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Measuring contract transparency: from legal reasoning to LLM-based assessment. An italian law perspective

Misurare la trasparenza contrattuale: dal ragionamento giuridico all'impiego dei modelli linguistici. Una prospettiva di diritto italiano

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Abstract

Contract Transparency is widely recognised as a fundamental safeguard for individual self-determination. However, its inherent indeterminacy often undermines its practical effectiveness. This paper explores the possibility of translating qualitative transparency requirements into measurable and computable parameters in order to enhance the consistency, predictability, and legal certainty of the transparency assessments. Starting from a reconstruction of the legal meaning and function of transparency in contract law, with particular attention to Italian consumer and banking contract law, the article analyzes the logical-legal steps underlying the transparency assessment as a distinct interpretative operation for exploring both its measurability and its potential computational implementation. On this basis, the article discusses the extent to which the transparency assessment may be operationalized for LLM-based applications in support of judicial decision-making within the framework of human–AI collaboration.

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Abstract
La trasparenza contrattuale è ampiamente riconosciuta come una tutela fondamentale per l'autodeterminazione individuale. Tuttavia, la sua intrinseca indeterminatezza ne mina spesso l'effettività. L'articolo esplora la possibilità di tradurre i requisiti qualitativi della trasparenza in parametri misurabili e computabili, al fine di accrescerne la coerenza, la prevedibilità e la certezza del diritto nelle valutazioni della trasparenza. A partire da una ricostruzione del significato giuridico e della funzione della trasparenza nel diritto dei contratti – con particolare attenzione alla normativa italiana in materia di contratti bancari e dei consumatori – l'articolo esamina i passaggi logico-giuridici alla base della valutazione della trasparenza come autonoma operazione interpretative, per esplorarne sia la misurabilità, sia la potenziale attuazione computazionale. Su queste basi, l'articolo discute la misura in cui il giudizio di trasparenza possa essere reso operativo per applicazioni basate su LLM a supporto della decisione giudiziale nell'ambito di una collaborazione uomo-IA.

Keywords: transparency; consumer credit contracts; contract transparency assessment; measurement; judicial decision; augmented justice

Summary: 1. Introduction. Dimensions of Transparency: Legal Norms and Language. – 2. Assessing Contract Transparency in Judicial Reasoning. – 3. Transparency in Action: Consumer Credit Agreements and the Judge Discretion. – 4. Conclusion. Measuring Contract Transparency: Computational Approaches and the Role of LLMs in Supporting Transparency Assessment.

1. Introduction. Dimensions of Transparency: Legal Norms and Language.

Transparency, as a legal norm, is widespread in contemporary law, taking on a variety of meanings. In the Italian legal system, it is required of public bodies and institutions in terms of openness and accessibility (right of access to documents);[1] in certain sectors, it specifies more general obligations related to the disclosure of information by entities towards clients, potential clients and markets[2].

Furthermore, transparency concerns acts and relations between individuals, such as in asymmetrical contracts, where a legal obligation to disclose certain information is provided for in terms of minimum content or formal requirements to achieve clarity, comprehensibility, and at times, conciseness.[3]

[1] In the Italian legal system, transparency in administrative law (Article 97 of the Italian Constitution) concerns the obligations of transparency regarding the public disclosure and dissemination of administrative acts, documents, information and data by public administrations (Legislative Decree No. 33 of 14 March 2013 and subsequent amendments), as well as the right of each individual to know precisely the content of the actions of public administrations (Law No. 241 of 7 August 1990 and subsequent amendments).

[2] An exemplary sector is banking, where the notion of transparency has broad application, referring both to information on the institution and its activities, and to features relating to the contractual relationship with the customer (*disclosure* obligations, institution governance rules and product control, supervisory powers of administrative authorities to protect the customer and the market, and customer information on banking services and operations). More recently, the impact of decision-making algorithms on banking has also emerged: see A Davola, *Algoritmi decisionali e trasparenza bancaria* (Utet 2020).

[3] The word "transparency" is expressly mentioned in some legislative texts (e.g., Articles 5(1)(a) and 12(1) of the GDPR) and in the recitals of EU legislation (*e.g.,* Directive 2008/48/EC), as well as in the Italian

Moreover, a legal obligation of transparency, regarding the content and means of information, is owed by data controllers when informing natural persons. [4] Lastly, it represents an ethical and legal requirement in developing technologies and Artificial Intelligence, encompassing the right to meaningful information and an *ex post* algorithmic explanation in the event of an AI decision not mediated by human evaluation (automated decision-making). [5]

In such a scenario, some scholars have argued that dealing with transparency in legal terms could be 'a scientifically unreliable and practically fruitless operation'. [6] Moreover, through the figurative use of the term 'transparency' in legal language, the notion has become homogeneously perceived in its axiological meaning, and for that reason, insidious. Like all legal metaphors, this figurative meaning bypasses the rational control. The comprehension of the concept is drawn to its meaning in general language and risks inducing the exchange of the figurative sense for (legal) reality.[7]

Therefore, if one refers to the meaning of an absence of any obscurity or intermediation in human cognition and, thus, to the values of certainty, truth, and rational knowledge and choice, transparency could be perceived in the legal domain as a safeguard and an instrument enabling fundamental values and rights, such as the protection of public interests, the competitive market, and the self-determination of the individual, regardless of any precise evaluations on its efficacy and effectiveness. [8] However, the concept of transparency is inherently indeterminate and its perception as a guarantee is misleading.

The content of what is regarded as "transparent information" remains uncertain. In private law, where information serves to enable self-determination, a mere standardized list of information, usually provided by law, might not even be read or understood by the relevant recipient, considering

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Consolidated Banking Act (Testo Unico Bancario - TUB), Title VI. The word transparency appears again in the Italian Consumer Code both as a general normative value [Art. 2(2)(e)] and as a set of more specific requirements concerning clarity and comprehensibility (Art. 35), whose concrete content is shaped by judicial interpretation and legal scholarship.

[4] The distinction between an act and an activity, due to the different interests to be protected, entails different rules and controls, which have been explored in more depth in private law literature. See P Spada, *La tipicità delle società* (CEDAM 1974).

[5] On the relevant rules of the GDPR, a comprehensive review on the point is in E Troisi, 'Algorithmic Decision, Black-box and Ethical AI: The Right of Access as the Right to Obtain an Explanation' [2022] Jus Civ. 953 - 975. In the AI Act, transparency obligations are required at different levels: providers of high-risk AI systems (e.g., recruitment software, credit scoring) must provide deployers with instructions for use and technical interpretability (Art. 13) and natural persons have the right to an explanation of individual decisions made by deployers via high-risk systems (Art. 86); providers and deployers of limited-risk and generative AI systems (e.g., chatbots, image generators, deepfakes) must disclose AI interaction to end-users and apply watermarking to synthetic content (Art. 50); providers of general-purpose AI (GPAI) models must publish a summary of training data for copyright compliance (Art. 53).

[6] The quotation, referring only to the transparency of contracts, is from G Alpa, 'Note minime sulla trasparenza dei contratti bancari e finanziari' in P Ferro Luzzi and G Castaldi (eds), *La nuova legge bancaria. Il T.U. delle leggi sull'intermediazione bancaria e creditizia e le disposizioni di attuazione. Commentario,* III (Giuffrè 1996), 1783, already taken up by S Pagliantini, 'Trasparenza contrattuale', *Enciclopedia del diritto Annali V* (2012) 1280 ff.

[7] See F Galgano, *Le insidie del linguaggio giuridico. Saggio sulle metafore del diritto* (Il Mulino 2010).

[8] For a radical critique of the society of transparency (as an instrument of surveillance), see B-C Han, *La società della trasparenza,* trans. F Buongiorno (Nottetempo 2014), who interprets transparency as a false ideal.

the well-known limitations of rationality, cognitive biases, heuristics, and the risks of cognitive overload for the information recipient.[9]

In the more specific realm of data protection, for instance, where there is a requirement for the controller to inform 'in a concise, transparent, intelligible, and easily accessible manner, in simple and clear language,' even a compliant privacy notice may not be able to directly guide the decision, *i.e.,* informational self-determination due to the complexity of the domain itself to be understood. Instead, it primarily serves as an instrument for *ex post* control.[10]

In the context of asymmetrical bargaining, rules of informational transparency intended to address information asymmetry may not only fail to solve the contractual imbalance, but risk merely shifting responsibility onto the recipient of the information (the weaker party), who, having been informed, is deemed to have effectively chosen.[11] They are also ineffective if they are viewed solely as affecting the professional's conduct in the pre-negotiation phase, since they would be protected exclusively through the remedy of damage compensation and would load the claimant with a heavy burden of proof.

However, one must consider that within asymmetrical negotiations, transparency assures a certain degree of protection to the weaker party to the contract,[12] as demonstrated by the increase in judicial and extrajudicial litigation on the transparency of contracts.[13] Nevertheless, the emerging litigation and the sanctions of professionals' opportunistic behavior still reveal a lack of defined indexes of transparency.

This article aims to investigate this question, namely the conditions under which a contract may be considered transparent, by analysing the stages of the

[9] L Gatt, R Montanari and IA Caggiano, 'Consenso al trattamento dei dati personali e analisi giuridico – comportamentale. Spunti di riflessione sull'effettività della tutela dei dati personali' [2017] Politica del diritto, 39 ff.

[10] See IA Caggiano, 'Il consenso al trattamento dei dati personali nel nuovo Regolamento europeo. Analisi giuridica e studi comportamentali' [2018] ODCC, 67-104, esp. 89.

[11] See A Barenghi, 'Appunti sulla trasparenza bancaria, venticinque anni dopo' [2017] Questione Giustizia (online journal).

[12] The protection of the weaker party through transparency can be understood in multiple ways. First, transparency operates as a criterion for choosing among possible interpretations of the contractual text (rather than as a remedy in the strict sense): in cases of doubt, ambiguous terms must be interpreted in the way most favourable to the consumer, pursuant to Article 35 of the Consumer Code and Article 1375 of the Civil Code. Secondly, transparency also plays a role in the assessment of unfair terms. Where contractual terms concern the subject matter of the contract or the adequacy of the price, the sanction of nullity provided for by Article 34(2) of the Italian Consumer Code may apply if such terms have not been drafted in clear and intelligible language. This sanction therefore represents a further stage in the assessment of unfairness. Thirdly, where contractual terms are not comprehensible to a person of average ability and intelligence, they cannot produce effects against the consumer, who is nevertheless required to exercise ordinary diligence in becoming aware of their content (by analogy with Article 1341 of the Civil Code). Finally, an absolutely incomprehensible clause is void for lack of determinacy of the object. On this point, CM Bianca, 'Il Contratto', *Diritto civile III* (Giuffrè 2019) 356 ff.

[13] One thinks, for example, once again of the banking sector and the operation of out-of-court dispute resolution bodies such as the Banking and Financial Arbitrator (ABF), which have made it possible for previously hidden litigation to emerge due to the modest value of the dispute, in which the issue of transparency (of contractual terms and conditions) is central. See the report on the activities of the ABF in 2022 (data for 2021 and the first months of 2022). In general on this subject, A Barenghi, *Consumer Law* (2nd edn, Wolters Kluwer 2020) 466 ff.

interpretative assessment (hermeneutical judgement) of transparency and the application of logical and linguistic criteria in contract interpretation.[14-15]

Secondly, it explores the potential role of technologies and methodologies, such as Artificial Intelligence and LLMs, in this interpretative process from the perspective of the judicial decision-making. Far from implying the complete automation of judicial reasoning, this perspective encourages a reconsideration of the human cognitive processes underlying judicial assessments.[16]

To develop this twofold objective, the paper is structured in three main sections. After reconstructing the legal framework of contract transparency under Italian law, the analysis turns to its judicial assessment in practice, with particular attention to consumer credit agreements as a field where the evaluation of comprehensibility and the protection of vulnerable parties have become particularly significant. The final part explores the possibility of translating transparency requirements into measurable parameters, investigating how technological tools and artificial intelligence may contribute to a computational assessment of contract transparency while preserving the normative and contextual dimension of judicial reasoning.

2. Assessing Contract Transparency in Judicial Reasoning.

When assessing the transparency of a contractual text, especially in the context of an asymmetrical business-to-consumer contract, the interpreter (*e.g.*, a judge, but also a party to the contract) must evaluate the *quality of the text* in terms of clarity, comprehensibility and accessibility to the weaker party. This involves determining whether the text has been written clearly and comprehensibly (as outlined in Article 35 (1) of the Italian Consumer Code, which refers to the *clarity and comprehensibility* of the contractual text),[17] according to the social sphere where statements are made, *i.e.* for the group of customers for whom the contract is intended (the average consumer).[18] In credit contracts, it must also be assessed also whether specific relevant information has been provided in a concise manner (*e.g.,* as specified in Article 125 *bis* of the Italian Banking Act - TUB).[19] In banking contracts, some specific

[14] J Nieva-Fenoll, *Intelligenza artificiale e processo* (Giappichelli 2018) and A Guarapon and J Lassègue, *La giustizia digitale* (Il Mulino 2021).

[15] This aspect specifies the characterisation of law as a cultural subsystem, which manifests itself through language (and social practice), on this point, commenting on Falzea's thought, P Sirena, 'Teoria dell'efficacia giuridica nel pensiero di Angelo Falzea' [2017] Riv. dir. civ., 999 ff.

[16] M Frixione, *Come ragioniamo* (Editori Laterza 2021), which enucleates decision-making among the cognitive processes, in addition to inferences and *problem solving*, all of which converge in the judge's interpretative and decision-making process.

[17] S Martuccelli, 'Il canone dell'interpretazione più favorevole al consumatore' in Aa. Vv., *Studi in onore di Giuseppe Benedetti* (2008) 1015 ff., esp. 1024.

[18] With regard to boilerplate clauses, addressed to an indistinct class of contracting parties, the yardstick for assessing comprehensibility is the average consumer*, i.e.*, an abstract and general parameter not referring to particular semantic capacities, see Martuccelli (n 17) 1025 ff. Even in the case of banking contracts, for which the transparency regulations (Bank of Italy Transparency Provisions, para. 12 *General Principles*) lay down differentiated modalities in relation to the different customer groups and the characteristics of the services, personalised contractual information has not been achieved. On this subject, in a critical sense, AA Dolmetta, *Trasparenza dei prodotti bancari. Rules* (Zanichelli 2014) 88 ff.

[19] On the safeguards protecting this notion of transparency, see *supra* n 12.

canons of clarity and comprehensibility are provided, though limited to the stage prior to the conclusion of the contract (e.g. graphic highlighting using a representative example, Art. 123 TUB).

The transparency assessment is a hermeneutic process which constitutes a distinct evaluative step within the legal interpretation of the contract. While legal interpretation *stricto sensu* aims to identify the legal meaning and ascertain the substantive content of the parties' rights and obligations - also considering the parties' bahaviour following the signing of the contract - the transparency assessment is focused only on the contractual text on the way in which contractual terms are formulated and presented (art. 35 Cons. Code), in light of protecting the weaker party. A finding of non-transparency may, moreover, trigger specific legal remedies provided by law and distinct from those provided for by the rules of interpretation: interpretation in favour of the consumer as *per* Art. 35 (1) of the Italian Consumer Code, or nullity under Art. 34 of the same Act when the ambiguity refers to the object of the contract and adequacy of the consideration.[20]

However, these two processes remain closely interconnected, as they both refer to the meaning of the contract in order to ascertain its content or qualify it.

Transparency of contractual content implies that relevant information is presented to ensure completeness and an adequate understanding of the consequences arising from the agreement (*comprehension*). Moreover, the evaluation of transparency requires considering the legal canons set out in Italian law in Articles 1362–1366 of the Civil Code on contractual interpretation, which also provide a framework for assessing transparency, where compatible,[21] as far as they are applicable to consumers as well.

According to the prevailing view among legal scholars, contract interpretation constitutes a factual judgment,[22] namely an assessment on the merits rather than a review of legality. It involves the application of legal rules,

[20] On the relation between Art. 35 (1) and 35 (2) of the Italian Consumer Code and Art. 1370 of the Civil Code, see Martuccelli (n 17) 1050 ff.

[21] Under Italian law, the contract interpretation criteria are deemed to be structured into three distinct groups, hierarchically structured, from Articles 1362 to 1371 of the Italian Civil Code. The first group comprises criteria for subjective interpretation (the common intent of the parties): Article 1362 (Intenzione dei contraenti), Article 1363 (Interpretazione complessiva delle clausole), Article 1364 (Espressioni generali), and Article 1365 (Indicazioni esemplificative). Article 1366 (Interpretazione di buona fede) dictates that all contracts must be interpreted in accordance with the principle of good faith. Criteria for objective interpretation are aimed at resolving ambiguity via Article 1367 (Conservazione del contratto), Article 1368 (Pratiche generali di interpretazione), Article 1369 (Espressioni con più sensi), Article 1370 (Interpretazione contro l'autore della clausola), and Article 1371 (Regole finali). As for the hierarchical structure of these interpretative criteria, in line with the theory of Grassetti see N. Irti, *Testo e contest* (Padova 1996). Whatever position is taken regarding the relationship between the subjective and objective criteria of interpretation, this article argues that the first set of criteria, together with the principle of interpretation in accordance with good faith, should also be taken into account for the purposes of assessing contractual transparency. They form part of the interpretative framework that the consumer or other weaker contracting party is expected to employ in understanding the contractual text. By contrast, recourse to the objective criteria of interpretation presupposes ambiguity or opacity of the contract. From the perspective advanced in this article, they apply only when the meaning of the contractual term remains unclear through the ordinary interpretative tools available to the average addressee. This conclusion is consistent with the wording of the relevant provisions, which make the objective criteria applicable only where there is uncertainty or ambiguity in the understanding of the contract (*i.e.*, lack of transparency). Such uncertainty presupposes already a finding of non - transparency.

[22] See, albeit critically, V Calderai, *Interpretazione del contratto e argomentazione giuridica* (Giappichelli 2008).

linguistic criteria, technical knowledge and rules of experience, as also recognised within the legal framewrok.[23] This is true also for the assessment of transparency.

From this perspective, the transparency assessment may be viewed as a syllogistic judgment embedded in the polysyllogistic structure of contract interpretation.[24] Indeed, linguistic rules, rules of experience, and hermeneutic canons provided by law constitute major premises of instrumental inferences, as they fix the case in a preparatory function for the final step of ascribing the fact to the norm.[25]

The first level of the syllogism implies knowledge and application of linguistic rules and semantic codes. Regarding the relationship between the professional and the average consumer, they include primary codes, *i.e.*, the linguistic usages current in the entire linguistic community at a given time, and possible sub-codes.

It has been emphasized that literal meaning, as a methodological canon, is inherently a guarantee of meaning: it implies a finite number of meanings, and language, as a formal system of meaning, constitutes an insurmountable domain, the logical limit of meaning and the condition of its predictability and verifiability.[26] However, in the transparency assessment to verify clarity and comprehensibility, as it is in the interpretive judgment for the choice between meanings, it involves the construction of a network of meanings within the entire contractual text, syntactic constructs, and an internal logic. It requires identifying the cognitive horizon of the average consumer in order to assess whether the contractual terms are *comprehensible*, ambiguous, or unclear, and whether they enable the consumer to understand the legal *consequences* of the contract.

In this regard, it could be said that the interpreter operates using his/her own ability to understand within this complex network the common meaning and the interpretation(s) closest to the average consumer[27] under given external conditions.

Yet, neither from the point of view of language nor from that of expression, are there rules of linguistic clarity that professionals are obliged to follow when contracting with the consumer. Indeed, one must also consider that in some sector regulations (in particular, in the instructions of the Authorities, such as the banking sector) one can find drafting indications, which constitute linguistic, typographic, lexical, and syntactical guidelines, relevant at the industry level, and capable of affecting the conformation of contracts. [28]

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[23] C Grassetti, *L'interpretazione del negozio giuridico* (CEDAM 1983) speaks more properly of a logical-legal procedure, not of a pure factual judgement.

[24] Calderai (n 22) 93.

[25] Calderai (n 22) 435.

[26] M Orlandi, *Introduzione alla logica giuridica* (Mulino 2021), 95, where a «sistema formale di senso […] costituisce un dominio invalicabile, limite logico del significato e condizione di prevedibilità e verificabilità dello stesso».

[27] On the bounded rationality of consumers, a factor increasingly taken into account in judicial reasoning: see Council of State 10/10/22 no. 8650, in *Onelegale* database. In the literature, A Zoppini, 'Contratto ed economia comportamentale', *Enc. giur. tematici* I *Contratto* (2021) 313 ff. On biases in legal reasoning, L Calcagno, G Grassi, G Positano (eds.), *Psicologia del giudicare, Quaderno 32 SSM* (2024) 124 ff.

[28] See Transparency provisions applying to banking operators, Bank of Italy, *Trasparenza delle operazioni e dei servizi bancari e finanziari. Correttezza delle relazioni tra intermediari e client*, 19 March 2019. *In* particular, Annex 1 of the Provisions provides a guide with the main drafting guidelines that intermediaries can apply

Moreover, there are uniform standards that aim to provide criteria for clear writing translated into shared recommendations, such as the necessity of planning the text before writing, choosing familiar and concrete words, constructing syntactically linear sentences, and adopting precise strategies for the visual organization of information.[29] However, none of them is focused on contractual language. Both the guidelines and the standards traces back to the plain language technical approach, which is rooted in psycholinguistic studies and considers three levels (wording, structure, and design) to define the clarity of information.[30]

While not binding on the interpreter, these guidelines can help ascertain the perspective of the search for transparency, along with the relevant studies on professional and specialized language.[31]

3. Transparency in Action: Consumer Credit Agreements and the Judge Discretion.

Banking contracts contain terms and conditions (boilerplate clauses) regarding applied costs, synthetic cost indices, rules of the contract, and reimbursement mechanisms limited to only some of the costs and commissions, such as in the case of early repayment. To make an informed choice, consumers should understand both the economic content as well as the contractual legal rules. The judge (or interpreter), through an *ex post* prognostic assessment, must determine whether the consumer, based on the average consumer parameter, has been placed in a condition to understand the contract terms.

If we look at some of the controversial cases that have attracted attention at the national and European levels, we can highlight how the opacity of clauses is assessed on the basis of specific criteria. These criteria consider the complexity of the economic transaction as a whole (and consequently, the complexity of the notions to be understood), the connections between meanings within the entire contractual text (and thus, the connections between different clauses), and a common sense test.

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in their disclosures, such as, e.g.: the use of different font styles to highlight information; the use of bulleted lists and tables; the structure of documents to facilitate comparison; and verb forms and the most comprehensible pronominal usage.

[29] The relevant standards are UNI ISO 24495-1:2024 and the more recent ISO 24495-2:2025. While UNI ISO 24495-1:2024 is a general and universal document, intended for standard printed or digital texts aimed at a broad audience, ISO 24495-2:2025 specifically addresses the ecosystem of legal communication. According to the latter, legal documents must tackle a dual challenge: maintaining the utmost technical accuracy required by law while simultaneously being understood by citizens or managers who lack specific legal training. To achieve this, the second part introduces tools, such as collaborative writing processes from the very first drafts involving legal professionals and experts in legal design.

[30] On the Plain language movement, JC Redish, 'The Plain English Movement', in S Greenbaum (ed.), *The English Language Today* (Pergamon Press 1985) 125-138; D Fortis, 'Il plain language quando le istituzioni si fanno capire' *I Quaderni del MdS* (2003) available at <https://www.mestierediscrivere.com>. In Italy, rules of plain language were proposed for public administration see Presidenza del Consiglio dei Ministri – Dipartimento della funzione pubblica, *Codice di stile delle comunicazioni scritte pubbliche ad uso delle amministrazioni pubbliche* (Roma 1994).

[31] G Acerboni, A Panunzi, 'La scrittura professionale' in B. Baldi (ed.), *Comunicare ad arte*, Bologna (Zanichelli 2020) 221 ff., where the authors argue for the necessity that specialized writing comply with rules such as the standard UNI ISO 24495-1.

If one takes as an example the case of real estate loans indexed in foreign currencies, as emerged in ECJ and national case law, he/she will find compounding mechanisms for calculating the interest due. In a number of disputed domestic cases, the contract also contained a translation error related to early repayment.[32] In any case, the contract allowed the borrower to repay the mortgage early, stating that the principal to be repaid and any arrears were first calculated in Swiss Francs (CHF) using the contractually fixed exchange rate, and then converted back into Euros (EUR) based on the current market exchange rate on the day of repayment.

Authorities (judicial, administrative, and extrajudicial) have deemed the clause obscure, empolying a reasoning that can be traced back to the divergence between the common sense of the transaction and the text, even formally and grammatically intelligible, in the context of a complex transaction. To this extent, the Courts have repeatedly stated that financial institution must provide the borrower with sufficient information, including, where appropriate, simulations or concrete calculation examples of the risk, or that information relating to the past performance of the index on the basis of which the calculation is made, as well as simulations illustrating scenarios of fluctuation and the corresponding financial impact. [33]

On the other hand, in litigation concerning the reduction of costs incurred in connection with credit agreements due to early termination, which has recently drawn the attention of the Constitutional Court, [34] a focus on contractual transparency emerged. The question, as far as it concerned transparency, related to the content of specific clauses describing pre-contractual activities and, in particular, whether in each of these terms the words used exactly and clearly referred to activities prior to the conclusion of the contract, or if they were unclear and implied also activities subsequent to the conclusion of the contract (as is evident in expressions such as "management activities", "postage", "documentation"). In the second case, where words used were not homogeneous with the rest of the clause's text, its heading, and its regulation, the clause was considered opaque, leading to the application of the more favorable rules (those relating to executive activities), i.e. the mandatory rules.

[32] An exhaustive reconstruction of the cases is in Dolmetta and Lentini (n 18) 1 ff.

[33] See, Case C-125/18 (§51) *Marc Gómez del Moral Guasch* v *Bankia SA* EU:C:2019:695, available at <https://curia.europa.eu> followed by the national case law, cited below. See also, Case C-26/13 *Árpád Kásler, Hajnalka Káslerné Rábai* v *OTP Jelzálogbank Zrt* EU:C:2014:282; Case C-51/17 *OTP Bank Nyrt., OTP Faktoring Követeléskezelő Zrt.* v *Teréz Ilyés, Emil Kiss* EU:C:2018:750; Case C-448/17 *Árpád Kásler, Hajnalka Káslerné Rábai* v *OTP Jelzálogbank Zrt* EU:C:2014:282; Cass. civ, Sec. I, Judgment, 31/08/2021, no. 23655 in Onelegale database; Arbitro Bancario Finanziario, Collegio di Coordinamento, decision no. 5866/2015; AGCM, decision no. 27214/2018, in Bulletin no. 26 of 9 July 2018; *contra* Tribunale di Roma, judgment 21 January 2019, in <www.expartecreditoris.it>. Following the precedents of the Court of Justice of the European Union, the Courts have stated that contractual transparency in foreign currency mortgages must go beyond mere grammatical clarity to ensure that the average consumer can fully comprehend the concrete economic mechanism and evaluate the financial consequences of exchange rate risks on their total debt. Consequently, financial institutions are legally required to provide comprehensive pre-contractual information so that borrowers can make prudent, well-informed decisions. Ultimately, any obscure clauses regarding the main subject matter, such as currency conversion, that create a significant imbalance to the consumer's detriment can be deemed unfair and declared completely null and void.

[34] Constitutional Court, Judgement No. 263 of 22/12/2022, in www.cortecostituzionale.it.

The extensive litigation concerning these cases revealed the opportunistic behavior of professionals in unclearly classifying the relevant clauses.[35]

As anticipated, the current analysis focuses on the transparency assessment of term wording and its meanings.

4. Conclusion. Measuring Contract Transparency: Computational Approaches and the Role of LLMs in Supporting Transparency Assessment.

Once the concept of transparency has been specified, a further question may arise: whether transparency can be measured, *i.e.*, assessed through quantitative parameters. The issue is not merely a methodological one. Translating the factors and criteria that underlie assessments of transparency into quantitative indexes may help provide a more structured framework for judicial evaluation, thereby enhancing the consistency and predictability of judicial decisions and deflating litigation.

Moreover, translating the transparency assessment into measurable parameters opens up a broader inquiry into the computability of transparency. To the extent that the relevant elements of the judgment can be formalised, technological tools – including Artificial Intelligence – may contribute to supporting, modelling, or partially reproducing some aspects of the transparency assessment.

Considering the logical steps of the transparency assessment, the development of studies on plain language, and the examples taken from European and national judgments, measurable parameters of transparency may be evaluated, starting from legal canons which lay down literal and contextual interpretation, as well as common rules for general expressions and examples. These parameters for measuring can be derived from different levels:

- textual linguistics, which provides criteria for analyzing a text as a whole, in terms of its communicative function and acceptability for the addressee, its internal coherence, cohesion, and architecture of information (*e.g.*, through the theme – rheme progression) taking into account the context in which it is produced;
- specialized language lexicon and morphosyntax[36]

[35] Constitutional Court, Judgement No. 263/22: '*Faced with the distinction between up-front costs, which are non-recoverable, and recurring costs, which can be reduced, in reality abusive conduct emerged in the qualification and allocation of costs; the ABF reacted to this - in its decisions - by providing that, in the face of non-transparent conduct, all costs whose reasons had been opaquely manifested should be deemed reimbursable when the contractual conditions were drawn up*' (translation is ours).

[36] Acerboni and Panunzi (n 31) 233 ss. In the medical domain, for a complete framework for medical language as specialistized language, L Moro, 'Accessibilità e semplificazione linguistica nei testi di ambito medico ad uso del paziente: un esempio di buona pratica' (thesis, Università Ca' Foscari, 2018) 27 ff.; S Rinnone, 'Analisi della leggibilità dei consensi informati: un approccio linguistico-computazionale' (thesis, Università di Pisa, 2016) 1- 124.

- the plain language approach, which has developed indexes in general and specific sectors in continuity with textual linguistics[37] and has been developed, although on a general level, in standards,

- the applied psycholinguistics level;

- the presence of examples, to clarify the content and subject matter of the contract (*e.g.*, its economic value and consequences); the coherence between the meaning of individual words and the context of the clauses or terms where they are inserted;

All these rules should be considered in the assessment process in light of enabling the consumer to make an informed decision and considering inferential and predictive models.

By mapping the relevant elements in the transparency assessment, it becomes possible to model the algorithmisation of certain activities, aiming at increasing the certainty and celerity of the judgement as well as reducing litigation. Algorithmising the transparency assessment does not imply the complete reproduction of judicial reasoning within an artificial environment. Rather, it requires the identification and formalisation of the relevant parameters underlying the transparency assessment, to make them computable and measurable. The outcomes produced by computational models, including LLM-based systems, must then be empirically evaluated in light of legal standards and judicial reasoning.

As we have seen, the interpretative activity on contractual transparency may entail the identification of 'idiosyncratic' meanings within lists of words in terms regulating specific types of activity (to be concluded before the signing of the contract), or a more complex work of interpretation that relates to the understanding of the text, taking into account the description of a complex activity, the connections between the various phases of the contractual relationship, and the identification of the unclear meaning in this context.

At present, the prospect of the computability of the transparency judgement still appears to be in a development phase but can be approached in light of currently existing technologies.

The measuring task can be conducted in different ways: using purely quantitative software capable of verifying the degree of readability of a text according to different social and cultural groups (readability indices); encompassing in the first one comprehensibility indices;[38] or constructing AI

[37] E Cornelius 'Defining 'plain language' in contemporary South Africa' (2015) 44 Stellenbosch Papers in Linguistics, 1 ff., at 3.

[38] For the analysis of readability, the following can be considered: the Flesch index or, for the Italian language, the *Gulpease* index, and the core vocabulary (which for the Italian language is the Italian Basic Vocabulary (Vocabolario di Base) developed by Tullio De Mauro, Il Nuovo vocabolario di base della lingua italiana available at <https://www.internazionale.it/opinione/tullio-de-mauro/2016/12/23/il-nuovo-vocabolario-di-base-della-lingua-italiana>. From a linguistic point of view, comprehensibility can be analysed through text analysis from a linguistic and conceptual point of view. See E Piemontese, La scrittura: un caso di "problem-solving", in AR Guerriero (ed.), *Laboratorio di scrittura. Quaderni GISCEL* (La Nuova Italia 2002) 3-40, at 26. An attempt at encompassing lexical, morphosyntactic and syntactic parameters is currently, for the Italian language, in the tool READ-IT, available at <https://www.ilc.cnr.it/dylanlab/apps/texttools/?tt_user=guest>. A good description of the computational linguistic tool for legal language is in G Venturi, *Lingua e diritto: una prospettiva linguistico-computazionale*, (doctoral thesis, Università degli Studi di Torino, 2008-2011).

systems capable of assessing the clarity/readability and comprehensibility including additional and specialized parameters of transparency. [39-40]

The first two kinds of assessments relate to the industry-wide attention to the editorial criteria of texts (although not strictly contractual), which partly coincides with, and partly could augment, the currently usable readability and comprehensibility indices. These indices in their most sophisticated formulation calculate not only sentence and word length ratios, but also lexicon, syntax, the number of verbs (and nominalisations) and/or complements, and verbal forms, enabling an evaluation based on a standard user level. Such software neither recognizes nor is instructed with criteria proper to legal language and syntax.[41] For this reason, although they fail to intercept the characteristics and needs proper to legal language, they may be suitable for measuring, probably by default, the level of readability of a contractual text and may only constitute an initial measuring instrument.

Research in this area draws on computational linguistics and Natural Language Processing (NLP) techniques applied to legal texts. These approaches enable the calculation of quantitative linguistic and semantic indicators, such as lexical density, tokenization measures, syntactic complexity, and other text-based metrics, with the aim of assessing and modelling the comprehensibility and transparency of contractual language.[42]

Far from encompassing all components of transparency, these automatic and computational tools are not yet widely in use in the legal domanin.

Moreover, operationalizing the conditions for reading a text does not necessarily entitle one to understand it. The identification of unclear areas of texts, in light not only of the occurrence of certain linguistic forms, but based on texts that have already been recognized as obscure in jurisprudential experience or by empirical studies, could represent a support (and an *alert*) for the interpreter and a safeguard for the recipient of information.

The landscape could change with the advent of generative AI and the increasing capabilities of Large Language Models (LLMs). While research on contracts conducted using expert systems has shown that the main challenges lie in the construction of extensive databases, the costs and time required for initial training, and the mitigation of bias,[43] the emergence of Large Language Models (LLMs) may create new opportunities in this field. However, the use of LLMs to assess contractual clarity and transparency has not yet been the

[39] F Ruggeri and others, 'Detecting and explaining unfairness in consumer contracts through memory networks' (2022) 30 Artificial Intelligence and Law, 59-92; N Kolt, 'Predicting Consumer Contracts' (2022) 37 Berkeley Tech. L. J., 71 – 138.

[40] A first account is in B Boi and others, 'On exploiting LLMs and statistical methods for testing contractual clarity in legal contracts' (2025) *Proceedings of the 40th ACM/SIGAPP Symposium on Applied Computing, SAC '25*, New York, 1299–1300.

[41] One example is the Dylan software, developed by the CNR.

[42] A Bajceta and others, 'Using NLP tools to detect ambiguities in system requirements - A comparison study' (2022) *NLP4RE 2022: 5th Workshop on Natural Language Processing for Requirements Engineering*; Soavi, Mylopoulos, and M Soavi and others, 'Contratto – A Method for Transforming Contracts into Formal Specifications' in R Guizzardi, J Ralyté, X Franch (eds) *Research Challenges in Information Science. RCIS 2022. Lecture Notes in Business Information Processing* (Springer 2022) vol 446; K Upadhyay and others, 'Is Your Legal Contract Ambiguous? Convert to a Smart Legal Contract' (2020) *IEEE International Conference on Blockchain* (Blockchain), Rhodes, Greece, 2020, 412-418.

[43] On privacy policies G Grundler and others, 'Detecting Vague Clauses in Italian Privacy Policies Using Transformers, LLMs, and Cross-Lingual Techniques' in ECAI (2025) 459 ff.

subject of systematic investigation. Empirical research investigating whether LLMs can reliably measure and predict the transparency of contractual terms remains scarce.[44]

Most studies conducted so far have focused on broader interpretative tasks. A growing body of research has explored whether LLMs can identify the meaning – or possible meanings – of legislative and contractual provisions [45], thereby evaluating their ability to interpret legal texts. Other studies have examined whether LLMs can recognize and apply legal interpretative canons and hermeneutic principles.[46]

The assessment of legal text quality and the measurement of transparency constitute a distinct legal task. While it necessarily presupposes some degree of textual interpretation, it is not exhausted by it. It requires the evaluation of linguistic, semantic, and structural features that affect the comprehensibility of legal documents for their intended audience.

In particular, LLMs' ability to capture inferences, implicit meanings, and pragmatic aspects of language, may pave the way for the development of tools for legal text analysis, [47] with the final aim of avoiding empty formalisms and self-serving measurements.

These capabilities could be explored by including the transparency assessment parameters to realize the following objectives:

1)Extend first-generation readability metrics and comprehensibility indices[48], to comprehensive criteria of plain language and specialized language.

2) Evaluate the semantics of individual clauses, as well as that of the entire document to appraise the overall informational architecture and cohesion offered to the consumer, accounting for cross-references.

3) Assess informational *completeness* as intended above by evaluating whether the contractual text makes the relevant consequences and effects of the agreement (economic and legal) sufficiently explicit, rather than hidden or left to complex inferences, *e.g.*, through examples and the strategic placement. This objective requires the comparison between the LLM's assessment and human tests on the same tasks.

These computational needs can be addressed through a methodological architecture available for LLMs:[49]

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[44] Boi and others (n 40).

[45] C Engel and RH McAdams, *Asking GPT for the Ordinary Meaning of Statutory Terms, Public Law and Legal Theory Research Paper n. 848* (University of Chicago Law School 2024) 1–43; V Janecek and G Sartor, *Legal interpretation and AI: from expert systems to argumentation and LLMs, Forthcoming in International Handbook of Legal Language and Communication: From Text to Semiotics* (Springer 2026).

[46] E Martínez, 'Traditional and Computational Canons' (forthcoming 2026) 39 Harvard Journal of Law & Technology. Available at SSRN: <https://ssrn.com/abstract=5155444> or <http://dx.doi.org/10.2139/ssrn.5155444>.

[47] On LLMs' growing competence in pragmatic language understanding, see S Eo and H Lim, 'Unveiling the Limits of Large Language Models in Inferring Pragmatic Meaning from Non-Verbal Responses' (2026) arXiv:2606.01845v1 [cs.CL]; A Hota and JPP Jokinen 'Implicature in Interaction: Understanding Implicature Improves Alignment in Human–LLM Interaction' (2025) arXiv:2510.25426v1 [cs.CL].
It must be taken into account that while specific experiments on Unfair Clause Detection show that BERT-based models can yield better results than LLMs for clause classification tasks, a true judicial assessment of transparency inherently requires evaluating the global discursive structure.

[48] See above text correspondig to notes 38–40.

[49] Recent research on this point and the combination of these methods is being conducted by the Legal Clarity group at the ReCEPL Research Centre of Private Law (Suor Orsola Benincasa University of Napoli), especially within the project BACT&AI See the website <https://www.legalclarity.eu/bactai/>

1) Retrieval-Augmented Generation (RAG) Integration, to connect the LLM to a controlled dataset specifically trained on obscure and transparent clauses to ground the dataset definition;

2) Prompting Strategies, to prompt the LLM with a set of formal transparency rules (specific clarity elements described in psycholinguistic literature, pragmatic intelligibility criteria established by the Court of Justice of the European Union (CJEU) jurisprudence, and Plain Language rules) and to condition the LLM to simulate the cognitive and cultural competencies of the contract's specific recipient (the average consumer).[50]

The experiments made as well as a broader ethical view of the development of technology need to be taken into account in a project that aims to enhance the transparency assessment from a perspective of certainty and calculability.

The comprehensibility of a contractual legal communication entails compliance with general linguistic rules, but is also related to the specialized language, and sub-languages thereof, which in turn are characterized by specific terms, syntactic constructs, argumentative configurations, as well as the structure of the experience of the author and the (non-expert) recipient of the same.[51]

In this scenario, LLM capabilities should be driven by the intersection of computer science and legal expertise, aiming to identify optimal levels of human-machine collaboration through reliable testing and system designs engineered to prevent automation bias or undue influence on users.

[50] However, on the unexpected result of the "persona prompting" see EA Posner and S Saran, *Silicon Formalism: Rules, Standards, and Judge AI* (University of Chicago Law School Coase-Sandor Institute for Law & Economics 2026) Research Paper No. 26-02, where it was found that the LLM adheres to the legally correct outcome significantly more often than human judges.

[51] MA Cortellazzo, 'Giuridico-amministrativo, linguaggio', *Enciclopedia dell'italiano online* (Treccani 2010).