, behavioural limitations, collective-action problems, negative externalities and the long-term character of environmental risks supported the consideration of complementary regulatory instruments, including prudential requirements, substantive standards and mechanisms capable of influencing the allocation of financial resources.⁵ This approach has subsequently found further support in the private-law literature, which increasingly considers information-based regulation as one component of a broader legal response to the barriers affecting climate investment and adaptation.⁶

⁴ See CAPRIGLIONE - ANDENAS - LEMMA, *Demographic Dynamics and Economic Law in the Light of Recent Geopolitical Trends*, in *Law and Economics Yearly Review*, 2025, pp. 1-69.

⁵ See, *inter alia*, KEDWARD - RYAN-COLLINS - CHENET, *Managing Nature-Related Financial Risks: A Precautionary Policy Approach for Central Banks and Financial Supervisors*, 2020; STERN, *The Economics of Climate Change: The Stern Review*, Cambridge University Press, 2007; CARNEY, *Breaking the Tragedy of the Horizon - Climate Change and Financial Stability*, Lloyd's of London, 29 September 2015; DASGUPTA, *The Economics of Biodiversity: The Dasgupta Review*, HM Treasury, 2021. On the relationship between sustainability and the principles of sound and prudent management in financial regulation, see SEPE, *Sviluppo, sostenibilità e sana e prudente gestione in ambito finanziario*, in PASSALACQUA (ed.), *Diritti e mercati nella transizione ecologica e digitale*, Wolters Kluwer - CEDAM, 2022. Moreover, on the question whether the current supervisory framework is capable of absorbing the proliferation of ESG-related obligations placed on credit institutions, and the emerging tensions between algorithmic decision-support tools and the principles of supervisory accountability in the governance of financial intermediaries: LENER - LUCANTONI, *Sostenibilità ESG e attività bancaria*, in *Rivista Bancaria*, 2023; R. Lener, *Vigilanza prudenziale e intelligenza artificiale*, in ROSSANO (ed.), *La supervisione finanziaria dopo due crisi. Quali prospettive*, CEDAM, 2023, pp. 173-180. See also Annunziata, *La gestione collettiva del risparmio e la sfida della sostenibilità*, in Corapi (ed.), *Sostenibilità e mercato finanziario. Questioni aperte e profili comparati*, CEDAM, 2023, for a focused analysis of how sustainability obligations are reshaping the governance of collective investment vehicles.

⁶ See DIBLEY, *Finance*, in KYSAR - LIM (eds.), *The Oxford Handbook of Climate Change and Private Law*, Oxford University Press, 2026, pp. 340-358, considering the limits of regulatory strategies focused on information-based market failures; see also FAURE, *Law and Economics*, *ibid.*, pp. 17-35. For

In a nutshell, the previous research assigned a central position to lenders. Indeed, mortgage lending constitutes one of the channels through which real estate values enter the financial system, since the asset performs an economic function as collateral and its characteristics may affect the conditions under which credit is provided. Therefore, lenders were considered as potential gatekeepers of the ecological transition in the real estate sector, since the pricing, availability and contractual conditions of credit may influence the capacity of real estate owners to purchase efficient buildings or improve the environmental performance of existing ones. Hence, the research concluded that an integrated regulatory framework should connect transparency, prudential regulation, investor protection, financial stability and sustainability while considering the distributive consequences generated by the transformation of real estate markets.⁷

2. Several regulatory developments applicable from 1 January 2025 onwards seems to suggest that this research can now move one step further. Indeed, Regulation (EU) 2024/1623, which amended the Capital Requirements Regulation (CRR) and applies in its main parts from 1 January 2025, introduced a revised prudential approach to the valuation of real estate asset.⁸ In particular, Article 229 CRR requires prudently conservative valuation criteria and establishes specific limits for upward revaluations. Actually, the same provision expressly recognises that modifications capable of

further critical assessment of the European sustainable finance regulatory framework, see BODELLINI, *Environmental sustainability, business and banking: making the case for sensible regulation*, in *Law and Economics Yearly Review*, vol. 12, special issue, part 2, 2023; BODELLINI, *Tra principi generali e standards internazionali di soft law: la disciplina europea sulla finanza sostenibile e l'inizio di una nuova stagione per il "Brussels effect"?*, in *Rivista Trimestrale di Diritto dell'Economia*, 2023, no. 3.

⁷ Such integrated regulatory framework should merge, as applicable, different regulations - mostly developed at European level - on building data, valuation, prudential collateral, creditworthiness, ESG risk management, renovation finance, including CRR III and CRD VI. For foundational reference, please refer to BANI, *Il credito. Contratti e operazioni*, Giappichelli, 2023.

⁸ Reference is made to article 2 of Regulation (EU) 2024/1623 of the European Parliament and of the Council of 31 May 2024 amending Regulation (EU) No 575/2013 as regards requirements for credit risk, credit valuation adjustment risk, operational risk, market risk and the output floor.

unequivocally increasing the real estate value may include improvements in energy performance and improvements in the resilience, protection and adaptation of buildings or housing units to physical risks. In this regulatory context, environmental characteristics have acquired an express relevance within the legal rules governing the prudential value of real estate collateral, and this development provides a particularly significant connection between the environmental condition of a building and the value that may become relevant for prudential purposes.

Furthermore, the European regulatory framework increasingly requires financial institutions to translate environmental information into risk-management processes. Indeed, the EBA Guidelines on the management of ESG risks, applicable from 11 January 2026, require institutions to identify, measure, manage and monitor ESG risks and to integrate them into their ordinary risk-management framework, including credit risk and concentration risk.⁹ Appropriately, the regulatory relevance of environmental information increasingly extends to the internal processes through which financial institutions assess exposures and make decisions. However, the recast Energy Performance of Buildings Directive develops a parallel infrastructure concerning the characteristics and transformation of buildings. Directive (EU) 2024/1275 provides for energy-performance information, renovation passports, national databases and financial instruments supporting renovation, while its concept of mortgage portfolio standards creates a direct connection between the energy performance of mortgaged buildings and the activities of lenders.¹⁰ In this context, the progressive datafication of buildings and the development of climate-sensitive risk management are capable of meeting within the mortgage market.

⁹ EBA, *Final Guidelines on the Management of ESG Risks*, EBA/GL/2025/01, applicable from 11 January 2026 with small and non-complex institutions receiving a further transition period running until 11 July 2026, based on Art. 87a(5) of Directive 2013/36/EU as amended by Directive (EU) 2024/1619.

¹⁰ Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast), particularly Articles 2, 12, 17 and 22 and Annex VIII. On mortgage portfolio standards, see Art. 2(39).

From another perspective, technological innovation adds a further element to this regulatory transformation.¹¹ Automated valuation models, machine-learning techniques and increasingly granular real estate-level data allow physical, environmental, locational and energy-related characteristics to be incorporated into real estate valuation with a degree of speed and granularity that was previously unavailable. It is worth questioning whether the economic relevance of climate-related information increasingly depends on the models through which such information is selected, combined and translated into a valuation output.¹² Furthermore, Regulation (EU) 2024/1689 expressly treats AI systems used to evaluate the creditworthiness of natural persons or establish their credit score as high-risk systems when the relevant conditions are met.

At the same time, it would be useful to verify whether the European Commission's guidance distinguishes systems intended exclusively to evaluate collateral from that specific high-risk use case,¹³ provided that the regulatory distinction between the assessment of the borrower and the assessment of the asset deserves particular attention where the output of a real estate valuation contributes to the determination of loan-to-value ratios, mortgage pricing or other conditions which may affect access to credit.¹⁴ Indeed, this distinction recalls a corresponding

¹¹ As highlighted in LEMMA, *Fintech Regulation: Exploring New Challenges of the Capital Markets Union*, Palgrave Macmillan 2020.

¹² On data governance and algorithmic regulation, see DI PORTO, *Regulating the Digital Economy between Competition Law and Data Governance: Some Reflections*, in *European Competition Law Review*, 2019; DI PORTO, *La regulation dei mercati dei dati*, il Mulino, 2023.

¹³ Regulation (EU) 2024/1689, Annex III, point 5(b). See also European Commission, AI Act Service Desk - Essential Services, guidance concerning AI systems used for creditworthiness assessments and systems intended solely for the evaluation of collateral.

¹⁴ On the legal boundaries and conditions governing the use of automated and algorithmic tools in credit assessment, please refer to GRECO, *Credit Scoring 5.0, tra Artificial Intelligence Act e Testo Unico Bancario*, in *Rivista di Diritto Bancario*, 2021; GRECO, *L'equilibrio delle regole nei mercati dinamici: metodo e prassi della proporzionalità nell'ordinamento bancario*, Cacucci, 2024, who developed a sustained analysis in such regard, examining the interaction between the AI Act, the Capital Requirements framework and the consumer-credit provisions of the Consolidated Law on Banking (*Testo Unico Bancario* - TUB). On consumer protections in mortgage credit, see: ALFANO, *Contratto*

division already present in the Mortgage Credit Directive: Article 18 of Directive 2014/17/EU governs the assessment of the consumer's creditworthiness, while Article 19 requires Member States to ensure reliable standards for the valuation of residential immovable asset. Actually, this verification would lead us to hypothesize that borrower creditworthiness and real estate valuation constitute distinct legal assessments. However, their economic effects may converge within the same mortgage transaction, since the valuation of the real estate asset may influence the prudential recognition of collateral and the economic conditions under which a lender is prepared to provide credit. In fact, the interaction between these legally distinct assessments becomes increasingly relevant when valuation is supported by automated systems and granular climate- and building-related data.

The relevance of the above verification is remarked by recent empirical evidence suggesting that some of these connections are already visible in European mortgage markets. In the July 2026 Bank Lending Survey, euro-area banks reported a climate-related easing of credit standards for buildings with current or targeted good or high energy performance and a tightening for buildings with persistently low energy performance.¹⁵ Moving forward in this direction, energy and climate characteristics are progressively becoming relevant for the supply and demand of mortgage finance, while the availability of credit may simultaneously determine the capacity of real estate owners to finance the improvements required to change those characteristics.

di mutuo e tutela del consumatore nel credito immobiliare: profili di diritto europeo, in *Rassegna di Diritto Civile*, 2020; ALFANO, *La tutela del consumatore nel mercato del credito*, Edizioni Scientifiche Italiane, 2019.

¹⁵ It also represents that banks identified physical risks associated with real estate as the dominant climate-related tightening factor for housing loans, while investment aimed at improving the energy performance of buildings remained the principal factor supporting climate-related mortgage demand; see ECB, *The Euro Area Bank Lending Survey - Second Quarter of 2026*, July 2026, section 5.5. Banks reported net percentages of -20% for the climate-related impact on credit standards concerning buildings with current or targeted good or high energy performance and +14% for buildings with persistently low energy performance.

Accordingly, the relevant research question has evolved in recent times.¹⁶ The first stage of the authors' research investigated whether disclosure could provide an adequate regulatory response to the interaction between real estate financialisation and environmental risk. The present stage considers how environmental information becomes an economically and legally actionable determinant of real estate value and how that value subsequently enters collateral assessment and mortgage-credit decisions. Hence, the regulatory problem increasingly concerns the entire process through which data are transformed into valuation, valuation which may affect financing conditions, and financing conditions influence the future characteristics of the asset itself.

In this respect, the existing literature provides several important elements for the analysis. Indeed, one recent research has extensively examined the impact of physical climate risks on real estate values,¹⁷ and another one has examined the relationship between mandatory real estate-level climate-risk disclosure, housing prices and credit supply, thereby providing evidence that enhanced climate information can affect both valuation and mortgage lending.¹⁸ Previously, it was also addressed green loans and green mortgages as instruments capable of connecting private law, sustainable finance and the transformation of the building stock,¹⁹ and climate risk, real estate valuation, mortgage lending and sustainable renovation

¹⁶ Let us remark that the first stage of this research, as anticipated above, was published in *Open Review of Management, Banking and Finance*, 2024, and that this stage follows the Fifth Italian-Norwegian Conference “The impact of EU regulation on models of banking and finance” held in Rosendal (Norway) on 26-27 May 2026, organized by the Italian-Norwegian Institute of Research for Law and Economics (INRILE).

¹⁷ A systematic map published in 2026 identifies 130 academic and grey-literature studies and confirms a strong concentration of the evidence on physical risks and their capitalisation into real estate values through econometric techniques: see PISEDdu - VANHUYSE, *Existing Evidence on the Impact of Climate Risk on Real Estate Valuations: A Systematic Map*, in *Environmental Evidence*, vol. 15, 2026, art. 8.

¹⁸ CHEN, *Mandatory Climate Risk Disclosure, Housing Prices, and Credit Supply*, in *Review of Accounting Studies*, vol. 31, 2026, pp. 2052-2092.

¹⁹ CASALINI, *Green Loans and Mortgages: Harmonizing Sustainability and Real Estate in the EU*, in *Uniform Law Review*, vol. 30, n. 2, 2025, pp. 250-262.

already constitute established objects of analysis from different disciplinary perspectives. However, EU law has received limited analysis as the legal framework of a single feedback system in which climate- and building-related data may affect real estate valuation, the latter potentially affects prudential collateral and mortgage conditions, and access to credit in turn may affect the owner's capacity to reduce the environmental risk embedded in the asset.

All the above leads us to look for a possible interaction among ESG goals, credit assessment and financing, in order to understand whether there is a regulatory set up that promotes a loop among them (hereinafter defined as 'climate - valuation - credit loop'), and whether this loop produce positive or negative externalities for the benefit of individuals. More specifically, the proposed research considers a sequence in which climate-, environmental- and building-related data contribute to the technical and legal analysis of assets; the resulting valuation becomes relevant for the prudential assessment of collateral; collateral value contributes to the determination of mortgage conditions and credit availability; and access to finance may affect the ability of owners to undertake energy renovation or physical adaptation.

In our research, the proposed hypothesis may develop through different trajectories. A first trajectory can identify a regulatory support to the ecological transition, since investment in energy efficiency or physical resilience may reduce risk, support real estate value, improve collateral quality and facilitate access to further financing. Indeed, the legal recognition contained in Article 229 CRR of improvements in energy performance and physical-risk resilience as modifications capable of increasing real estate value offers an initial regulatory foundation for this positive mechanism.

A second trajectory may detect a self-reinforcing adverse effect, since a climate-related or transition-related discount may reduce the relevant collateral value, contribute to tighter credit conditions and restrict the financial capacity required to

undertake renovation or adaptation.²⁰

Indeed, one of the major legal issues concern the governance of the interaction between individually rational valuation, lending decisions and their aggregate effects. Indeed, the economic approach to climate-sensitive valuation can improve the accuracy of risk measurement, while prudential regulation can strengthen the resilience of lenders. However, the same mechanisms may influence the allocation of credit across buildings, households and geographical areas. Hence, the analysis must consider financial stability, market efficiency and the capacity of borrowers to finance the ecological transition within the same regulatory framework.²¹

All the above calls for a law-and-economics analysis of this emerging regulatory problem, considering that climate risk provides the principal field in which the Loop is examined because the current legal framework, while empirical evidence and valuation methodologies permit the relevant transmission mechanisms to be identified with sufficient precision, provided that nature-related risks remain part of the broader research horizon (and will be considered where comparable channels can

²⁰ These trajectories give rise to a number of related questions that the present research programme intends to address in subsequent phases. One set of questions concerns how climate- and building-related characteristics should enter property valuation and prudential collateral valuation under EU law, and to what extent automated valuation participates in producing the valuation output used in financial decisions. On the evolving mandate of supervisory authorities in the context of sustainable finance, see SICLARI, *Sustainable Finance and the Role of Financial Supervisory Authorities in the European Union*, in *European Business Law Review*, 2022, n. 2. A further set of questions bears on the channels through which climate-sensitive valuation affects collateral values, loan-to-value ratios, mortgage pricing and credit availability. The empirical literature has begun to document statistically significant green pricing premia in mortgage markets - see, *inter alia*, SAUNDERS - STEFFEN - BOGDANOVA, *The Greening of Lending: Evidence from Banks' Pricing of Energy Efficiency before Climate-Related Regulation*, in *Economics Letters*, vol. 229, 2023 - as well as transition-risk effects on bank lending portfolios: BRUNO - BUCHETTI, *Climate Transition Risk and Bank Lending*, in *Journal of Financial Research*, 2023.

²¹ The multi-dimensional character of residential property - as financial asset, store of wealth, source of collateral, and bearer of a fundamental individual and social interest - has generated a substantial body of literature spanning political economy, housing studies, and welfare theory. The foundational framing is provided by AALBERS, *The Financialization of Housing: A Political Economy Approach*, Routledge, 2016 and AALBERS, *The Variegated Financialization of Housing*, in *International Journal of Urban and Regional Research*, vol. 41 n. 4, 2017, pp. 542-554 which demonstrate how mortgaged homeownership has progressively ceased to be merely a welfare and shelter mechanism and become a vehicle for sustaining financial markets.

be identified²²), and the Norwegian experience may provide a particularly relevant field for considering the relationship between sustainable finance, advanced data analysis and long-term investment governance.

3. In addressing the Climate-Valuation-Credit Loop, we will seek to understand the framework of European governance, and the possibility that its regulation was grounded in theories that conceive justice in terms of fairness.²³ What appears necessary to address, then, is the problem of the Loop's operational meaning concerning the way through which it may bring about a distribution that is fair from the perspective of individual rights and efficient from the perspective of the maximisation of social welfare. This perspective may suggest dividing the problem into three parts: how the relevant primary goods are identified, what kind of interpersonal relationship supports their circulation, and, consequently, which rules are capable of producing the greatest benefits for society.

Considering the climate-related factors as the first component of the Loop, they become relevant as the founding elements of the assessment of credit risk. From an economic perspective, this development follows from the ordinary logic of lending.²⁴

²² For the sake of completeness, it appears appropriate to defer to a subsequent phase of this research programme (see above, note 2) any further examination of nature-related risks - a subject already addressed in the mentioned MYKLEBUST-COLOMBO essay in *Open Review of Management, Banking and Finance*, 2024. For the purposes of this part of the research, however, it may be useful to observe that economic analysis has identified specific risks attributable to natural contingencies and that these bear upon creditworthiness assessment; see paragraph 4 - Economic and Regulatory Foundations of the Climate-Valuation-Credit Loop. This, in itself, seems to provide an adequate basis upon which to ground a legal analysis aimed at elucidating how credit supervision rules may yield benefits for the community at large within the markets in which the aforementioned nature-related risks manifest themselves.

²³ See MAFFETTONE, *Utilitarismo e teoria della giustizia*, Bibliopolis, 1982, p. 11 ff.

²⁴ VITA, *Requisiti prudenziali e contenzioso climatico: costo del capitale e responsabilità civile delle agenzie di rating ESG*, in RIGANTI (ed.), *Sostenibilità e mercati vigilati: regolatori e operatori nella "galassia" ESG*, Giappichelli, 2024, addressing the intersection between prudential requirements and the expanding perimeter of climate-related legal liability, with specific focus on two related questions: first, the extent to which ESG rating assessments - and the methodological opacity that characterises them - may affect the cost of capital of supervised entities; and, second, whether and under what

Creditworthiness depends upon the expected capacity of the borrower to generate sufficient resources to service debt, while the price and availability of credit reflect the lender's assessment of the probability and magnitude of future losses. In the classical theory of risky debt, the probability of default therefore constitutes one of the variables determining the value and required return of a credit exposure.²⁵ Climate change becomes relevant within this framework whenever physical or transition risks modify expected income, expenditure, asset values or the volatility of the borrower's financial position.

Hence, climate risk does not constitute a separate category of creditworthiness: it operates as a risk driver capable of affecting the variables through which creditworthiness is conventionally assessed.

This transmission mechanism seems particularly evident in real estate finance. Physical climate risks may generate direct damage to a real estate asset through floods, wildfires, storms, coastal erosion or other extreme events, while chronic phenomena such as rising temperatures, sea-level rise or changes in water availability may progressively affect its usability, maintenance costs and economic attractiveness. Transition risks operate through different channels. Regulatory requirements concerning energy performance, technological change, shifts in consumer preferences and increasing renovation costs can alter the expenses associated with ownership and the expected economic life of inefficient buildings. The recast Energy Performance of Buildings Directive makes this channel increasingly tangible: Directive (EU) 2024/1275 establishes minimum energy performance standards for non-residential buildings and

conditions civil liability may attach to ESG rating agencies whose assessments prove materially inaccurate or misleading. Both questions are directly pertinent to the present analysis: if ESG ratings - which increasingly incorporate climate-risk components - bear upon the prudential position and cost of capital of lenders exposed to real estate assets, then the accuracy of such ratings becomes a structural variable within the Climate-Valuation-Credit Loop, with potential legal consequences that extend well beyond the immediate parties to any lending relationship.

²⁵ MERTON, *On the Pricing of Corporate Debt: The Risk Structure of Interest Rates*, in *Journal of Finance*, vol. 29, 1974, pp. 449-470, esp. pp. 449 ff., developing the structural relationship between the value of risky debt, asset values and the probability of default.

a trajectory requiring substantial reductions in the average primary energy consumption of the residential building stock.²⁶ Accordingly, a building's environmental characteristics can affect a borrower through the cost of adaptation and can simultaneously affect the economic value of the asset supporting the credit transaction.

Economic theory seems to suggest, however, that these two effects must remain analytically distinct. The financial position of the debtor is an element impacting on the probability of default, whereas the value and enforceability of collateral primarily may influence the lender's loss conditional upon default. The distinction between probability of default (*PD*) and loss given default (*LGD*) is therefore essential to understanding the legal architecture of climate-sensitive lending. A flood-prone real estate asset may lose value without impairing the income of an otherwise financially robust borrower; conversely, higher insurance, energy or renovation expenditure may reduce a household's disposable income even where the value of its home remains stable. Climate risk may consequently enter credit-risk models through the borrower, the collateral, or both. The ECB itself describes the prudential transmission mechanism in these terms, observing that physical and transition risks can impact both *PD* and *LGD*, including through lower collateral valuations and adaptation costs.²⁷

This distinction also corresponds to the structure of EU consumer credit law.²⁸

²⁶ Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast), OJ L, 8 May 2024, Art. 9. For non-residential buildings, Member States must establish thresholds addressing the 16 per cent worst-performing segment by 2030 and the 26 per cent segment by 2033; for the residential stock, average primary energy use must fall by at least 16 per cent by 2030 and 20-22 per cent by 2035 compared with 2020.

²⁷ ECB, *Guide on climate-related and environmental risks: Supervisory expectations relating to risk management and disclosure* (November 2020), Table 1 and Expectations 8–9. The Guide expressly identifies effects on *PD* and *LGD* through, inter alia, declining real-estate collateral values and adaptation costs associated with energy-efficiency standards.

²⁸ For further considerations on the private-law dimension of banking relationships, including the duty of creditworthiness assessment and the obligations of financial intermediaries towards retail clients, see

Article 18 of Directive 2014/17/EU requires creditors to conduct a thorough assessment of the consumer's creditworthiness before concluding a mortgage credit agreement and expressly provides that this assessment cannot rely predominantly on the value of the residential real estate asset or on an assumption of future appreciation.²⁹ Article 20 further requires the assessment to be based on necessary, sufficient and proportionate information concerning income, expenditure and other financial and economic circumstances.³⁰ The rule is conceptually important for the Climate-Valuation-Credit Loop. A deterioration in the environmental characteristics of collateral cannot automatically be equated with a deterioration in the debtor's creditworthiness. The law requires the intermediary to preserve an individual assessment of repayment capacity. Hence, even as climate information becomes increasingly relevant to lending decisions, the legal framework continues to distinguish the economic condition of the borrower from the value of the asset securing the exposure.³¹

SARTORI, *I contratti bancari*, in GALGANO (dir.), *Trattato di diritto commerciale e di diritto pubblico delleconomia*, CEDAM, 2016; GALGANO, *La finanza sostenibile e la ricerca di nuovi parametri di adeguatezza*, *Rivista di Diritto Bancario*, 2022. Please refer also to SARTORI - NATOLI - SEMERARO, *Finanza sostenibile, servizi di investimento e tutela dell'investitore*, *Rivista di Diritto Bancario*, 2023, on sustainable finance and the search for new suitability standards - which is particularly relevant to the present analysis - in that it addresses the integration of non-financial objectives into the conduct obligations of intermediaries, a process that raises comparable questions about how climate-related information may alter the allocation of responsibilities between lender and borrower in the context of mortgage credit decisions.

²⁹ Directive 2014/17/EU of the European Parliament and of the Council of 4 February 2014 on credit agreements for consumers relating to residential real estate, OJ L 60, 28 February 2014, Art. 18(1)-(3).

³⁰ *Ibid.*, Art. 20(1).

³¹ On the legal structure of mortgage credit assessment, see Chapters 9 ("Business and Consumer Lending") and 11 ("Regulation of Bank Capital and Liquidity") in KOKKINIS - MIGLIONICO, *Banking Law: Private Transactions and Regulatory Frameworks*, Routledge, 2021. From such analysis, the broader methodological question of how rules-based and principles-based regulatory approaches may be articulated to achieve the goals of financial regulation - a question directly relevant to the design of a regulatory response to the Climate-Valuation-Credit Loop - is depicted in MIGLIONICO - DRIVER, *Rethinking Financial Regulation: An Appraisal of Regulatory Approaches in the UK and EU*, in *Law and Economics Yearly Review*, 2016, vol. 5, n. 1, pp. 98-124. Furthermore, on the legal consequences of informational asymmetries in contractual relationships, in particular pre-contractual information duties in mortgage lending, see DE POLI, *Asimmetrie informative e rapporti contrattuali*, CEDAM, 2002; DE POLI, *Obblighi informativi pre-contrattuali e credito immobiliare: dalla direttiva*

At prudential level, however, climate factors have progressively moved from the periphery of supervisory expectations into the ordinary architecture of credit-risk management. Article 79 CRD requires credit institutions to base credit granting on sound and well-defined criteria, to maintain internal methodologies capable of assessing credit risk at the level of both individual obligors and portfolios, and to operate effective systems for the ongoing monitoring of credit exposures.³² Directive (EU) 2024/1619 - CRD VI - deepens this framework by introducing Article 87a, which requires institutions to have robust strategies, policies, processes and systems for identifying, measuring, managing and monitoring ESG risks over the short, medium and long term.³³ The relevance of this provision lies less in the creation of a distinct category of “green lending” than in the integration of environmental risk drivers into conventional prudential risk management.³⁴ Once climate-related factors have a material bearing on expected repayment or recovery, their consideration becomes part of the ordinary assessment of credit risk.

The EBA Guidelines on loan origination and monitoring had already anticipated this development. They require institutions, when assessing borrowers, to consider exposure to ESG factors and the adequacy of mitigating strategies, including in the

2014/17/UE al piano d'azione per l'Unione dei mercati dei capitali, in *Rivista di Diritto Bancario*, 2022, no. 2.

³² Directive 2013/36/EU, Art. 79(a)-(c), requiring sound and well-defined credit-granting criteria, internal methodologies for assessing individual and portfolio credit risk, and effective ongoing monitoring systems.

³³ Directive (EU) 2024/1619 of the European Parliament and of the Council of 31 May 2024 amending Directive 2013/36/EU, OJ L, 19 June 2024, Art. 1(30), inserting Art. 87a CRD. Article 87a(1) requires robust strategies, policies, processes and systems for identifying, measuring, managing and monitoring ESG risks over the short, medium and long term.

³⁴ For a general framework on the institutional architecture of European financial supervision and the legal conditions under which supervisory mandates may legitimately expand to encompass objectives beyond traditional prudential stability, see PELLEGRINI, *Corso di diritto pubblico dell'economia*, CEDAM, 2023; PELLEGRINI, *L'architettura di vertice dell'ordinamento finanziario europeo: funzioni e limiti della supervisione*, *Rivista Trimestrale di Diritto dell'Economia*, 2012, pp. 52-71.

context of creditworthiness assessments.³⁵ The EBA subsequently clarified that this obligation concerns the manner in which ESG factors may negatively affect the borrower's financial performance. Thus, the relevant prudential inquiry concerns the financial materiality of environmental factors for the borrower rather than a generic assessment of the borrower's environmental impact.³⁶ This clarification is particularly significant because it locates climate considerations within the conventional concept of creditworthiness and thereby limits the possibility of treating environmental classification as a substitute for individual credit-risk analysis. The EBA Guidelines on the management of ESG risks, applicable from 11 January 2026, consolidate this approach by requiring institutions to develop methodologies for identifying and assessing ESG risk drivers and their transmission into established categories of financial risk.³⁷

The economic logic underlying this regulatory evolution can be understood through the theory of asymmetric information. In the Stiglitz–Weiss model, lenders facing imperfect information cannot necessarily compensate for higher perceived risk simply by increasing the interest rate, because higher rates may alter the composition and behaviour of borrowers and thereby increase expected losses.³⁸ Credit markets may therefore respond to uncertainty through quantity restrictions, additional collateral requirements or refusal to lend. Climate information adds a new dimension to this traditional problem. Where lenders possess reliable information capable of

³⁵ EBA, *Guidelines on loan origination and monitoring*, EBA/GL/2020/06, paras. 126 and 146; the Guidelines have applied since 30 June 2021 and integrate prudential credit-risk standards with creditworthiness and consumer-protection requirements.

³⁶ EBA, Single Rulebook Q&A 2022_6606, answer published 21 April 2023. The EBA clarifies that paras. 126 and 146 concern the impact of ESG factors upon the borrower's financial performance and the adequacy of measures adopted to mitigate such detrimental effects

³⁷ EBA, *Guidelines on the management of ESG risks*, EBA/GL/2025/01 issued pursuant to Art. 87a(5) CRD.

³⁸ STIGLITZ - WEISS, *Credit Rationing in Markets with Imperfect Information*, 1981, in *American Economic Review*, vol. 71, no. 3, 1981, pp. 393-410. Their model shows why, under asymmetric information, an increase in the lending rate may adversely affect borrower selection and incentives, so that equilibrium may involve quantity rationing rather than market-clearing interest rates.

distinguishing exposures according to their effective vulnerability, climate risk may be reflected through differentiated pricing. Where information is incomplete, models are uncertain or environmental indicators serve merely as proxies for financial vulnerability, banks may instead respond by reducing exposure to entire geographical areas or categories of asset. Hence, the informational quality with which climate factors are translated into credit-risk parameters determines whether their incorporation produces more accurate pricing or a broader process of credit rationing.³⁹

Information and expectations are particularly relevant because climate risks have a temporal structure that differs from many conventional determinants of creditworthiness. Mortgage lending frequently involves maturities of twenty or thirty years, while physical and transition risks may intensify gradually over comparable horizons. Current borrower income and present real estate asset prices may therefore provide incomplete information concerning the financial condition of the exposure over its entire life. This explains the increasing regulatory emphasis on forward-looking analysis. CRD VI expressly requires ESG risks being considered over short, medium and long horizons, while EBA and ECB supervisory frameworks require institutions to understand how environmental factors can affect counterparties and portfolios

³⁹ Recent empirical evidence confirms that this outcome cannot be assumed: KEMPA, *Physical Climate Risk and the Pricing of Bank Loans*, in *Journal of Environmental Economics and Management* vol. 137, 2026. Using a global sample of almost 86,000 syndicated bank loans, Kempa finds that greater physical climate vulnerability is associated with higher borrowing costs and that the effect is stronger for longer-maturity loans and financially distressed borrowers. Banks also adjust non-price terms such as loan size, collateral requirements and fees, while the evidence on credit ratings supports a transmission channel through long-term default risk. However, Götz, Mager and Zietz reach a materially different result for the Dutch mortgage market; see GÖTZ, MAGER and ZIETZ, *How responsive are mortgage lending conditions to flood risk? The case of the Netherlands in European Financial Management*, vol. 32, issue 2, 2026, pp. 413-437. Analysing more than 100,000 securitised mortgages originated between 2013 and 2023, they find no systematic difference in lending conditions between areas exposed and unexposed to flood risk. Following the 2021 floods, lenders temporarily increased interest premiums and reduced loan-to-value ratios, but the effect subsequently disappeared. The coexistence of these results is important. It suggests that the Climate-Valuation-Credit Loop must be understood as an institutionally mediated mechanism rather than as an automatic relationship between climate exposure and the cost of finance.

through time.⁴⁰ Climate risk consequently introduces an intertemporal component into creditworthiness: the intermediary must assess whether risks that are limited today may become financially material before the exposure matures.

This forward-looking approach nevertheless may create a potential tension between prudential accuracy and model uncertainty. Physical hazards depend upon location, probability, adaptation infrastructure and insurance, while transition risk depends upon future regulatory choices, technological developments and market behaviour. A geographically exposed borrower may therefore remain financially resilient because of adaptation, insurance or income capacity, whereas an apparently low-risk asset may face substantial future transition costs. If lenders employ broad geographical or energy-performance proxies without adequately identifying mitigating circumstances, climate-sensitive credit assessment may generate false positives and induce economically unjustified restrictions in the supply of finance. Conversely, omitting financially material climate information generates false negatives and permits the accumulation of underpriced exposures. The legal problem is therefore one of calibration rather than simple inclusion.

The role of collateral adds a further layer to this mechanism and directly connects creditworthiness to the subsequent stages of the Climate–Valuation–Credit Loop. Kiyotaki and Moore demonstrated that durable assets can perform the dual economic function of productive assets and collateral and that interactions between credit constraints and asset prices can amplify an initial shock.⁴¹ Bernanke, Gertler and Gilchrist similarly showed how changes in borrowers’ balance sheets and external

⁴⁰ See Art. 87a Directive 2013/36/EU, as inserted by Directive (EU) 2024/1619; EBA/GL/2025/01; ECB, *Guide on climate-related and environmental risks* (2020). The EBA framework expressly requires identification, measurement, management and monitoring over short-, medium- and long-term horizons.

⁴¹ KIYOTAKI - MOORE, *Credit Cycles*, in *Journal of Political Economy*, vol. 105, n. 2, 1997, pp. 211-248. Their model identifies the interaction between asset prices and collateral constraints as a mechanism capable of amplifying and propagating shocks through the economy.

finance premia can operate as a financial accelerator.⁴² Applied to climate risk, these theories suggest a possible feedback mechanism. A climate-related decline in real estate values reduces collateral capacity; reduced collateral capacity can restrict credit or increase its cost; tighter financing conditions can depress demand for vulnerable properties and the resources available for adaptation; the resulting market response can further reduce real estate values. What begins as the recognition of a physical or transition risk can consequently become endogenous to credit and asset markets.

CRR III now gives this collateral channel a particularly clear legal expression. Under the amended Article 208 CRR, ESG-related considerations, including constraints deriving from Union and national regulatory objectives and legal acts, are expressly to be regarded as an indication that real estate value may have declined materially relative to general market prices and may therefore trigger a valuation review.⁴³ Moreover, the revised Article 229 provides that improvements in energy performance and improvements to the resilience, protection and adaptation of buildings against physical risks can justify an increase in the prudential real estate value under the conditions laid down by that provision.⁴⁴ These rules are conceptually significant. Environmental characteristics have ceased to be merely contextual information surrounding the collateral: the prudential regime expressly recognises their capacity to affect the regulatory valuation of real estate asset.

However, this development reinforces the need to preserve the distinction between collateral risk and borrower risk. An environmentally vulnerable building may

⁴² BERNANKE, GERTLER and GILCHRIST, *The Financial Accelerator in a Quantitative Business Cycle Framework*, in TAYLOR - WOODFORD (eds), *Handbook of Macroeconomics*, vol. 1C (Elsevier 1999), pp. 1341-1393.

⁴³ Regulation (EU) No 575/2013, Art. 208(3)(b), as amended by Regulation (EU) 2024/1623 (CRR III). The amended provision expressly states that ESG-related considerations, including limitations arising from relevant Union and Member State regulatory objectives and legal acts, would be considered an indication that real estate value might have declined materially relative to general market prices.

⁴⁴ Regulation (EU) No 575/2013, Art. 229(1), as amended by Regulation (EU) 2024/1623. The provision expressly recognises improvements in energy performance and improvements in resilience, protection and adaptation to physical risks as modifications capable, under the conditions specified in the Regulation, of supporting a higher real estate value.

justify a lower prudential valuation or a different LGD assumption without necessarily supporting a higher PD for its owner. Conversely, substantial adaptation expenditure may affect repayment capacity before any reduction in market value occurs. An institution that mechanically transfers changes in collateral valuation into the borrower's creditworthiness would therefore collapse two legally and economically distinct components of credit risk. The architecture of EU law instead supports a more granular transmission mechanism: borrower-specific climate factors enter the assessment of repayment capacity; asset-specific factors enter valuation and credit-risk mitigation; their interaction may subsequently impact lending conditions.

Accordingly, the first stage of the Climate-Valuation-Credit Loop emerges from a convergence between established economic theory and an increasingly explicit body of EU banking law.

Merton's analysis explains why changes in default probabilities affect the price of risky debt; information economics explains why uncertainty may translate into credit rationing rather than linear price adjustments; collateral and financial-accelerator theories explain how asset values can amplify an initial shock through financing constraints. EU law increasingly supplies the institutional mechanism through which those channels can operate: creditworthiness rules require an individual and proportionate assessment of repayment capacity; prudential rules require financially material ESG risks to be incorporated into credit-risk management; and the CRR expressly connects environmental characteristics with the valuation of real estate collateral. Climate risk thus enters the credit relationship through recognisable legal and economic categories. Once translated into PD, LGD, collateral values and lending conditions, it can begin to alter the availability and cost of finance and thereby create the first endogenous movement of the Climate-Valuation-Credit Loop.

4. The regulatory developments that leads to the Climate–Valuation–Credit

Loop considered above can be further understood by identifying the proper mechanisms through which environmental information may affect real estate values, collateral and mortgage credit. Indeed, the regulatory analysis of this loop requires an analytical framework for considering how the legal rules examined in the previous section may interact once climate- and building-related information enters financial decision-making. In this respect, the Climate-Valuation-Credit Loop can refer to certain economic theories and models that explain the most relevant individual relationships within the proposed sequence, and the related regulatory intervention can rely on these theories and models in order to achieve the social goals required by the policy-makers.⁴⁵

To begin with, Akerlof's analysis of markets characterised by quality uncertainty provides a useful explanation of the informational stage of the Loop.⁴⁶ Applied to real estate, this insight becomes relevant where buyers, lenders or investors have incomplete information concerning energy performance, exposure to flooding, physical resilience or expected renovation costs. Climate-related uncertainty clearly extends beyond classical asymmetric information, since some future physical risks remain uncertain for all market participants. Nevertheless, better real estate-level

⁴⁵ Actually, certain theoretical contributions appear particularly useful: Akerlof's analysis of asymmetric information, Rosen's hedonic pricing model, Stiglitz and Weiss's theory of credit rationing, Kiyotaki and Moore's collateral-based credit-cycle model, Bernanke, Gertler and Gilchrist's financial accelerator, and the analysis of the energy-efficiency gap developed by Allcott and Greenstone. The selection is intentionally limited to these contributions, in order to explain the principal stages of the proposed mechanism. Additional references relevant to externalities, efficient information, housing collateral, investment under uncertainty and green innovation include PIGOU, *The Economics of Welfare*, Macmillan, 1920; COASE, *The Problem of Social Cost*, in *Journal of Law and Economics*, vol. 3, 1960, pp. 1-44; GROSSMAN - STIGLITZ, *On the Impossibility of Informationally Efficient Markets*, in *American Economic Review*, vol. 70, n. 3, 1980, pp. 393-408; IACOVIELLO, *House Prices, Borrowing Constraints, and Monetary Policy in the Business Cycle*, in *American Economic Review*, vol. 95, n. 3, 2005, pp. 739-764; DIXIT - PINDYCK, *Investment under Uncertainty*, Princeton University Press, 1994.

⁴⁶ Let us recall that where relevant characteristics of an asset are imperfectly observable, differences in information between market participants may prevent price from adequately reflecting quality and may impair market transactions; see AKERLOF, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, in *Quarterly Journal of Economics*, vol. 84, n. 3, 1970, pp. 488-500.

information can reduce a distinct informational problem concerning characteristics that are already observable or capable of being measured. From a legal perspective, this consideration helps explain the increasing relevance of the information architecture created by Directive (EU) 2024/1275. Energy performance certificates, renovation passports, national databases and the possible connection with digital building logbooks increase the availability and comparability of information concerning the building. In parallel, Regulation (EU) 2023/2854 may facilitate access to data generated by connected products and related services. Accordingly, EPBD and Data Act can be understood as contributing to the first stage of the Loop, since they potentially expand the informational basis from which an economically actionable representation of the asset may subsequently be produced.⁴⁷

Once information becomes available, Rosen's theory of hedonic pricing provides the conceptual bridge between asset characteristics and market value.⁴⁸ Applied to housing, location, size, energy efficiency, environmental quality and exposure to natural hazards may therefore contribute to the price attributed to the asset. This model offers a particularly useful economic interpretation of the revised Article 229 CRR. Indeed, the provision now expressly recognises that modifications improving energy performance or the resilience, protection and adaptation of a building to physical risks may justify an increase in the real estate value recognised under the prudential rules, subject to the conditions established by the Regulation.⁴⁹

⁴⁷ See Directive (EU) 2024/1275, Arts. 12 and 22 and Annex VIII; Regulation (EU) 2023/2854, in particular Arts. 3 ff. Akerlof's framework is used here for the problem of asymmetric information concerning measurable real estate quality and does not eliminate the conceptually different problem of radical or common uncertainty concerning future climate conditions.

⁴⁸ Actually, in a differentiated market, the observed price of an asset can be understood as reflecting the bundle of characteristics incorporated into it, while implicit prices emerge for individual attributes; see ROSEN, *Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition*, in *Journal of Political Economy*, vol. 82, n. 1, 1974, pp. 34-55.

⁴⁹ Regulation (EU) No 575/2013, Art. 229(1), as amended by Regulation (EU) 2024/1623. The provision expressly identifies improvements in energy performance and improvements to resilience, protection and adaptation to physical risks as examples of modifications capable of unequivocally increasing real estate value, subject to the conditions laid down in that Article.

Thus, the law does not prescribe a hedonic model, while it accepts the underlying proposition that environmental and resilience-related characteristics may have economically relevant effects on real estate value. The relationship is especially important for the present research because a characteristic that affects market valuation may subsequently influence the value of the same real estate asset when it performs its legal and economic function as collateral.

A different insight follows from Stiglitz and Weiss's theory of credit rationing.⁵⁰ Indeed, the interest rate itself can impact the composition and behaviour of borrowers and therefore the lender's expected return in the real estate market. Hence, an increase in perceived risk may lead to restrictions in the quantity of credit instead of being translated entirely into a higher price, and then we shall consider this effect even when we regulate the RE financialization. This mechanism is relevant to the Climate-Valuation-Credit Loop because a deterioration in the environmental or energy profile of a real estate asset may affect mortgage conditions through several channels. The lender may adjust pricing, require a different loan-to-value relationship, reduce the amount made available or apply stricter underwriting standards. It is worth considering that the Mortgage Credit Directive provides the legal setting within which these economic responses must be assessed. Article 18 requires a thorough assessment of the consumer's creditworthiness and expressly limits reliance on the current or expected value of the asset, while Article 19 separately regulates real estate valuation.⁵¹ Consequently, climate-sensitive collateral valuation cannot legally replace borrower creditworthiness assessment. Yet the economic conditions of the

⁵⁰ This model demonstrates that credit markets characterised by imperfect information may reach an equilibrium in which some borrowers do not obtain credit even when they would accept a higher interest rate; see STIGLITZ - WEISS, *Credit Rationing in Markets with Imperfect Information*, in *American Economic Review*, vol. 71, n. 3, 1981, pp. 393-410. Their model demonstrates the possibility of equilibrium credit rationing where the interest rate affects adverse selection and borrower incentives.

⁵¹ Directive 2014/17/EU, Arts. 18-19. In particular, Art. 18(3) provides that creditworthiness assessment shall not rely predominantly on the value of the residential real estate exceeding the amount of credit or on an assumption of increasing real estate value, except where the purpose of the credit is construction or renovation.

transaction may still be affected by the real estate asset securing it.⁵²

At the centre of the proposed analytical framework lies the model developed by Kiyotaki and Moore,⁵³ for considering - in the context of RE financialization - the possibility that durable assets perform a dual economic function as both productive for business and collateral for borrowing. The relevance of this mechanism to real estate finance is immediate, as any real estate asset represents owners wealth and simultaneously secures mortgage lending. Hence, a reduction in its economically recognised value can affect the amount or conditions of financing supported by that collateral. Within EU law, this relationship receives particular significance from Articles 124, 125, 208 and 229 CRR, which connect the regulatory treatment of exposures secured by real estate asset with recognised values and prudential valuation requirements.⁵⁴ Article 229 then adds an environmental dimension by expressly addressing energy-performance and physical-resilience improvements. The legal framework therefore allows the classical collateral mechanism to be reformulated in climate-sensitive terms.

On this basis, it is possible to consider that an initial physical or transition risk may contribute to a reduction in the value attributed to an asset both for usage and

⁵² The July 2026 ECB Bank Lending Survey already provides evidence consistent with this differentiation: euro-area banks reported an easing impact on credit standards for buildings with current or targeted good energy performance and a tightening impact for persistently low-performance buildings, while physical risk remained the principal climate-related tightening factor for housing loans; see ECB, *The Euro Area Bank Lending Survey - Second Quarter of 2026*, July 2026, section 5.5. Banks reported a net easing impact of climate-related factors on credit standards for buildings with current or targeted good or high energy performance (-20%) and tightening for persistently low-performance buildings (+14%). Physical risk of real estate remained the dominant climate-related tightening factor for housing-loan standards.

⁵³ Accordingly, asset prices affect borrowing constraints, while borrowing constraints influence economic activity and, through this channel, can subsequently affect asset prices. A temporary shock can therefore produce persistent and amplified consequences through the interaction between collateral values and credit limits; see KIYOTAKI - MOORE, *Credit Cycles*, in *Journal of Political Economy*, vol. 105, n. 2, 1997, pp. 211-248.

⁵⁴ See Regulation (EU) No 575/2013, Arts. 124–125, 208 and 229, as amended by Regulation (EU) 2024/1623. Article 229 regulates the real estate value used for prudential purposes, while the treatment of exposures secured by residential real estate under Arts. 124 and 125 depends on the relevant conditions and recognised real estate value.

collateralization. More restrictive business and financing can subsequently reduce the owner's ability to fund the renovation or adaptation required to improve the asset. In addition, the persistence of inadequate energy performance or physical vulnerability may then maintain, or potentially increase, the original risk and contribute to a subsequent valuation adjustment. Conversely, an investment that improves energy efficiency or physical resilience can reduce risk, support value, strengthen collateral and improve the conditions for subsequent financing. Article 229 CRR is significant precisely because it recognises the possibility that such modifications increase the relevant real estate value, while Article 17 EPBD addresses the financing mechanisms required to make renovation possible.

Hence, the interaction between those provisions can be interpreted through a collateral feedback model in which regulation affects different stages of the same economic sequence.

Moving from the individual mortgage to the financial system, it is worth considering Bernanke, Gertler and Gilchrist's financial-accelerator framework in order to understand whether and how financial frictions can amplify an initial economic shock related to the aforesaid risks.⁵⁵ As this model shows that changes in borrowers' financial position can alter the external finance premium and thereby propagate fluctuations beyond the magnitude of the original disturbance, it is possible to hypothesize that the model can provide the explanation of a possible passage from asset-level climate risk to global financial stability. If climate-related devaluations affect a sufficiently broad or geographically concentrated set of assets, the resulting deterioration in collateral conditions may affect borrowers, mortgage portfolios and banking balance sheets at the same time. In turn, lenders may respond by tightening credit standards, thereby transmitting the original environmental shock into the wider

⁵⁵ BERNANKE - GERTLER - GILCHRIST, *The Financial Accelerator in a Quantitative Business Cycle Framework*, in TAYLOR - WOODFORD (eds.), *Handbook of Macroeconomics*, vol. 1C, Elsevier, 1999, pp. 1341-1393.

economy. CRD VI and the EBA Guidelines on the management of ESG risks are directly relevant at this point because they require institutions to identify, measure, manage and monitor ESG risks through their ordinary risk-management framework.⁵⁶ The prudential relevance of physical and transition risks therefore derives from their capacity to materialise through traditional categories of financial risk. Significantly, the ECB Bank Lending Survey indicates that banks already perceive physical real-estate risk as a tightening factor for mortgage standards, while banks' capital costs associated with climate exposure can contribute to the same direction.⁵⁷

All the above leads to consider that regulation should properly face the problem of the financing of the investment required to change the environmental characteristics of real estate assets (in order to preserve their usage for business and collateralization, and then to prevent a general decrease in quality of several real estate assets). Actually, Allcott and Greenstone's analysis of the energy-efficiency gap can support the regulator in structuring its intervention, as it examines the conditions under which households and firms may fail to undertake energy-efficiency investments that appear privately profitable.⁵⁸ Their contribution is especially valuable because it cautions against assuming the existence of a universal or uniformly large efficiency gap and stresses the importance of identifying the specific market failure before selecting the regulatory response. Among the possible explanations are imperfect information and other investment inefficiencies capable of preventing apparently beneficial measures from being undertaken.

⁵⁶ Directive 2013/36/EU, Art. 87a, as amended by Directive (EU) 2024/1619; EBA, *Guidelines on the Management of ESG Risks*, EBA/GL/2025/01. The Guidelines require institutions to identify, measure, manage and monitor ESG risks and to address risks arising from the transition towards a climate-neutral economy.

⁵⁷ ECB, *The Euro Area Bank Lending Survey – Second Quarter of 2026*, cit. Over the previous twelve months, physical risk of real estate had a net tightening impact on housing-loan standards, while energy performance had a net easing effect; banks also reported a slight tightening effect associated with capital costs connected with climate exposure.

⁵⁸ ALLCOTT – GREENSTONE, *Is There an Energy Efficiency Gap?*, in *Journal of Economic Perspectives*, vol. 26, n. 1, 2012, pp. 3-28. The authors emphasise the need to distinguish specific investment inefficiencies and express caution regarding claims of a pervasive energy-efficiency gap.

As financing constraints assume particular importance for the Climate-Valuation-Credit Loop, it is worth considering the Commission's 2025 guidance on Article 17 EPBD, which expressly identifies lack of solvency, lack of liquidity and upfront renovation costs among the barriers that may prevent building owners from undertaking renovation.⁵⁹ In fact, the Directive consequently requires Member States to develop financial measures capable of addressing such obstacles and expressly refers to renovation mortgages, energy-efficiency loans, guarantee funds and mortgage portfolio standards. Thus, the final stage of the Loop is supported by a direct correspondence between an economic problem concerning underinvestment and a legal framework designed to facilitate investment in the transformation of the building stock.

Taken together, these contributions helps in identifying distinct transmission channels within a common structure,⁶⁰ and - in legal terms - the same sequence connects the EPBD and Data Act to the informational stage, Article 229 CRR to valuation, the Mortgage Credit Directive to mortgage decision-making, CRR and CRD VI to prudential risk transmission, and Article 17 EPBD to the financing of renovation.

Accordingly, at this stage of our regulatory analysis, the Climate-Valuation-Credit Loop can be represented as a sequence in which environmental and building data may affect valuation, which may produce an impact on collateral that, in turn, potentially influences the price and availability of credit. The latter determines, among

⁵⁹ European Commission, *Commission Notice providing guidance on new or substantially modified provisions of the recast Energy Performance of Buildings Directive (EU) 2024/1275*, OJ C, 18 December 2025, section 2.1. The guidance identifies lack of solvency, lack of liquidity and upfront costs among the barriers to renovation. See Directive (EU) 2024/1275, Art. 17, especially paras. 1, 3 and 7.

⁶⁰ In a nutshell, Akerlof helps explain why regulation seeks to improve information concerning real estate characteristics; Rosen explains how those characteristics may enter valuation; Stiglitz and Weiss show how increased risk can affect access to credit as well as its price; Kiyotaki and Moore provide the central feedback between asset value, collateral and borrowing capacity; Bernanke, Gertler and Gilchrist explain how the resulting financial effects may be amplified and become systemically relevant; and Allcott and Greenstone provide a framework for considering why the investment necessary to improve the asset may fail to occur.

other factors, the owner's capacity to undertake adaptation and renovation; and those investments subsequently affect the environmental risk and value of the real estate assets. And all the above goes requires a public intervention that may support a virtuous transition where finance remains available for improvements capable of reducing risk, as this Loop may generate an adverse feedback where risk-sensitive valuation contributes to a restriction of the financing required to mitigate the exposition to identified risk.⁶¹ In fact, the regulatory challenge concerns the coordination between accurate risk recognition and the availability of transition finance.

5. Norway provides a particularly instructive laboratory for observing how climate-related information can move from the general language of sustainability into the more operational domains of valuation, financial risk and credit. Its relevance derives from an unusual combination of institutional features: a sophisticated financial system, substantial household and bank exposure to real estate, a highly developed public information infrastructure, significant exposure to the economic consequences of the energy transition and, through the European Economic Area, close integration with the regulatory architecture of the European Union.⁶²

In this respect, an important starting point is the Norwegian Climate Risk Commission established by the Government and chaired by Martin Skancke. Its 2018 report, *Climate Risk and the Norwegian Economy*, conceptualised climate risk as a

⁶¹ From this interaction emerges a further question that can be described as a prudential transition paradox. A lender may rationally respond to higher physical or transition risk by applying more conservative valuations or more restrictive lending conditions in accordance with sound risk management and the prudential framework. If comparable reactions occur across a significant part of the banking sector, financing may become less available precisely for the properties requiring the greatest investment in energy renovation or climate adaptation. Such an outcome can preserve the risk that the prudential response seeks to manage and may eventually reinforce its financial consequences.

⁶² In particular, it is possible to hypothesize that the Norwegian experience allows the Climate-Valuation-Credit Loop to be observed at an intermediate stage of development, in which climate risk is progressively transformed from an external environmental consideration into a measurable variable capable of influencing financial decisions.

problem characterised by uncertainty, potentially severe outcomes, long time horizons and limited historical comparability.⁶³ Particularly significant for the present analysis is the Commission's insistence that climate risk should be integrated into ordinary decision-making rather than treated as a separate field of environmental policy. The Report advocated continuous monitoring, accumulation of knowledge, scenario analysis and the incorporation of climate-related information into both public and private decision processes. It thus anticipated an institutional logic that later became increasingly visible in European financial regulation: information acquires regulatory relevance when it is capable of modifying the assessment of future economic outcomes.

A parallel development can be observed in the work of the Norwegian Nature Risk Commission that extended this reasoning beyond climate change. NOU 2024:2, *In Interaction with Nature*, examines how economic activities depend upon and affect ecosystems and how the deterioration of nature may generate risks for industries, sectors and society.⁶⁴ This extension matters for the Loop because it reinforces the proposition that environmental variables need not remain outside conventional financial analysis. Climate and nature risks may affect operating costs, insurability, productive capacity, demand, asset durability and ultimately expected cash flows. Once those effects become economically material, the legal and financial distinction between "environmental" information and "financial" information becomes increasingly difficult to sustain.

⁶³ NORWEGIAN CLIMATE RISK COMMISSION, *Climate Risk and the Norwegian Economy*, NOU 2018:17, Ministry of Finance, Oslo, 2018, especially Chapters 3-7. The Commission emphasised the high uncertainty surrounding climate risk, the limited predictive value of historical experience, the need for continuous knowledge accumulation and the importance of integrating scenario analysis into both public and private decision-making.

⁶⁴ NORWEGIAN NATURE RISK COMMISSION, *In Interaction with Nature - Nature Risk for Industries, Sectors and Society at Large in Norway*, NOU 2024:2, Ministry of Climate and Environment, Oslo, 2024. The Commission examines dependencies and impacts linking economic activity and nature and develops a framework for analysing and managing nature-related risks in both the public and private sectors.

More concretely, Norges Bank has gradually translated this conceptual framework into financial-stability analysis. Already in its 2019 *Financial Stability Report*, the Bank recognised that climate risk may affect credit losses, funding conditions and asset prices and that central banks and supervisors can contribute to financial stability by encouraging financial institutions to incorporate climate factors into their risk assessments.⁶⁵ The point is especially important from the perspective developed in this article. The relevant movement is not simply from climate change to financial risk in the abstract. It proceeds through identifiable economic variables: the profitability and debt-servicing capacity of borrowers, the value of assets used as collateral, insurance costs and the investment expenditure required for adaptation or transition.

Significantly, subsequent work by Norges Bank has made this transmission mechanism increasingly granular. A 2021 Staff Memo on *Climate Risk and Banks' Loans to Firms* combined information from Statistics Norway, the Norwegian Environment Agency, Finanstilsynet, the Norwegian Mapping Authority and other public sources in order to quantify Norwegian banks' exposures to transition and physical risks.⁶⁶ The analysis is particularly relevant for real estate because it uses energy labelling of commercial real estate to identify indirect transition exposure and geographical data to determine whether properties pledged as bank collateral are situated in areas exposed to storm surges, flooding and other physical hazards. Climate information is thereby attached to a specific asset, the asset is linked to a bank exposure and the resulting information becomes capable of entering the assessment of credit risk. This

⁶⁵ NORGES BANK, *Financial Stability Report 2019*, Chapter 4, "Climate Risk and the Financial System". The Bank identifies physical and transition risks as potentially relevant to credit losses, financial prices and funding conditions and stresses the role of central banks and supervisors in ensuring that climate risk enters financial risk assessments.

⁶⁶ HAUG, REIAKVAM, SOLHEIM, TURTVEIT and VATNE, *Climate Risk and Banks' Loans to Firms*, Norges Bank Staff Memo No. 7/2021, 17 December 2021. The study combines official emissions and climate-exposure data with banks' sectoral lending exposures and uses energy labels and geographical information to analyse climate risk in commercial real estate collateral.

could be regarded as evidence of the initial transmission channels of the Credit Loop.

In parallel, the 2023 *Financial Stability Report* made the link between climate characteristics and real estate prices still more explicit. Norges Bank observed that physical climate risk may reduce collateral values and make some properties more difficult to insure, while poor energy performance may increase operating costs and reduce tenants' willingness to pay for inefficient commercial buildings.⁶⁷ The Bank used Land Registry information to identify properties serving as collateral and intersected those data with geographical risk zones for storm surges, floods, landslides and quick clay. In other words, a physical characteristic of location becomes a data point; the data point becomes a risk indicator; and the risk indicator can enter the economic assessment of an asset that simultaneously constitutes a productive asset, an investment and bank collateral.⁶⁸

Correspondingly, the Norwegian experience illustrates why the measurement of climate risk cannot be reduced to historical loss data. Climate change modifies the probability distribution itself, while transition policies, technological innovation and changing preferences may transform asset values before physical losses occur. This explains the growing importance of scenario analysis and climate stress testing. Norges Bank has used scenarios developed by the Network for Greening the Financial System to assess the effects of climate-related changes on Norwegian banks, while Finanstilsynet has separately analysed the effects of orderly and disorderly transition

⁶⁷ NORGES BANK, *Financial Stability Report 2023 H1*, especially the section "Climate Risk and Energy Performance Can Affect Selling Prices". The analysis expressly observes that physical climate risk may reduce banks' collateral values and affect insurability, while poor energy performance can increase costs and reduce the attractiveness of commercial buildings. It uses Land Registry data and geographical hazard zones to locate bank collateral exposed to storm surges, flooding, landslides and quick clay.

⁶⁸ See URBANI, *Governo del territorio e rischio climatico: profili giuridici della pianificazione urbanistica in chiave ambientale*, in *Rivista Giuridica dell'Edilizia*, 2022; URBANI - CIVITARESE MATTEUCCI, *Diritto urbanistico. Organizzazione e rapporti*, Giappichelli, 2017 on town planning and climate risk considerations which represent a legal complement to the financial analysis developed in this paragraph considering that the Climate-Valuation-Credit Loop operates on real estate assets whose location, permitted uses, exposure to natural hazards and regulatory constraints are determined, at the first instance, by town planning applicable laws and territorial governance.

pathways on bank loan losses.⁶⁹ More recently, Norges Bank's 2026 solvency stress test combined severe climate-related disasters with an abrupt acceleration in climate policy and expressly examined the channels through which higher costs, weaker economic activity, declining real estate prices and tighter credit conditions could interact.⁷⁰ The analysis is especially revealing because it simultaneously recognises that transition may increase bank losses and that substantial access to new credit will be required to finance the investment generated by that same transition.

Within this framework, the Government Pension Fund Global provides a second and complementary dimension of the Norwegian laboratory. Norges Bank Investment Management has treated climate change as a financial risk to the Fund and has developed portfolio-level scenario analysis covering both transition and physical risks.⁷¹ In the real estate portfolio, the approach is necessarily asset-specific. Physical exposure depends on the geo-location and resilience of individual properties, while transition risk depends inter alia on emissions, energy use, regulatory requirements and evolving tenant preferences. NBIM has therefore employed geographically granular climate data, external scenario providers and asset-specific analysis to estimate the exposure of real estate investments to hazards including flooding, extreme heat, heavy precipitation and sea-level rise.

⁶⁹ FINANSTILSYNET, *Climate Risk in Norwegian Banks*, climate scenario analysis based on NGFS and Bank of England pathways; Norges Bank, *Financial Stability Report 2024 H1*, on climate transition, loan losses and additional investment needs. The analyses illustrate the difference between orderly and disorderly transition scenarios and the potential interaction between transition costs and banks' credit exposures.

⁷⁰ NORGES BANK, *Financial Stability Report 2026 H1*, solvency stress test. The scenario combines climate-related disasters with an abrupt transition and traces their consequences through higher costs, declining real estate prices, borrower losses and tighter lending standards. The Report also emphasises that substantial access to credit is necessary because climate transition itself generates new investment needs.

⁷¹ NORGES BANK INVESTMENT MANAGEMENT, *Climate Change as a Financial Risk to the Fund*, Asset Manager Perspective, 2021, especially pp. 15-18. The analysis distinguishes physical and transition risk, examines climate Value-at-Risk and applies geographically granular scenario analysis to the Fund's global real estate portfolio. It also expressly discusses the limits generated by uncertainty, incomplete data, model assumptions and nonlinear interactions.

Conceptually, the progression is particularly significant. Climate risk becomes measurable because several different information infrastructures are connected: geographical databases identify exposure; building information describes energy characteristics; climate scenarios provide forward-looking estimates; market information supplies prices and expected returns; and financial models translate those variables into risk and valuation outputs. In its current climate strategy, NBIM goes further by measuring transition risk in its unlisted real estate portfolio against 1.5°C decarbonisation pathways developed by the Carbon Risk Real Estate Monitor (CRREM), using the resulting carbon budgets to prioritise retrofits and investment decisions.⁷² Its 2030 Climate Action Plan also envisages the use of proprietary climate analytics, artificial intelligence and portfolio-management tools to integrate sustainability information into investment analysis.

For this reason, the Norwegian developments can usefully be interpreted through the concept of computational sustainability. The term was originally developed in computer and information science to describe the use of computational models, optimisation methods and data-intensive techniques to address complex trade-offs among environmental, economic and societal objectives.⁷³ In the present context, the expression is employed in a more specific legal-economic sense. It describes the process through which sustainability objectives become operational because environmental phenomena are transformed into data, data into risk

⁷² NORGES BANK INVESTMENT MANAGEMENT, *2025 Climate Action Plan*; NBIM, *2030 Climate Action Plan*, 2025; NBIM, *Responsible Investment 2025*. NBIM uses CRREM 1.5°C pathways to measure transition risk in unlisted real estate and employs the resulting carbon budgets to prioritise retrofits and investment decisions. The 2030 Plan also refers expressly to proprietary climate analytics, AI-supported analysis and integration of climate information into investment processes.

⁷³ GOMES, “Computational Sustainability: Computational Methods for a Sustainable Environment, Economy, and Society”, *The Bridge*, Vol. 39, No. 4, 2009, pp. 5-13; GOMES et AL., “Computational Sustainability: Computing for a Better World and a Sustainable Future”, *Communications of the ACM*, vol. 62, No. 9, 2019, pp. 56-65, DOI 10.1145/3339399. Computational sustainability is conventionally understood as the development of computational methods for balancing environmental, economic and societal objectives. The present article adapts the concept to describe the informational and modelling infrastructure through which sustainability factors become financially actionable.

indicators, risk indicators into financial parameters and financial parameters into decisions concerning valuation, investment and credit. The concept therefore identifies the informational infrastructure underlying the Loop rather than suggesting that an algorithm can itself determine the appropriate normative balance between sustainability, stability and social protection.

Yet this computational turn also exposes a fundamental regulatory problem. A model can process only the variables that have been defined, measured and made available to it. Climate-risk assessment therefore depends on legal institutions long before the final lending or investment decision occurs. Rules determine which companies must report sustainability information, how environmental activities are classified, what metrics must be used, which data must be verified, and which risks must be incorporated into governance and financial decision-making. The quality of climate-sensitive valuation is consequently inseparable from the quality of the regulatory architecture producing its inputs. Indeed, NBIM itself has emphasised that scenario analysis remains constrained by data quality, modelling assumptions, uncertainty and difficulties in capturing nonlinear interactions between physical and transition risks.⁷⁴ Computational sophistication cannot eliminate these epistemic constraints; it makes the legal organisation of information increasingly consequential.

From a legal perspective, Norway's participation in the EEA gives this process a particularly useful comparative character. The Norwegian Act on Disclosure of Sustainability Information in the Financial Sector and a Framework for Sustainable Investments, adopted in December 2021 and effective from 1 January 2023, incorporates both Regulation (EU) 2019/2088 on sustainability-related disclosures in the financial services sector and Regulation (EU) 2020/852 establishing the EU

⁷⁴ NORGES BANK INVESTMENT MANAGEMENT, *Climate Change as a Financial Risk to the Fund*, cit., pp. 16-18. NBIM observes that climate scenarios simplify complex real-world relationships, depend heavily on input data and assumptions, have difficulty capturing nonlinear and self-reinforcing relationships and may underestimate physical risks where second- and third-order effects are omitted.

Taxonomy into Norwegian law.⁷⁵ The significance of this incorporation goes beyond regulatory convergence. SFDR itself is built upon an informational theory of financial regulation. Recital 10 expressly identifies the reduction of principal-agent information asymmetries as one of its purposes, whereas Recital 19 connects the consideration of sustainability factors with the resilience of the real economy and the stability of the financial system.⁷⁶ These propositions correspond closely to the Norwegian movement from disclosure towards measurable financial risk.

Accordingly, the Taxonomy Regulation supplies another layer of the same infrastructure. As discussed above, its initial Recitals connect the reorientation of capital flows with sustainable and inclusive growth and emphasise the need for a shared understanding of environmentally sustainable activities.⁷⁷ In computational terms, classification is indispensable because data cannot become comparable financial inputs unless the underlying concepts are sufficiently standardised. The Taxonomy therefore performs an epistemic as well as a regulatory function: it determines the legal criteria by which economic activities can be recognised as environmentally sustainable and thereby creates categories that can subsequently enter reporting systems, investment analysis and financial models.

⁷⁵ Norway, Act of 22 December 2021 No. 161 on Disclosure of Sustainability Information in the Financial Sector and a Framework for Sustainable Investments (*Lov om offentliggjøring av bærekraftsinformasjon i finanssektoren og et rammeverk for bærekraftige investeringer*), paras. 2-3, in force from 1 January 2023. Sections 2 and 3 incorporate, through the EEA Agreement, Regulation (EU) 2019/2088 and Regulation (EU) 2020/852 respectively into Norwegian law; para. 4 entrusts supervision to Finanstilsynet.

⁷⁶ Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (“SFDR”), OJ L 317, 9 December 2019, Recitals 8-10 and 19 and Arts. 2(22), 3 and 4. Recital 10 expressly characterises harmonised sustainability disclosure as a means of reducing principal-agent information asymmetries, while Recital 19 links consideration of sustainability factors to the resilience of the real economy and the stability of the financial system.

⁷⁷ Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment (“Taxonomy Regulation”), OJ L 198, 22 June 2020, especially Recitals 6 and 9-12 and Arts. 1, 3, 8 and 9. The Regulation establishes common criteria for determining whether an economic activity qualifies as environmentally sustainable and thereby creates a common classificatory infrastructure for sustainable investment. See also Recitals 34–35 on environmental integrity and minimum social safeguards.

At a further stage, the Corporate Sustainability Reporting Directive reinforces the informational chain. Recital 9 of Directive (EU) 2022/2464 identifies investors and civil-society actors as primary users of sustainability information and expressly associates improved reporting with a stable, sustainable and inclusive economic system. Recitals 10 and 11 stress the growing role of sustainability data providers and the increasing demand for corporate sustainability information generated, inter alia, by investors' awareness of the financial implications of sustainability risks.⁷⁸ Most importantly, Recital 29 codifies the double-materiality perspective: undertakings must report both how sustainability matters affect their development, performance and position and how their own activities influence people and the environment.⁷⁹ The direction of informational perspective is therefore expressly bidirectional, just as the Climate–Valuation–Credit Loop itself operates through feedback rather than through a single linear chain.

Ultimately, Norway has implemented this reporting architecture within its domestic accounting law. New sustainability-reporting provisions entered into force on 1 November 2024 and introduced the CSRD framework progressively into Norwegian law. Section 2-4 of the Norwegian Accounting Act reflects the double-materiality structure by requiring information necessary both to understand the undertaking's impacts on sustainability matters and to understand how sustainability

⁷⁸ Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 as regards corporate sustainability reporting (“CSRD”), OJ L 322, 16 December 2022, Recitals 1 and 9–11. Recital 1 characterises the European Green Deal as the Union's new growth strategy; Recital 9 identifies investors and civil-society actors as primary users of sustainability information and links such reporting to a stable, sustainable and inclusive economic system; Recitals 10-11 emphasise comparability, the role of data providers and the financial relevance of sustainability risks.

⁷⁹ Directive (EU) 2022/2464, Recital 29 and the amendments introduced into Arts. 19a and 29a of Directive 2013/34/EU. Recital 29 expressly defines the “double materiality perspective” as requiring separate consideration of the impacts of an undertaking on people and the environment and of the effects of sustainability matters upon the undertaking itself.

matters affect its development, financial position and performance.⁸⁰ The Norwegian laboratory is thus not external to the European regulatory project. It combines domestic institutions and unusually rich datasets with legal categories increasingly derived from the EU/EEA framework.

Consequently, the Norwegian experience helps clarify the role of law within the Climate-Valuation-Credit Loop. Law does more than compel disclosure after economic reality has already been formed. It contributes to constructing the informational architecture through which environmental reality becomes financially legible. Public registers, sustainability reporting, classification systems, energy data and climate scenarios create inputs; banks, investors and supervisors combine those inputs through increasingly sophisticated models; and the outputs can influence valuations, collateral assessments, portfolio choices and lending decisions. The resulting process may be described as a transition from disclosed sustainability to computational sustainability. Its importance lies precisely in the fact that sustainability ceases to operate solely as a qualitative objective and becomes part of the informational structure through which economic actors calculate risk. Once that transformation occurs, however, a further question necessarily arises: how should the legal order govern the economic changes generated when climate-sensitive information begins systematically to alter relative asset values and the allocation of credit?

6. The analysis developed herein suggests that the economic and legal analysis of the Climate–Valuation–Credit Loop can provide a useful insight for understanding a regulatory transformation that is already taking place within European real estate

⁸⁰ Norway, Act of 21 June 2024 No. 42 amending the Accounting Act and related legislation on sustainability reporting, in force from 1 November 2024; Norwegian Accounting Act (*regnskapsloven*), paras. 2–4. The Norwegian provision requires reporting necessary both to understand the undertaking’s impact on sustainability matters and to understand how sustainability matters affect its development, position and results, thereby reproducing the double-materiality logic of the CSRD. See Ministry of Finance, Prop. 57 L (2023–2024), *Amendments to the Accounting Act etc. (Sustainability Reporting)*.

finance, as it emerges from the interaction of different bodies of EU regulations and directives that progressively connect environmental information, RE characteristics, valuation, collateral recognition and credit decisions.⁸¹

Accordingly, it is possible to present an interim conclusion considering that the legal foundations of the proposed Loop are already dispersed throughout the existing regulatory framework. From an economic perspective, the same interaction can be reconstructed through established theories concerning information, valuation, collateral and credit.⁸²

The principal result of this stage of the analysis refers to the possibility that climate risk is part of a transmission mechanism that is conditional and institutionally mediated, as environmental and building-related characteristics become more financially relevant insofar as they are translated into information capable of affecting expected cash flows, asset values, probabilities of default, losses given default or other variables entering lending decisions.⁸³ Obviously, the intensity of this transmission

⁸¹ As it has been represented above, the recast Energy Performance of Buildings Directive contributes to the production and circulation of increasingly granular information concerning buildings; CRR III expressly recognises the relevance of environmental and resilience-related characteristics for prudential real estate valuation; CRD VI and the EBA framework require ESG risk drivers to be incorporated into ordinary risk-management processes; and the Mortgage Credit Directive preserves the distinction between the assessment of the borrower and the valuation of the real estate asset securing the credit relationship.

⁸² It is worth recalling that Akerlof helps explain why incomplete information concerning asset quality may impair the functioning of markets; Rosen provides the analytical connection between real estate characteristics and value; Stiglitz and Weiss show why changes in perceived risk may affect the availability of credit as well as its price; Kiyotaki and Moore identify the feedback between asset values, collateral and borrowing capacity; Bernanke, Gertler and Gilchrist explain how such financial frictions may amplify an initial disturbance; and the literature on the energy-efficiency gap clarifies why economically beneficial investments may nevertheless fail to occur when information, liquidity or financing constraints intervene. These models were developed for different purposes, yet their combination allows the individual stages of the Climate–Valuation–Credit Loop to be identified without requiring the construction of an autonomous economic theory.

⁸³ At this stage, the Climate-Valuation-Credit Loop can therefore be represented as a regulatory-relevant sequence in which environmental and building-related information contributes to valuation; valuation may affect the prudential and economic relevance of collateral; collateral may influence the terms and availability of finance; and access to finance may, in turn, determine the capacity of owners to undertake renovation or adaptation capable of modifying the environmental characteristics and future value of the asset. This interaction may generate different trajectories. Where financing remains available for

depends on data quality, valuation methodologies, regulatory design, contractual structures, market conditions and the capacity of individual borrowers to adapt. Hence, the Loop describes a possible feedback mechanism embedded in the interaction between law and finance rather than a deterministic sequence.

The Norwegian experience reinforces this conclusion. Norway shows how climate-sensitive financial analysis increasingly depends on the capacity to connect several informational infrastructures: geographical databases, energy-performance data, climate scenarios, real estate registers, financial exposures and forward-looking risk models. In this respect, the movement from disclosed sustainability to what has been described here as computational sustainability is especially significant. Environmental characteristics acquire financial relevance because they become capable of being measured, classified and incorporated into models through which banks, investors and supervisors assess future economic outcomes. Law performs a constitutive role within this process because it determines the categories, disclosure obligations, classifications and risk-management requirements through which environmental phenomena become financially legible.⁸⁴

All the above suggests that the present research must continue,⁸⁵ as - once

economically viable improvements, risk-sensitive valuation may support renovation, resilience and the long-term quality of the European real estate stock. Where, instead, environmental vulnerability leads to a restriction of the financing required to remedy that vulnerability, the same mechanism may contribute to an adverse feedback process.

⁸⁴ This observation also clarifies the relationship between regulation and technological innovation. More granular data and increasingly sophisticated valuation techniques may improve the accuracy with which climate and building characteristics are reflected in financial decisions. However, computational sophistication does not eliminate uncertainty. Models remain dependent upon assumptions, data selection, time horizons and the legal definitions that structure their inputs. Accordingly, the development of climate-sensitive valuation raises a regulatory question that extends beyond technological efficiency: the legal system must determine when environmental information becomes sufficiently reliable and financially material to justify consequences for valuation, collateral recognition and credit allocation.

⁸⁵ The present article therefore leaves the normative implications deliberately open. Its contribution has been to identify the legal and economic architecture through which climate information can become valuation, valuation can become collateral risk, and collateral risk can enter the allocation of credit. Hence, the subsequent inquiry will concern the manner in which law should govern that architecture so

climate-sensitive information becomes capable of altering real estate asset values and the allocation of credit - the legal governance of the distributive consequences generated by the Loop and the conditions under which individually rational valuation and lending decisions may produce broader effects on real estate owners, and their capacity to finance the enhancement itself. Accordingly, the next stage of the research will have to examine how private law, public intervention and transition finance can interact in governing those effects and in protecting individual rights, and whether it is possible to identify a basis for a more effective regulatory response.

that the recognition of environmental risk remains compatible with financial stability, economic efficiency, the financing of adaptation and the preservation of the private positions affected by the transition.

TOWARDS A NEURO-INCLUSIVE LABOUR MARKET: THE REGULATORY AND POLICY CONTEXT, INCLUSIVE HR PRACTICES AND THE 5P TRANSITION FRAMEWORK

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ABSTRACT: *This article develops a conceptual and implementation framework for supporting autistic people in higher education and during the transition to, and retention in, employment. It examines the Erasmus+ In4Aut project (“Integration programme for people with autism”) through a qualitative documentary case analysis of project documentation and five course modules. The article addresses a practical and conceptual gap: although research on neurodiversity, universal design and supported employment offers important principles and interventions, institutions still*

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need an integrated process model linking environmental assessment, institutional preparation, transition support and longitudinal evaluation across higher education and employment. The proposed 5P framework (Understanding, Design, Preparation, Transition and Measurement) tries to organise these activities and specifies potential actors, actions, resources and indicators. It is presented as a theory-informed framework derived from project materials, not as an empirically validated intervention or evidence of causal impact. The analysis distinguishes planned project outputs from demonstrated outcomes and proposes an evaluation design prioritising sustained employment, job quality and wellbeing. It also considers the relevant European and Italian legal context, including reasonable accommodation, accessibility, artificial intelligence and data protection. The article's contribution is to connect institutional design and rights-based obligations with organisational decision-making and an evaluable transition pathway. Further validation requires transparent reporting of implementation, meaningful participation by autistic people and follow-up evidence from students, graduates and employers.

SUMMARY: 1. Introduction. - 2. Theoretical foundations: from deficit to environmental design. - 3. Person-environment fit as the basis for designing inclusion. - 4. Universal Design for Learning and accessible teaching. - 5. Neuro-inclusivity as an organisational value: the regulatory and policy context. - 6. In4Aut project and workplaces inclusion method. - 7. The 5P framework and practical application. - 8. Implementation, participation and evaluation. - 9. Discussion, limitations and conclusions.

1. Higher education institutions increasingly express a commitment to diversity, accessibility and inclusion. In practice, however, autistic people continue to face numerous barriers in their studies, work placements, transition to employment and retention of stable employment. This problem should not be reduced to individual diagnostic, communication or adaptive difficulties. The focus needs to shift from the individual to the environment: the university, its procedures, the educational model,

career guidance, recruitment, onboarding, work organisation and communication culture.

The In4Aut project “Integration programme for people with autism”, project number 2023-2-PL01-KA220-HED-000180674, website <https://in4aut.mans.edu.pl/en> addresses precisely this gap. Its primary aim is to improve the inclusion of autistic people in the labour market by raising awareness amongst academic staff and employers, developing targeted courses, and supporting autistic people in their transition to employment. The project proposal identifies four key areas of activity: the development of a methodological framework and toolkit; the preparation and adaptation of a course provided as an open educational resource (OER); the development of university staff skills; and the dissemination and utilisation of the project’s results. Autistic people often possess skills highly valued by modern organisations accuracy, a systematic approach, attention to detail, commitment to quality and reliability yet standard academic and professional environments rely on unspoken social norms, imprecise communication, sensory overload and recruitment processes that measure social self-presentation rather than actual skills. Exclusion is thus often the result of a mismatch with the system, not a lack of individual potential.

The aim of this article is to present the In4Aut project as a model for the transition from stated commitments to inclusion to practical neuro-inclusivity in higher education and workplace organisations. The article is both conceptual and applied in nature. It is based on an analysis of project documents, draft educational outputs and the structure of the In4Aut modular course. The specific research gap addressed here is not the absence of principles for inclusion, nor the absence of employment support interventions. Supported employment, job coaching, reasonable accommodation and universal design each provide established approaches. The gap is the lack of an integrated, cross-setting implementation sequence in the materials examined here that connects university-level environmental redesign to employer preparation, the

transition into a specific job and longitudinal evaluation of job quality and wellbeing. The article therefore tries to explain: (1) how can the In4Aut materials be synthesised into a coherent transition framework; (2) what organisational responsibilities and resources are needed at each stage; and (3) what evaluation design could distinguish project outputs from meaningful outcomes? The contribution is a proposed process architecture, not a claim that the 5P model is superior to, or empirically more effective than, established supported-employment models.

2. The contemporary approach to supporting autistic people in higher education and the labour market is moving away from the deficit model, in which autism is interpreted as a set of limitations requiring compensation, therapy or individual adaptation. In its place, an environmental, competence-based and neuro-inclusive approach is emerging, in which the quality of the fit between a person's needs, strengths and functioning style and the structure of the educational or professional environment is of key importance.¹

This premise is consistent with In4Aut, which aims not only to raise awareness amongst academic staff and employers, but also to develop tools, a course and a methodology for designing more accessible learning and working environments. The deficit model focuses on difficulties: a different communication style, a need for predictability, difficulties in interpreting social norms, sensory sensitivity or increased cognitive load in ambiguous situations. Whilst useful for diagnostic purposes, it becomes limiting in education, career guidance and human resources management,

¹ DOYLE (2020). Neurodiversity at work: A biopsychosocial model and the impact on working adults. *British Medical Bulletin*, 135(1), 108–125. <https://doi.org/10.1093/bmb/ldaa021>; SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>; WAISMAN-NITZAN, SCHREUER & GAL (2020). Person, environment, and occupation characteristics: What predicts work performance of employees with autism? *Research in Autism Spectrum Disorders*, 78, 101643. <https://doi.org/10.1016/j.rasd.2020.101643>.

where an autistic person is assessed through the lens of what they ‘do not do in the same way as others’ rather than the conditions in which they can learn, work and develop.²

Research confirms that these difficulties are not solely individual. Davis, Watts and López (2021) found in a systematic review that autistic students often face academic, social, communication, sensory and mental health difficulties, and that support is underdeveloped or unused because students do not disclose; they stress the need for staff training.³ Clouder and others (2020) add that the existence of support services does not guarantee accessibility: there is a gap between needs and support, exacerbated by fear of stigmatisation.⁴

Module 1 of In4Aut envisages precisely such a shift from a medicalised, deficit-based understanding of autism to a competency-based model grounded in neurodiversity, in which autistic people are viewed as individuals with different functioning profiles that can be a source of valuable skills in education and work.⁵

The neurodiversity paradigm posits that neurological differences are a natural part of human diversity rather than merely a pathology. Autism, ADHD, dyslexia, dyspraxia and other forms of neurodivergence should therefore be analysed not only in medical terms but also in social, educational and organisational terms.⁶ Doyle (2020)

² BURY, HEDLEY, ULJAREVIĆ, & GAL (2020). The autism advantage at work: A critical and systematic review of current evidence. *Research in Developmental Disabilities*, 105, 103750. <https://doi.org/10.1016/j.ridd.2020.103750>; DOYLE (2020). Neurodiversity at work: A biopsychosocial model and the impact on working adults. *British Medical Bulletin*, 135(1), 108–125. <https://doi.org/10.1093/bmb/ldaa021>.

³ DAVIS, WATTS, & LÓPEZ (2021). A systematic review of firsthand experiences and supports for students with autism spectrum disorder in higher education. *Research in Autism Spectrum Disorders*, 84, 101769. <https://doi.org/10.1016/j.rasd.2021.101769>.

⁴ CLOUDER, KARAKUS, CINOTTI, FERREYRA, AMADOR FIERROS & ROJO (2020). Neurodiversity in higher education: A narrative synthesis. *Higher Education*, 80, 757–778. <https://doi.org/10.1007/s10734-020-00513-6>.

⁵ IN4AUT CONSORTIUM. (2026a). Module 1: Autism – an opportunity for a great employee. In4Aut project course material.

⁶ DOYLE (2020). Neurodiversity at work: A biopsychosocial model and the impact on working adults. *British Medical Bulletin*, 135(1), 108–125. <https://doi.org/10.1093/bmb/ldaa021>.

argues that understanding neurodiversity at work requires a biopsychosocial approach encompassing both individual functioning and the social, organisational and legal conditions of participation.

The paradigm shifts the question from ‘how can we reduce difference?’ to ‘how can we design an environment in which difference does not lead to exclusion?’.⁷ In higher education, this means moving away from a uniform model of the student who functions seamlessly in lectures, group seminars and oral presentations; in workplaces, challenging the assumptions about the ‘ideal’ employee: socially flexible, tolerant of high sensory stimulation and adept at interpreting informal norms.

Organisations’ interest in employing neurodivergent individuals is growing, but research and practice must move beyond the simplistic notion of autism as an advantage.

Ezerins and co-authors (2024) show that research on autism and employment spans management, disability studies and rehabilitation, and that organisations can actively improve the workplace experiences of neurodivergent people.⁸ Bury, Hedley, Uljarević and Gal (2020) caution that although attention to detail, tolerance for repetitive tasks and specialised interests are sometimes reported, the empirical evidence is limited and should not lead to stereotyping; an approach based on individual profiles is needed.⁹

3. The social model of disability posits that disability arises from the relationship

⁷ DOYLE. Neurodiversity at work: A biopsychosocial model and the impact on working adults. *British Medical Bulletin*, 135(1), 108–125. <https://doi.org/10.1093/bmb/ldaa021>; MILTON (2012). On the ontological status of autism: The double empathy problem. *Disability & Society*, 27(6), 883–887. <https://doi.org/10.1080/09687599.2012.710008>.

⁸ EZERINS, SIMON, VOGUS, GABRIEL, CALDERWOOD & ROSEN (2024). Autism and employment: A review of the “new frontier” of diversity research. *Journal of Management*, 50(3), 1102–1144. <https://doi.org/10.1177/01492063231193362>

⁹ BURY, HEDLEY, ULJAREVIĆ & GAL (2020). The autism advantage at work: A critical and systematic review of current evidence. *Research in Developmental Disabilities*, 105, 103750. <https://doi.org/10.1016/j.ridd.2020.103750>

between the person and environmental, organisational and social barriers:¹⁰ educational or vocational difficulties of autistic people reflect also inaccessible, neurotypically designed systems.

In higher education, barriers include unclear syllabuses, fluctuating requirements, a lack of pre-class materials, overwhelming sensory environments, unstructured group work, assessment rewarding rapid verbal responses, complicated administrative procedures and the absence of a clear point of contact.¹¹ In organisations they include the traditional job interview based on self-presentation, unclear onboarding, informal communication, assessment of social style rather than outcomes, excess stimuli and a lack of predictable feedback channels.¹² Module 3 of In4Aut adopts this interpretation: the main barrier is the mismatch between the person's profile and rigid, opaque and unpredictable systems.¹³

Responsibility for the success and wellbeing of autistic students cannot rest solely with the individual. Janse van Rensburg and Liang (2025) propose a community-based framework in which it is shared by students, staff and the institution, and call

¹⁰ MILTON (2012). On the ontological status of autism: The double empathy problem. *Disability & Society*, 27(6), 883–887. <https://doi.org/10.1080/09687599.2012.710008>; SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>.

¹¹ BARRERA CIURANA & MOLINER GARCÍA (2024). ‘How does universal design for learning help me to learn?’: students with autism spectrum disorder voices in higher education. *Studies in Higher Education*, 49(6), 899–912. <https://doi.org/10.1080/03075079.2023.2259932>; DAVIS, WATTS & LÓPEZ (2021). A systematic review of firsthand experiences and supports for students with autism spectrum disorder in higher education. *Research in Autism Spectrum Disorders*, 84, 101769. <https://doi.org/10.1016/j.rasd.2021.101769>; GRIFUL-FREIXENET, STRUYVEN, VERSTICHELE & ANDRIES (2017). Higher education students with disabilities speaking out: Perceived barriers and opportunities of the Universal Design for Learning framework. *Disability & Society*, 32(10), 1627–1649. <https://doi.org/10.1080/09687599.2017.1365695>

¹² SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>; WAISMAN-NITZAN, SCHREUER & GAL (2020). Person, environment, and occupation characteristics: What predicts work performance of employees with autism? *Research in Autism Spectrum Disorders*, 78, 101643. <https://doi.org/10.1016/j.rasd.2020.101643>.

¹³ IN4AUT CONSORTIUM. (2026c). Module 4: Specific Models and Ways to Work Inclusively with People with Autism. In4Aut project course material.

for reducing the pressure to ‘mask’.¹⁴ In4Aut can thus be seen as an institutional learning project that equips universities and employers to transform their structures – through a toolkit, a modular course, staff training and a pilot – rather than merely preparing autistic people to function in existing ones.¹⁵

A key theoretical approach is person–environment fit (person–job, person–organisation, person–group, person–supervisor). Kristof-Brown, Zimmerman and Johnson (2005) demonstrated that fit is significantly associated with attitudes, performance, stress, turnover and retention. For autistic people it concerns not only qualifications but also communication style, sensory conditions, task structure, predictability, feedback and team culture; Waisman-Nitzan, Schreuer and Gal (2020) showed that work performance and self-efficacy are explained only by the interplay of individual, environmental and task characteristics.

In Module 2 of In4Aut, the transition from higher education to the labour market is described as readjustment between systems that differ in logic and expectations. Higher education is typically predictable, with explicit assessment criteria and a stable semester rhythm; the labour market is more often based on informal norms, rapid adaptation, ambiguous communication and relational expectations. This can lead to underutilised potential, delayed entry or unstable employment despite adequate skills.¹⁶ Preparing autistic students for work should therefore include analysis of the work environment, preparation of employers, design of recruitment and induction processes, and collaboration between universities, careers services, social organisations and businesses;¹⁷ employability stems from the

¹⁴ JANSE VAN RENSBURG & LIANG (2025). Improving autistic students’ experiences in higher education: Developing a community framework for individual autistic student and autistic community flourishing. *Autism in Adulthood*. <https://doi.org/10.1089/aut.2022.0079>

¹⁵ IN4AUT CONSORTIUM. (2024). KA220-HED-0C579935. In4Aut project proposal – Integration programme for people with autism. Erasmus+ KA220-HED project material.

¹⁶ IN4AUT CONSORTIUM. (2026b). Module 2: Access to the Labor Market of Graduates with Autism. In4Aut project course material.

¹⁷ EZERINS, SIMON, VOGUS, GABRIEL, CALDERWOOD & ROSEN (2024). *Autism and*

interaction between individual characteristics and organisational context.¹⁸

4. Universal Design for Learning (UDL) supports the transition from individual adjustments to the proactive design of accessible education: student diversity is taken into account when designing courses, materials, activities and assessment, rather than only when a student discloses a diagnosis or requests an adjustment.¹⁹

Ciurana and García (2024) indicate that UDL-based practices support autistic students by increasing transparency, flexibility and choice of participation. Durgungoz and Durgungoz (2025) add that involving neurodivergent students in teaching design raises engagement for all students, but that intensive group discussion can overwhelm some; flexible, including anonymous, forms of participation are needed.²⁰

In In4Aut, UDL is a cornerstone of course design. Module 1 envisages multiple ways of presenting content, acting and expressing knowledge, and engaging students: materials available before classes, transcripts and subtitles, clearly defined concepts, alternatives to oral examinations, assessment rubrics, predictable seminar formats and asynchronous participation.²¹ This matters particularly because some students do

employment: A review of the “new frontier” of diversity research. *Journal of Management*, 50(3), 1102–1144. <https://doi.org/10.1177/01492063231193362>; HEDLEY, ULJAREVIĆ, CAMERON, HALDER, RICHDALÉ & DISSANAYAKE (2017). Employment programmes and interventions targeting adults with autism spectrum disorder: A systematic review of the literature. *Autism*, 21(8), 929–941. <https://doi.org/10.1177/1362361316661855>; SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>.

¹⁸ IN4AUT CONSORTIUM. (2026b). Module 2: Access to the Labor Market of Graduates with Autism. In4Aut project course material.

¹⁹ GRIFUL-FREIXENET, STRUYVEN, VERSTICHELE & ANDRIES (2017). Higher education students with disabilities speaking out: Perceived barriers and opportunities of the Universal Design for Learning framework. *Disability & Society*, 32(10), 1627–1649. <https://doi.org/10.1080/09687599.2017.1365695>.

²⁰ DURGUNGOZ & DURGUNGOZ (2025). “Interactive lessons are great, but too much is too much”: Hearing out neurodivergent students, Universal Design for Learning and the case for integrating more anonymous technology in higher education. *Higher Education*. <https://doi.org/10.1007/s10734-024-01389-6>.

²¹ IN4AUT CONSORTIUM. (2026a). Module 1: Autism – an opportunity for a great employee. In4Aut project course material.

not disclose their diagnosis; designing for accessibility from the outset reduces dependence on formal disclosure and counteracts the fear of stigmatisation that limits the use of support.²²

Double empathy, masking and the hidden curriculum of institutions

An important complement is the concept of double empathy. Milton (2012) challenged the understanding of communication difficulties as a one-sided deficit of the autistic person: misunderstandings between autistic and non-autistic people are mutual and relational.²³

Responsibility for communication thus also lies with lecturers, mentors, recruiters and managers, which implies clear language, precise instructions, transparent criteria, written summaries and predictable meetings.

The concept is linked to masking: autistic people may conceal their natural ways of functioning to conform to expectations. Bradley and colleagues (2021) highlight its perceived negative impact on mental health; in education and work it may lead to overload, burnout, dropping out or unstable employment.²⁴ Module 1 of In4Aut accordingly requires participants to identify systemic barriers, including masking and double empathy, and to formulate institutional responses grounded in the social model.²⁵

²² CLOUDER, KARAKUS, CINOTTI, FERREYRA, AMADOR FIERROS & ROJO (2020). Neurodiversity in higher education: A narrative synthesis. *Higher Education*, 80, 757–778. <https://doi.org/10.1007/s10734-020-00513-6>; DAVIS, WATTS & LÓPEZ (2021). A systematic review of firsthand experiences and supports for students with autism spectrum disorder in higher education. *Research in Autism Spectrum Disorders*, 84, 101769. <https://doi.org/10.1016/j.rasd.2021.101769>.

²³ MILTON (2012). On the ontological status of autism: The double empathy problem. *Disability & Society*, 27(6), 883–887. <https://doi.org/10.1080/09687599.2012.710008>.

²⁴ BRADLEY, SHAW, BARON-COHEN & CASSIDY (2021). Autistic adults' experiences of camouflaging and its perceived impact on mental health. *Autism in Adulthood*, 3(4), 320–329. <https://doi.org/10.1089/aut.2020.0071>; JANSE VAN RENSBURG & LIANG (2025). Improving autistic students' experiences in higher education: Developing a community framework for individual autistic student and autistic community flourishing. *Autism in Adulthood*. <https://doi.org/10.1089/aut.2022.0079>.

²⁵ IN4AUT CONSORTIUM. (2026a). Module 1: Autism – an opportunity for a great employee. In4Aut project course material.

Environment design as a strategy for inclusion

The main conclusion is the need to move from reactive adaptation by the individual to proactive environmental design integral to teaching, recruitment, onboarding, communication, assessment and management.²⁶ Scott and colleagues (2019) highlight environmental factors as barriers and facilitators to employment and conclude that interventions should focus on context.²⁷ In academic settings this means structured syllabuses, predictable timetables, clear instructions, diverse forms of assessment, accessible digital materials and quiet spaces;²⁸ in the workplace, recruitment based on actual skills, work samples instead of interviews, clear onboarding, written instructions, predictable meetings, minimised sensory overload, mentoring and assessment based on measurable outcomes.²⁹

5. Neuro-inclusivity is best understood as an organisational value, not merely a legal or ethical obligation. Transparent procedures, precise criteria and accessible

²⁶ DOYLE (2020). Neurodiversity at work: A biopsychosocial model and the impact on working adults. *British Medical Bulletin*, 135(1), 108–125. <https://doi.org/10.1093/bmb/ldaa021>; SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>; WAISMAN-NITZAN, SCHREUER & GAL (2020). Person, environment, and occupation characteristics: What predicts work performance of employees with autism? *Research in Autism Spectrum Disorders*, 78, 101643. <https://doi.org/10.1016/j.rasd.2020.101643>.

²⁷ SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>.

²⁸ BARRERA CIURANA & MOLINER GARCÍA (2024). ‘How does universal design for learning help me to learn?’: students with autism spectrum disorder voices in higher education. *Studies in Higher Education*, 49(6), 899–912. <https://doi.org/10.1080/03075079.2023.2259932>; GRIFUL-FREIXENET, STRUYVEN, VERSTICHELE & ANDRIES (2017). Higher education students with disabilities speaking out: Perceived barriers and opportunities of the Universal Design for Learning framework. *Disability & Society*, 32(10), 1627–1649. <https://doi.org/10.1080/09687599.2017.1365695>.

²⁹ EZERINS, SIMON, VOGUS, GABRIEL, CALDERWOOD & ROSEN (2024). Autism and employment: A review of the “new frontier” of diversity research. *Journal of Management*, 50(3), 1102–1144. <https://doi.org/10.1177/01492063231193362>; HEDLEY, ULJAREVIĆ, CAMERON, HALDER, RICHDALÉ & DISSANAYAKE (2017). Employment programmes and interventions targeting adults with autism spectrum disorder: A systematic review of the literature. *Autism*, 21(8), 929–941. <https://doi.org/10.1177/1362361316661855>; SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>.

environments improve working conditions for entire teams.³⁰ Lindsay and colleagues (2018) identified potential organisational benefits of employing people with disabilities (retention, loyalty, innovation, productivity, inclusive culture), but, as Bury and co-authors (2020) note for autism, such benefits cannot be taken for granted: they depend on the individual's profile, the tasks and the quality of the environment. Module 5 of In4Aut treats neuro-inclusivity as a strategic, measurable and scalable priority, with skills mapping, job carving, sensory audits and neuro-inclusive KPIs. The approach of In4Aut thus shifts the question from 'How can an autistic person better adapt to the existing system?' to 'How can the educational and organisational system be redesigned to enable participation, wellbeing and the use of the skills of neurodivergent individuals?'

The project is being implemented at a time when the legal framework increasingly turns these principles into enforceable duties. The UN Convention on the Rights of Persons with Disabilities (Articles 24 and 27) and the EU Strategy for the Rights of Persons with Disabilities 2021–2030 frame inclusive education and employment as rights, and Directive 2000/78/EC requires employers to provide reasonable accommodation, a duty transposed in Italy by Legislative Decree 216/2003.³¹ These instruments are, however, largely reactive: they presuppose a recognised disability and an individual request, the very model that the universal-design logic of In4Aut seeks to move beyond.

Three recent developments are particularly relevant. First, the European

³⁰ EZERINS, SIMON, VOGUS, GABRIEL, CALDERWOOD & ROSEN (2024). Autism and employment: A review of the “new frontier” of diversity research. *Journal of Management*, 50(3), 1102–1144. <https://doi.org/10.1177/01492063231193362>; LINDSAY, CAGLIOSTRO, ALBARICO, MORTAJI & KARON (2018). A systematic review of the benefits of hiring people with disabilities. *Journal of Occupational Rehabilitation*, 28, 634–655. <https://doi.org/10.1007/s10926-018-9756-z>.

³¹ United Nations. (2006). Convention on the Rights of Persons with Disabilities; European Commission. (2021). Union of Equality: Strategy for the Rights of Persons with Disabilities 2021–2030; Council Directive 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in employment and occupation, Art. 5; Legislative Decree of 9 July 2003, n. 216, Art. 3(3-bis).

Accessibility Act (Directive (EU) 2019/882), transposed in Italy by Legislative Decree 82/2022, has applied since 28 June 2025 to products and services such as e-commerce, consumer banking and e-books, with AgID supervising services; universities and other public bodies remain subject to the Web Accessibility Directive and AgID guidelines for their websites and digital learning tools.³² Accessibility of materials, platforms and recruitment portals is thus a compliance issue, although these rules concern interface access and do not themselves address neurodivergent communication and sensory needs.

Second, in Italy for example, Law No. 134/2015 on the diagnosis, care and habilitation for people with autism spectrum disorder and Legislative Decree 62/2024 reforming disability assessment have changed the institutional setting. The latter introduces a single assistance basic assessment and an individualised, participatory life project, rolled out gradually since 2025 and extended in 2026 to more provinces. These measures fit the shift from deficit to environment, but they depend on diagnosis and certification, as does the targeted-placement scheme of Law 68/1999, and so leave open the education-to-work transition and the position of people who are undiagnosed or do not disclose. These legal instruments should not be treated as interchangeable. Universal design and accessibility concern the proactive removal of barriers in systems, services and environments; reasonable accommodation concerns an individualised response to a person's disability-related needs, subject to the applicable legal test and limits. In Italy, access to particular statutory schemes, including targeted employment placement under Law No. 68/1999, may depend on formal eligibility and assessment requirements. Those requirements should not be generalised into a claim that all-inclusive practices or all workplace adjustments require a formal autism diagnosis. Organisations should respond to barriers and to

³² Directive (EU) 2019/882 of 17 April 2019; Legislative Decree of 27 May 2022, n. 82; Directive (EU) 2016/2102 on the accessibility of the websites and mobile applications of public sector bodies.

needs voluntarily communicated by individuals, without attempting to infer or diagnose autism.

Third, automated recruitment tools now have a regulatory dimension. Under the EU Artificial Intelligence Act (Regulation (EU) 2024/1689), systems used for recruitment, selection and worker evaluation are high-risk, and emotion inference in the workplace and in education has been prohibited since February 2025 – both relevant to autistic candidates, whose facial expression, prosody or eye contact may be misread by automated screening. The application timetable for specific high-risk obligations has been the subject of proposed legislative changes. The applicable consolidated text and any final amendments should be checked against the Official Journal as of the date of submission; a proposal or provisional political agreement should not be described as binding law. Regardless of the precise timetable, organisations should assess recruitment and worker-management systems for compliance before deployment.

6. The *In4Aut* project – *Integration programme for people with autism* (In4Aut) – is being implemented in the higher education sector as part of the Erasmus+ KA220-HED programme. The project is scheduled to run for 30 months, with completion set for 30 April 2027. The project coordinator is the International Academy of Applied Sciences in Łomża. The partners are Luiss Libera Università Internazionale degli Studi Sociali Guido Carli from Italy, the University of Murcia from Spain, Ekpedefiki Paremvasi KDVM S.A. from Greece, and the InCREA Foundation from Poland. The project structure comprises five work packages. WP1 concerns project management. WP2 involves the preparation of a comprehensive framework for the design and delivery of education promoting the inclusion of autistic people. WP3 focuses on the development and adaptation of the In4Aut course. WP4 concerns the development of the technical capacity and skills of university staff to deliver the course. WP5 covers

dissemination activities and the utilisation of results.

The key planned outputs are: a toolkit for designing and implementing inclusive education; the modular In4Aut course, approved and integrated into the educational provision of partner universities; the training of 25 researchers, trainers and teachers; and the participation of 60 students in the pilot implementation of the course. As anticipated before this article is mainly based on an analysis of project documents and a content analysis of the educational materials developed in In4Aut: the Erasmus+ KA220-HED project proposal, presentations on project management, the five modules of the course and information on the project's outputs.

The study uses a qualitative, document-based case-study design. The corpus described in the project materials comprises the In4Aut project proposal, project-management presentations, the five In4Aut course modules and available descriptions of the project's planned outputs, including the support portal. These materials were selected because they directly describe the project's aims, intervention logic, training content and intended implementation. The analysis did not involve interviews, observation, a survey, an experimental comparison or access to individual-level participant data; accordingly, it cannot establish user experience, implementation fidelity or programme effectiveness. The analysis proceeded in three steps. First, project objectives, work packages, planned outputs and stated target groups were extracted. Second, each course module was examined for (a) its underlying concepts, (b) the barriers or processes it addresses, (c) the actors expected to act and (d) the proposed practices or tools. Third, recurring elements were synthesised into the five stages of the 5P framework. The 5P Approach was developed to help individuals and organizations see beyond single-dimensional explanations - shifting from isolated cause-finding to systemic understanding. While traditional models such as the 4M or Fishbone focus on categorizing causes, the 5P expands this logic into modern ecosystems where processes, people, platforms, and partnerships constantly interact

to shape performance.³³

The 5Ps are Purpose, People, Process, Platform, and Performance.

- Purpose. What is the question we're trying to answer? What is the problem we're trying to solve.
- People. Who should you involve? Who needs to know about this?
- Process. How will we answer this question, solve this problem?
- Platform. What tools do we need? What software will we use?
- Performance. How will we measure success? How do we know we solved the problem?³⁴

At its core, the 5P serves three fundamental purposes:

- To diagnose systemically. It guides users to look across multiple dimensions of a problem, connecting symptoms to sources and understanding interdependencies rather than isolated errors.
- To reflect holistically. It provides a common structure for teams to pause, observe, and align - turning reflection into a disciplined practice rather than an afterthought
- To navigate and improve continuously. It transforms reflection into direction, helping teams prioritize, design, and sustain improvements with balanced attention to both human and system factors.

The 5P is not a prescriptive tool, but a thinking system adaptable to different contexts, functions, and levels of analysis. It works as a mirror that reveals where alignment breaks, and as a compass that guides how to restore balance.³⁵

Ultimately, its purpose is to help organizations think in connections, act with balance, and learn through reflection, building resilience and continuous improvement into the way they operate. The synthesis was checked for alignment with the stated

³³ YEE (2025). The 5P Approach: Beyond a Tool, A Thinking System, Medium.com, Nov 4.

³⁴ ROBBERT (2024). The 5P Framework, newsletter: The 5P framework, ai content gap analysis.

³⁵ YEE (2025). The 5P Approach: Beyond a Tool, A Thinking System, Medium.com, Nov 4.

objectives and module content, and claims were framed as descriptions of project materials or as proposals where the documents did not provide implementation evidence. The framework is an interpretive synthesis by the authors, rather than a validated coding instrument; no inter-coder reliability statistic is claimed. The documentary record available for this analysis does not consistently identify version numbers or dates for every course-module file, nor does it establish that all outputs were final or publicly deployed. The project proposal and the modules are therefore treated as documents available to the authors at the time of analysis, and not as evidence that all planned activities have been completed. This incomplete version history limits exact replication of the document selection. The materials originate from the project being analysed, and the authors' shared analysis should consequently be understood as an interpretive case study rather than an independent audit of project delivery. The project's Erasmus+ funding and the authors' specific project roles should be disclosed in the journal's funding and competing-interests' statements.

The following section summarises the five modules as they are described in the available project materials; the operational synthesis and proposed indicators are presented separately below.

The In4Aut course can be considered as a model of neuro-inclusive education:

Module 1: autism and potential strengths. It introduces a fundamental shift in perspective: autism is presented not as a set of deficits but as a diverse profile of cognitive, communicative and sensory functioning that, in a suitably designed environment, can be associated with specific strengths. Professionals should recognise support needs, not to diagnose autism, but to design environments less reliant on formal disclosure – important because some students and staff do not disclose due to stigma or fear of unequal treatment. UDL, strengths-based role design and structured mentoring shift the focus from reactive adaptation of the individual to proactive design that considers different styles of learning, communicating and performing tasks from

the outset.

Module 2: transition from higher education to the labour market. It focuses on the transition of autistic graduates to employment, a sensitive stage because it changes how the person is expected to operate: university, despite its barriers, is generally more predictable than employment, with its informal relationships, unspoken norms, pressure to present oneself well and ambiguous expectations. Universities should act as intermediaries through structured career guidance, awareness of one's skills and strengths, work placements, collaboration with employers, workplace simulations, mentoring, job coaching and support in understanding organisational rules. The literature confirms that barriers are multi-dimensional – limited employer knowledge of autism, traditional recruitment, insufficient transition support – and that strategies must address both access to and retention of employment.

Module 3: inclusive learning and working environments. It focuses on designing conditions that facilitate participation. Consistent with person–environment fit, functioning depends not only on skills but on their fit with the environment: clear instructions, a predictable timetable, sensory accessibility, minimised overload, precise assessment criteria and consistent procedures. The environment is not neutral; it can enhance or hinder potential. These solutions benefit entire teams – clear communication, structured processes and transparent criteria improve performance – so neuro-inclusivity is also a tool for improving organisation and management.

Module 4: practical models for inclusive support. It presents practical models for inclusive support, moving from general statements to the mapping of specific processes. Perceptions of an institution are shaped by direct experience of its day-to-day operations – recruitment, classes, assessment, work placements, teamwork, feedback and promotion – and if these touchpoints are unclear, sensorily overwhelming or based on hidden expectations, they lead to exclusion despite

declared openness. The module proposes mapping the student and staff journey, identifying barriers, designing adjustments and building institutional accountability. Student Journey Mapping follows the experience from first contact to graduation and the transition into work, revealing risk points such as overwhelming induction days, unclear assessment criteria, unstructured group work, a lack of quiet spaces or unpredictable work placements.

Module 5: good practice in workplace organisations. It presents good practice in workplace organisations, treating neuro-inclusivity as a strategic, measurable and scalable dimension of talent management, process design and organisational quality rather than a symbol of social responsibility. Traditional employment systems prioritise eye contact, smooth self-presentation and social spontaneity, whereas in many roles accuracy, a systematic approach, pattern analysis, data work, adherence to procedures and concentration may matter more. Organisations should therefore move from general awareness to operational alignment: task analysis, job carving, task decomposition, competency mapping, sensory audits, structured onboarding, management training and systems for measuring effectiveness. The module proposes KPIs, dashboards, environmental, social and governance (ESG) criteria and social return on investment (SROI) as possible tools. SROI should only be reported if the authors specify the valuation method, counterfactual or deadweight assumptions, attribution, displacement, time horizon, discounting and sensitivity analysis; otherwise, it should be presented as a possible future method rather than a result.

7. Can be very useful to adopt the 5P model in workplaces, with some adaptation for a neuro-inclusive transition from higher education to the labour market. Based on the analysis of the In4Aut materials, a 5P model can be proposed, organising support for autistic people from education through to long-term labour market participation:

P1 – Understanding

The first stage is understanding the diverse cognitive, communicative, sensory and organisational profiles of autistic people – not diagnosing students or employees – including their strengths, work preferences, support needs and environmental barriers. In practice this means training academic and administrative staff, careers advisers, employers and managers; without it, inclusion remains superficial.

P2 – Design

The second stage is the proactive design of the environment: teaching, physical spaces, information, communication, assessment, work placements, recruitment and work organisation, guided by UDL, sensory accessibility, clear procedures, predictability and structured feedback. Institutions should not wait for individual requests for adjustments, but create solutions that are user-friendly for a diverse range of users from the outset – an approach that also anticipates the accessibility duties described above.

P3 – Preparation

The third stage prepares both autistic individuals and institutions. Students and graduates need support in self-awareness of skills and strengths, career planning, understanding organisational rules, interview preparation, professional communication and coping with change; universities and employers must prepare their procedures, staff and working environment. Preparation is two-way: one cannot expect an autistic person to enter the labour market successfully if the host organisation does not understand neuro-inclusive onboarding, communication and performance appraisal.

P4 – Transition

The fourth stage is the transition itself, which should be a continuous process rather than a one-off event: work placements, mentoring, job coaching, gradual onboarding, university–employer collaboration, support in the initial stages of

employment and ongoing feedback. Higher education institutions should become active players in the ecosystem of innovation and inclusion, bridging education, career guidance and work.

P5 – Measurement

The fifth stage measures the effectiveness of interventions; without evaluation, inclusion remains a declaration. Quantitative indicators include the number of staff trained, students supported, neurodivergent participants in work placements, time taken to implement adjustments, retention, absenteeism and promotions; qualitative indicators include psychological safety, satisfaction, sense of belonging, stress levels and assessments of communication and accessibility. Evaluation should be cyclical: data collection, interpretation, adjustment and re-measurement.

Stage	Lead actors	Core activities	Indicative resources	Example indicators
P1 Understanding	University inclusion/careers teams; HR; managers; autistic participants who choose to contribute	Map barriers and task/environment demands; offer staff learning; gather voluntary feedback without diagnosing	Training materials; journey-mapping template; paid or otherwise supported participation	Staff confidence/knowledge pre-post; barriers identified and prioritised; participant-reported relevance
P2 Design	Course leaders; accessibility and IT teams; recruitment and line managers	Redesign information, assessment, recruitment, onboarding and sensory conditions proactively	Accessibility checklist; clear-language templates; sensory audit; work-sample selection tools	Procedures revised; accessibility defects resolved; recruitment and course materials audited
P3 Preparation	Careers advisers; student; employer; mentor/job coach where appropriate	Co-create transition plan; clarify tasks, communication, preferences and support options	Individual transition plan; job analysis; mentor time; accessible interview materials	Plans completed by choice; agreed actions implemented; participant-rated preparedness
P4 Transition	Hiring manager; line manager; HR; careers service; job coach if used	Structured onboarding; named contact; regular check-ins; review adjustments with the employee	Protected manager time; onboarding schedule; written task guidance; adjustment budget	Time to agreed support; 3/6/12-month retention; employee-rated role clarity and support
P5 Measurement	Project evaluator; HR; university leads; autistic contributors	Establish baseline; track outputs, outcomes and employment quality; review and improve	Consented surveys; anonymised HR data; follow-up protocol; data-protection safeguards	Employment at 6/12 months; hours/pay and contract quality; job satisfaction, wellbeing and belonging

Source: Authors' own elaboration based on the proposed 5P neuro-inclusive transition framework and the documentary analysis of the In4Aut project results.

It is fundamental to consider a hypothetical graduate who has the required analytical skills but finds conventional, unstructured interviews and an informal first

week difficult. The example is illustrative, not a reported In4Aut participant case. Under P1, the careers adviser and employer map the actual job tasks, communication requirements and environmental barriers, asking the graduate what support they would find useful rather than inferring needs from a diagnosis. Under P2, the employer provides the interview questions or competency areas in advance where feasible, uses a job-relevant work sample, supplies written task instructions and checks sensory conditions. Under P3, the graduate and employer agree a transition plan, a named contact, feedback preferences and the timing of check-ins. Under P4, the manager uses a structured onboarding schedule and reviews whether the agreed arrangements work after two, six and twelve weeks. Under P5, the employer and graduate review role clarity, wellbeing, job satisfaction and whether the employment relationship continues at six and twelve months. The intervention is adapted to the individual and the role; it does not assume that all autistic people need the same measures or that the graduate must disclose a diagnosis to benefit from generally accessible practices.

Relationship to supported employment. The 5P framework is not a substitute for supported employment or individualised job coaching. Rather, it offers an institutional sequence that can encompass those approaches and connect them to university practices, employer-side job design and organisational evaluation. Supported employment typically concentrates on helping an individual obtain and maintain competitive employment through individualised support; the proposed framework places additional explicit emphasis on upstream institutional design, preparation of both sending and receiving organisations, and measurement of job quality and wellbeing. This is a conceptual distinction to be tested empirically, not evidence that the 5P framework produces better outcomes.

The portal requires separate implementation reporting before it can support claims about practical impact. The documents analysed here identify the portal as a project output, but the corpus available for this article does not provide sufficient

verifiable information on its public release status, complete feature set, accessibility testing, content governance, maintenance ownership or usage analytics. Accordingly, the portal is not treated here as an evaluated intervention. If the authors retain a substantive claim about the portal, they should document its live URL and release/version date, intended users, principal functions, accessibility standard and test process, data collected, responsible maintainer, update schedule and the way each function supports one or more 5P stages. Otherwise, claims should remain limited to its intended role as a support resource.

A law-and-economics perspective makes the organisational mechanisms explicit. Legal duties establish a minimum standard and can reduce uncertainty about required action, while enforcement risk, reputational incentives, staff time, recruitment costs, workplace redesign and the cost of specialist support affect implementation choices. For smaller organisations, a named internal lead, reusable accessible templates, staged implementation and collaboration with universities or employment services may reduce fixed costs; they do not remove legal obligations. Business cases should compare the costs of specific interventions with credible outcomes such as recruitment-process completion, avoidable turnover, job quality and employee wellbeing. They should not rely on an assumption that autistic employees are inherently more productive or that inclusion is justified only when it generates a financial return.

The current documentary analysis does not establish the extent to which autistic people contributed to the design, review or interpretation of the project outputs. This should be reported explicitly: who participated, in what capacity, at which stages, how their contributions affected decisions, and whether participation was accessible and appropriately compensated. If such involvement does not occur or cannot be documented, the limitation should be acknowledged and future co-design recommended. Where disability or health information is collected, organisations

should identify a lawful basis under the GDPR, assess whether special-category data are processed and which Article 9 condition applies, minimise collection, restrict access, define retention periods, provide clear notices and avoid using diagnosis as a proxy for competence. Evaluation should use aggregated or pseudonymised data wherever possible and should not make disclosure a condition of accessing generally available inclusive practices.

A feasible evaluation should use a prospective baseline and follow-up design, even if a randomized trial is not feasible. Before training or pilot participation, collect baseline measures of staff knowledge and confidence, existing accessibility and recruitment practices, and where participants freely consent/graduates' perceived preparedness, belonging and wellbeing. Repeat staff and practice measures immediately after training and at 6–12 months. For participating graduates, record employment status, time to first job, contract type, paid hours, pay where ethically and legally appropriate, role fit, access to agreed adjustments, job satisfaction and wellbeing at 3, 6 and 12 months after entry into employment. Report denominators, missing data, attrition and subgroup composition transparently. Where possible, compare change with a comparable cohort or staggered implementation group; without a credible comparator, report associations and feasibility rather than causal effects. Employment data should not be used as the sole measure of success, and retention should not be interpreted positively if the role is poor quality or wellbeing deteriorates.

Limitations. This article is based on project documentation and course materials rather than observed implementation or outcome data. The analysis is therefore subject to document availability, project-team framing and the absence of independent participant testimony in the corpus. The proposed framework has not yet been validated with autistic students, graduates, employers or independent evaluators, and the portal's technical and operational status cannot be assessed from

the available documents. The legal analysis is time-sensitive and should be checked against the consolidated legislation in force on the final submission date. These limitations mean that the article offers a theory-informed implementation framework and evaluation agenda, not proof of effectiveness.

In4Aut is an important attempt to translate neurodiversity, the social model of disability and inclusion into concrete educational and organisational tools. At the same time, its effectiveness depends on whether its outputs become lasting institutional change or remain educational materials: the literature shows that the main difficulty lies in the weak integration of tools into the day-to-day practices of universities, careers services and employers.³⁶

8. A university is not only a place for the transfer of knowledge but, for autistic students, a transitional environment between secondary school and work. Vincent (2020) points out that, despite the growing number of autistic people in higher education, their labour market outcomes remain among the poorest of disabled students and graduates, reflecting difficulties not only of formal access but of social mobility, accessible recruitment, material working conditions and the resources needed to retain employment.³⁷ Many inclusion projects stop at raising awareness. In4Aut goes further, proposing process mapping, sensory audits, UDL, mentoring, job coaching, job carving, task decomposition and measurable indicators, in line with Scott

³⁶ DAVIS, WATTS & LÓPEZ (2021). A systematic review of firsthand experiences and supports for students with autism spectrum disorder in higher education. *Research in Autism Spectrum Disorders*, 84, 101769. <https://doi.org/10.1016/j.rasd.2021.101769>; EZERINS, SIMON, VOGUS, GABRIEL, CALDERWOOD & ROSEN (2024). Autism and employment: A review of the “new frontier” of diversity research. *Journal of Management*, 50(3), 1102–1144. <https://doi.org/10.1177/01492063231193362>; SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>.

³⁷ VINCENT (2020). Employability for UK university students and graduates on the autism spectrum: Mobilities and materialities. *Scandinavian Journal of Disability Research*, 22(1), 12–24. <https://doi.org/10.16993/sjdr.656>.

and co-authors' finding that context-focused interventions are needed.³⁸

The critical question is who will be responsible for redesigning these processes; if it remains individual lecturers or 'inclusion enthusiasts', change will not be sustainable. Module 5 rightly emphasises indicators, ESG, SROI and dashboards, which move inclusion from goodwill to accountability. Excessive quantification should, however, be avoided: the number of staff trained does not mean changed teaching practice, nor does the number of people employed indicate quality of employment. Indicators should also capture autistic people's experiences, the quality of adjustments and sensory load; as Thorpe and co-authors show, traditional approaches shift the burden of retaining employment onto the employee and the need is to prioritise autistic voices.

In4Aut emphasises a competence-based approach – accuracy, concentration, logical thinking, pattern recognition and commitment to quality – as a counterbalance to deficit-based language, but positive stereotyping must be avoided. Bury, Hedley, Uljarević and Gal (2020) note that the evidence for the 'autism advantage' is mixed and does not justify a uniform profile of an 'autistic employee'.³⁹ Autistic people differ in support needs, cognitive profile, gender, experiences of stigma and willingness to disclose, so neuro-inclusive design must create procedures that recognise individual profiles rather than assign 'typical' roles.

Formal adjustments often require disclosure of a diagnosis, but many autistic people do not disclose for fear of stigmatisation, unequal treatment or excessive scrutiny. Module 1 rightly argues that professionals should identify support needs through observation, dialogue and accessible design. Romualdez, Walker and

³⁸ SCOTT, MILBOURN, FALKMER, BLACK, BÖLTE, HALLADAY, LERNER, TAYLOR & GIRDLER (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>.

³⁹ BURY, HEDLEY, ULJAREVIĆ & GAL (2020). The autism advantage at work: A critical and systematic review of current evidence. *Research in Developmental Disabilities*, 105, 103750. <https://doi.org/10.1016/j.ridd.2020.103750>.

Remington (2021) show that disclosure decisions depend on anticipated reactions, organisational culture and past experiences, and that autistic people worry more about how they will be treated after disclosure than about disclosure itself.⁴⁰

Inclusion cannot therefore rest solely on a ‘diagnosis – application – adjustment’ procedure, which is too reactive and excludes people who are undiagnosed, diagnosed late, masking or afraid to disclose; this is also the limit of legal frameworks that attach entitlements to certification. Universal design – clear instructions, predictable procedures, alternative forms of participation, calm spaces, written feedback and transparent criteria – should be the norm rather than an individual exception. The solutions proposed by In4Aut follow the direction indicated by the literature: from deficit to fit, from awareness to practice, from individual adjustments to environmental design, and in particular towards integrating higher education and the labour market. This is justified, as Hedley and co-authors (2017) showed that employment programmes for adults with ASD remain limited and the transition into employment insufficiently understood.

However, educational interventions may have limited impact without genuine change in employment practices. Employers may declare openness but still conduct interviews based on self-presentation, assess ‘cultural fit’ and read a different communication style as lack of competence. Day and co-authors (2025) found that, despite declared openness, the main barriers perceived by British employers are insufficient knowledge about autism and standard recruitment methods.⁴¹ We must ask to what extent autistic people are co-creators, rather than merely recipients, of solutions. Following ‘nothing about us without us’, Thorpe and co-authors (2024) note that research has too often relied on non-autistic perspectives, whereas autistic

⁴⁰ ROMUALDEZ, WALKER & REMINGTON (2021). Autistic adults’ experiences of diagnostic disclosure in the workplace: Decision-making and factors associated with outcomes. *Autism & Developmental Language Impairments*, 6. <https://doi.org/10.1177/23969415211022955>.

⁴¹ DAY, WOOD, CORKER & FREETH (2025). Understanding the barriers to hiring autistic people as perceived by employers in the United Kingdom. *Autism*. <https://doi.org/10.1177/13623613241301493>.

people's own experiences reveal which elements of the work environment are genuinely supportive.⁴² Participatory involvement should be a quality criterion for In4Aut: autistic people should help assess course materials, test the toolkit, design the pilot and interpret evaluation results. The expected results (a course, 25 trained researchers, trainers and teachers, and 60 pilot students) are important but preliminary: they do not show whether the project improves the transition into work or merely increases participants' knowledge. The greatest risk is a university preparing students for a labour market that remains unchanged. A long-term evaluation should cover staff knowledge, attitudes, teaching and organisational practices, students' experiences and employment outcomes; Ezerins and co-authors (2024) note that barriers arise at every stage from recruitment to career development. The evaluation should combine output indicators (modules, people trained, pilot students), outcome indicators (changes in staff skills, modified syllabuses, accessibility procedures, employers adopting inclusive recruitment) and impact indicators (retention in education, work placements, labour market entry, quality and retention of employment, wellbeing and belonging).

9. The 5P model combines the cognitive, organisational, educational, transitional and evaluative dimensions of In4Aut and shows that inclusion is a process rather than a single action. It nevertheless requires operationalisation into procedures, responsibilities, resources and indicators: 'understanding' cannot mean one-off training, 'design' a general call for accessibility, 'preparation' concern students alone, 'transition' end with career guidance, or 'measurement' be reduced to participant numbers. Lindsay and co-authors (2018) stress that organisational benefits are not

⁴² THORPE, MCKINLAY, RICHARDS, SANG & STEWART (2024). The lived experience of autistic adults in employment: A systematic search and synthesis. *Autism in Adulthood*, 6(3), 286–298. <https://doi.org/10.1089/aut.2022.0114>.

automatic but depend on the type of work, support, policies and management.⁴³ The sustainability of the In4Aut outputs will thus depend on the institutionalisation of the course within educational programmes, genuine employer commitment and systematic evaluation of students' and graduates' experiences. In4Aut is consistent with key trends in the literature and the regulatory environment: a move from the deficit model to environmental design, a strengths-based approach, accessible processes, and collaboration between higher education institutions and employers. At the same time, the greatest risks are reducing inclusion to one-off training, positive stereotyping, excessive focus on output indicators, lack of lasting change in recruitment practices and insufficient inclusion of autistic voices. In4Aut must be developed as a process of institutional change, not merely a set of project outputs.

The analysis of In4Aut leads to the following conclusions:

- Effective inclusion requires a move away from the deficit model: autism is a diverse profile of functioning that, under the right conditions, can be associated with significant potential.

- Universities should bridge education and employment, and employers should move from awareness to the practical design of neuro-inclusive work environments.

- The evolving legal framework (accessibility requirements, Italian disability reform, AI Act) increases pressure to move from reactive adjustments to universal design, but does not replace it.

- The In4Aut materials provide a basis for a proposed integrated educational and organisational intervention, while the 5P framework remains to be validated through implementation and longitudinal evaluation.

Several practical implications follow. First, universities should incorporate neurodiversity into curricula beyond education, psychology and social sciences – into

⁴³ LINDSAY, CAGLIOSTRO, ALBARICO, MORTAJI & KARON (2018). A systematic review of the benefits of hiring people with disabilities. *Journal of Occupational Rehabilitation*, 28, 634–655. <https://doi.org/10.1007/s10926-018-9756-z>.

management, administration, security, IT and other fields. Second, careers services should develop specialist guidance for neurodivergent students, including strengths, sensory preferences, disclosure strategies and reasonable adjustments. Third, employers should reform recruitment: work samples, practical tasks, questions provided in advance, clear criteria, written responses, low-sensory-load interviews, and human-supervised, audited use of any automated screening tools in line with the AI Act. Fourth, inclusion should be assessed as a quality of the environment, not a personal trait.