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Natural Language Processing – A Game Changer for Normative Reasoning in the Legal Discipline?

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1. Normative Reasoning

The main goal of the present working paper is to demonstrate why normative reasoning, as an essential task within the legal discipline, will face an existential change in the next decade due to technological progress through natural language processing. Our position, which will be based on a preliminary case study, is that natural language processing will fundamentally challenge the way we approach normative questions in (but not limited to) the legal discipline.

The present working paper is structured as follows. We will first discuss the importance of normative reasoning in the legal discipline. Secondly, we will outline the main technical features of natural language processing. Third, we will provide some arguments on why natural language processing could be a game changer, and lastly, we will refer to a case study in which we focused on four normative theories in tax law in order to demonstrate the capabilities of natural language processing with respect to normative judgements.

From a philosophical perspective, an important characteristic of normative reasoning is that this reasoning often revolves around essentially contested concepts. The conception was first proposed by Gallie.[1] According to this conception, concepts such as TAX FAIRNESS, DEMOCRACY, or JUSTICE are such that essential parts of their meaning are disputed. We particularly focus on essentially contested concepts or terms which reflect what is commonly known as a value-based judgment.[2]

One reason for the dispute is that the disagreement is due to larger-scale differences in worldviews. For instance, to a Libertarian, any kind of taxation that surpasses the absolute minimal amount necessary to ensure that a minimal state is functional (which, on their view, usually encompasses little more than the protection of individual freedoms and property) is per se unjust. To an Egalitarian, in contrast, taxation of a much more comprehensive extent is perfectly justified, as long as it contributes to a more equal distribution of wealth among

1 Walter Bryce Gallie, Essentially contested concepts, Proceedings of the Aristotelian society (1955), pp. 167 et seq. For recent discussions see David Collier, Fernando Daniel Hidalgo, and Andra Olivia Maciuceanu, Essentially contested concepts: Debates and applications, Journal of political ideologies (2006), pp. 211 et seq.; Philippe-André Rodriguez, Human dignity as an essentially contested concept, Cambridge Review of International Affairs (2015), pp. 743 et seq.

2 Concerning the question what a value or value-based judgement is in the legal field, see e.g. with further details Julia Hänni, Vom Gefühl der Rechtsfindung, Ph.D. Thesis, University of St. Gallen 2010, pp. 6 et seq.

the citizens. Hence, the Egalitarian's and the Libertarian's conception of tax justice differ substantially, and this difference is embedded in different views on the purpose of the state, the rights and duties of individuals, the moral assessment of economic success, etc.

2. Normative Reasoning in the Legal Discipline

The goal of this working paper is not to develop a comprehensive understanding of what normative reasoning means from a legal perspective. Others have contributed in much more detail.[3] However, we want to demonstrate how natural language processing can and (likely) will change the way we approach normative questions as lawyers. In order to do so, we need a common understanding of what normative reasoning means.

Normative reasoning is in simplified terms relevant for the following two tasks of the legal discipline:

- **Interpretation of existing provisions**: The way in which lawyers interpret legal provisions is highly influenced by normative reasoning. Through the process of interpretation, the interpreter demonstrates how he or she understands a certain provision (i.e. how a certain provision ought to be understood from the interpreter's perspective). Such process often includes reference to values such as fairness or justice, which are essentially contested concepts. These lines of argumentation are, prima facie, highly influenced by personal judgements. Of course, interpretation methodology narrows the discretion, but nevertheless, value-based judgements are of key importance in legal interpretation, and they often seem to be partial. To be more precise, values are required for the following issues:[4]

    - In case of discretionary provisions., i.e. a provision grants a judge a certain discretionary leeway.

    - In case of legal gaps. A fact pattern is not covered by the applicable law, either because the legislator has purposively decided not to

[3] See e.g. Joseph William Singer, Normative Methods for Lawyers, UCLA Law Review (2009), pp. 899 et seq.

[4] These categories have partly been derived from Julia Hänni, Vom Gefühl der Rechtsfindung, Ph.D. Thesis, University of St. Gallen 2010, pp. 51 et seq. There are other possibilities of categorization.

regulate a certain situation, or because the legislator has not thought of a certain situation.

- In case of concepts which require interpretation. This includes the fact that language is per se not clear and creates uncertainty.

- In case of a collision of rules or interests. This is the case if the application of two provisions would lead to two different results.

In the following, we will not further discuss classical debates about the concept of law and to what extent morality and written provisions might conflict.[5] Moreover, it is not the purpose of the present working paper to discuss which legal methods should be used in what form of hierarchy.

- **Legislative developments:** Lawyers play a key role in the development of new positive rules be it as members of Parliament or even more important as members of the executive body responsible for drafting of laws. And normative judgements are essential in the argumentation of lawyers either in favor or against a certain provision. Often, lawyers use constitutional principles or other general principles of law in order to base their decision on. However, the interpretation of these principles often requires value-based judgements and reference is again often made to essentially contested concepts such as justice or fairness. These references often might seem partial.

3. How Do Lawyers Approach Normative Questions?

As mentioned, the question of how a provision should be understood or how a provision should be designed is often answered by reference to essentially contested concepts such as justice or fairness. Reference to fairness or justice might not be explicit but can also be implicit. In very simplified terms, lawyers might argue in the following manners:

- Interpretation A is persuasive as it leads to a just result

- Rule A is better than rule B as it leads to a fair balance of rights and duties

[5] We will, for instance, not deal with the Hart-Dworking Debate about the importance of legal principles and what law actually is.

For instance, the following argument contains an implicit reference to unfairness:

- *"In general, the Supreme Administrative Court agreed with the statements made in the lower courts that the guidelines presented in the OECD Report on transfer pricing - although not binding on the Swedish tax authorities - give a favourable and **well-balanced elucidation** of the problems involved and are not contrary to Section 43, Subsection 1, of the Municipal Tax Act."*[6]

The term *"well-balanced elucidation"* contains an implicit reference to a fair result in the sense that various interests are balanced. However, the statement does not provide any details as to what a fair balance means. Statements can also be explicit with reference to an essentially contested concept, but the author does not provide further details on how such essentially contested concept shall be understood – let alone making a case for why it shall be understood that way. For instance, statements such as the following are not uncommon in the legal discipline:

- *"That in the absence of any permanent establishment in India in terms of DTAA [Double Taxation Avoidance Agreement], no profits alleged to have accrued to the appellant are there and consequently the levy of tax as made by the AO [= tax authority] is arbitrary, **unjust** and bad in law."*[7]

Importantly, the extent to which an author deals with essentially contested concepts differs significantly. Some authors might try to review normative theories such as libertarianism or Rawls "A Theory of Justice" within a legal analysis. Other authors simply deny any reference to normative theory either by explicitly arguing that within the scope of the article an in-depth analysis of the normative question is not possible or (worse) by not even trying to answer the normative question of what just or fair means.

Therefore, it is key to analyze whether natural language processing can be helpful to achieve more reflection and less arbitrariness in legal argumentation. To ground our approach on a philosophy of language as well as an epistemology that has stood the test of decades of debate in philosophy, we will refer to

6 Regeringsrätten (Supreme Administrative Court), 22 October 1991, Case number 117-1989, as outlined and translated in the IBFD Case Dataset.

7 ITAT, Mumbai, Mahindra and Mahindra Ltd. vs. DCIT, 9 April 2009, ITA Nos. 2606, 2607, 2613 and 2614/Mum/2000, Asst. Year: 1998-99.

Willard Van Orman Quine, one of the most influential philosophers of the 20th century.[8]

4. A Quinean View on the Epistemology of Essentially Contested Concepts in Legal Reasoning

4.1. Quinean Epistemology

Quine's approach towards the justification of claims, and hence, ultimately to knowledge can be described as justificatory monism: the only way to verify any claim is through empirical evidence.[9] Furthermore, in the earlier phase of his work, Quine understood "empirical evidence" in a materialistic way as *"impacts of various forms of energy on our sensory nerves*".[10] Therefore, put simply, for Quine, verification or falsification of a claim is always also an empirical, and never exclusively an analytical task. This is the hallmark of his empiricism.

Quine derives his justificatory monism from his verification holism in the following passage from his seminal article *Two Dogmas of Empiricism*:

> *But the total field is so underdetermined by its boundary conditions, experience, that there is much latitude of choice as to what statements to reevaluate in the light of any single contrary experience. No particular experiences are linked with any particular statements in the field, except indirectly through considerations of equilibrium affecting the field as a whole.*
>
> *If this view is right, it is misleading to speak of the empirical content of an individual statement – especially if it is a statement at all remote from the experiential periphery of the field. Furthermore it becomes folly to seek a boundary be-*

8 He is the second-most quoted contemporary philosopher in the authoritative Stanford Encyclopedia of Philosophy, see The Splintered Mind: The 295 Most-Cited Contemporary Authors in the Stanford Encyclopedia of Philosophy (schwitzsplinters.blogspot.com), last consulted on August 27, 2021.

9 Reto Gubelmann, Maddy vs. Quine on Innate Concepts. Revisiting a Perennial Debate in Light of Recent Empirical Results, Philosophia (2019), pp. 151 et seq.

10 Peter Hylton, Willard van Orman Quine, Stanford Encyclopedia of Philosophy Archive, as of 1 April 2014, section 4.1.

> *tween synthetic statements, which hold contingently on experience, and analytic statements, which hold come what may. Any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system. Even a statement very close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws. Conversely, by the same token, no statement is immune to revision. Revision even of the logical law of the excluded middle has been proposed as a means of simplifying quantum mechanics; [...]*[11]

Quine here reasons as follows. He first reaffirms the conclusion of several lines of argument in *Two Dogmas*: the evidence available to us to confirm our overall scientific theory (what Quine figuratively calls 'field' in this passage) underdetermines the theory insofar as a bit of experience that conflicts with our theory does not determine what precise statement of the theory it is contradicting.

In *Two Dogmas*, Quine's argument for this famous underdetermination claim is negative. Reductionism (the second dogma of empiricism) has failed, that is, no account has succeeded in showing how specific bits of experience are linked to specific bits of theoretical statements.

Hence, it is wrong to suppose that there are one-to-one correlations between specific experiences and specific statements of a theory. Thus, these statements do not have empirical contents on their own, which implies that they are not separately testable. In Two Dogmas, Quine boldly claims that it takes "the whole of science" to arrive at a testable empirical prediction.[12] This means that, as it were, every single bit of evidence is spread across the whole of science, potentially affecting each and every statement of it. We call this position verification holism. Quine never abandoned this verification holism, though he attenuated it somewhat, insofar as he came not to consider the whole of science

11 Willard Van Orman Quine, Willard Van Orman, Two Dogmas of Empiricism, in: From a Logical Point of View. Harvard University Press (1980 [1951]), pp. 42-43.

12 Willard Van Orman Quine, Willard Van Orman, Two Dogmas of Empiricism, in: From a Logical Point of View. Harvard University Press (1980 [1951]), p. 42.

as the minimal empirically significant unit, but rather sufficiently inclusive portions of theory, for example in his article Five Milestones of Empiricism[13] or in his late Pursuit of Truth.[14]

If verification holism is right, then it is misguided to claim that there is a specific class of statements which are true regardless of any empirical evidence. If it is true that every piece of empirical evidence always calls into question entire chunks of theory – including (among others) logical law statements, epistemic norms, and ontological claims – then every statement whatsoever can be called into question by empirical evidence. For instance, if empirical scientists (or philosophers) decide that, given certain evidence, it is fit to abandon the law of the excluded middle, the logician is unable to provide reasons against this that are solely based on logical considerations without reference to experience. Rather, she will have to show that the overall theory is more elegant and still able to accommodate the evidence if the law of the excluded middle is kept in place. Thus, the contribution to successful prediction of empirical data – supplemented with some rough and ready notions of theoretical elegance and simplicity – becomes the fundamental checkpoint for any claim whatsoever. This constitutes Quine's empiricist justificatory monism.

Hence, Quine draws far-reaching conclusions from his verification holism, that is, the claim that every bit of empirical evidence always corroborates or undermines a sufficiently inclusive portion of scientific theory. Quine urges that verification holism establishes that all statements, including purportedly analytical ones, can be called into question through recalcitrant empirical evidence. There is only a difference in degree, not in kind, regarding the power that empirical evidence has to falsify the law of the excluded middle, as opposed to the power that it has to falsify the clearly empirical hypothesis that there are now 444'444 people living in Zurich.

4.2. Legal reasoning and Quinean holism

For the field of legal reasoning, the implications of this Quinean holism are significant. Normative judgments are not untouchable by experience, if properly conceived. We suggest that, given Quine's empiricism, it is misguided to think

[13] Willard Van Orman Quine, Five Milestones of Empiricism, in: Theories and Things. Harvard University Press 1981, p. p. 71.

[14] Willard Van Orman Quine, Pursuit of Truth. 2nd ed. Harvard University Press 1992, pp. 14-15.

that the proper normative view on any issue, including legal questions arising in tax matters, can be, as it were, deduced *a priori* from a couple of self-evident principles (the rationalist's view). Rather, given Quine's empiricism, it is pivotal to remain ready to modify one's normative views in light of contrary experience, where experience must be properly understood.[15]

Therefore, confrontation with other ideas, statements or concepts might question our normative approaches.[16] In other words, it seems that normative judgements of lawyers might become more appropriate the more they face potential evidence that could lead to opposing views. It has also been argued by others that values are not "stubbornly there"[17] but values might develop over time.[18]

The question is, of course, what is considered to be an experience that might influence our moral judgement. Quine does not explicitly deal with such questions. However, we suggest that exposing oneself to normative arguments should count as experience. This is certainly not the materialist conception of evidence championed by Quine in the 1960ies and beyond. However, that conception has deep problems anyway and requires substantial modifications.[19] By combining this un-Quinean notion of experience with the thoroughly Quinean view that there are no statements whatsoever immune to revision on the grounds of experience thus conceived, we follow the spirit, but perhaps not the letter of Quine's empiricism.[20]

Let us refer to an example in order to explain this further. The following is a normative statement often found in tax law analysis.

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15 This is congenial to van Fraassen's seminal conception of Empiricism as a Stance, see Bas van Fraassen (2002). The Empirical Stance. Yale University Press.

16 We are not suggesting that Quine's naturalization of epistemology will also lead to a naturalization of law or the philosophy of law (see on the latter dispute Mark Greenberg, Naturalism in Epistemology and the Philosophy of Law, Law and Philosophy (2011), pp. 419 et seq.).

17 Ronald Dworkin, Justice for Hedgehogs, Harvard University Press 2011, p. 114.

18 Of course, this is not an empty field in legal writing as several authors have already discussed the question of whether and how values relevant for legal decisions might develop over time. See e.g. Julia Hänni, Vom Gefühl der Rechtsfindung, Ph.D. Thesis, University of St. Gallen 2010, pp. 202 et seq. with further references.

19 See Reto Gubelmann, Maddy vs. Quine on Innate Concepts. Revisiting a Perennial Debate in Light of Recent Empirical Results, Philosophia 2019, chapter 3.

20 Interestingly, Quineanism, so conceived, is rather similar to more "Continental" philosophies of language. In particular, it shares the emphasis on experiencing (albeit in slightly different senses) with Charles Taylor (2016). The language animal. Harvard University Press.

(N1) Treating people equally before the law requires that people with the same amount of income must be taxed at an equal rate.

On a Quinean view, the truth of (N1) cannot be decided purely *a priori* (there is no pure *a priori*). All justification, including the justification of normative claims in the legal domain, is answerable to experience, albeit perhaps in a very indirect way.

More specifically, we suggest that, on a Quinean view, normative statements such as (N1) occupy a middle ground between (almost) purely empirical statements such as "blue there" and (almost) purely theoretical statements such as the law of the excluded middle.

While normative statements are more directly answerable to experience than logical laws, they are clearly less directly so than observation sentences. For instance, imagine a legal scholar who is convinced of (N1). Then, she witnesses the devastation that (N1) creates in a family with many children, some of which have special needs: (N1) requires that the family be taxed at the same rate as a single person without any dependents. This experience does not logically refute (N1). The scholar could describe her experience as mere emotional weakness which is epistemically irrelevant. In this sense, there is epistemic room for maneuver here, as is typical for statements that are at some distance from experience. Still, as the example shows, it is more realistic that experience can refute (N1) than it is that experience refutes the law of the excluded middle.

In our case study, we try to illustrate how natural language processing can accelerate such processes of being confronted with data that is incompatible with one's normative position with the goal of improving, perhaps even changing this normative position. Therefore, what is habitually referred to as one's (ultimately subjective) moral intuition might, according to Quine, be considered a theory that can be developed and improved through experience, which includes exposing oneself to normative statements incompatible with one's own views.

5. Neural Natural Language Processing

The systems used in our case study are based on word and sentence embeddings produced by a specific type of NLP architecture, called BERT, as well as on architectures inspired by BERT (and hence very similar to BERT). In this section, we briefly introduce this type.

There is an important distinction between, on the one hand, symbolic AI, also called GOFAI (for "Good Old-Fashioned AI") and connectionist AI. Symbolic and connectionist AI represent two fundamentally different approaches to design computer programs that are able to intelligently fulfill certain tasks.[21] In brief, symbolic AI tries to address a certain task, say translating a sentence from Chinese into English, using explicit, in the typical case, hand-written rules that often essentially involve some sort of logical processing of the input, for instance by using traditional predicate logic. Things are very much different with connectionist models, or as they are usually called today, neural network models. Rather than explicitly specifying the rules by which a program is expected to solve a given task, neural network models consist of nested mathematical structures, so-called cells, whose parameters, also called 'weights', are set during a so-called training phase. If the training phase is successful, the parameters have been set in such a way that the overall model delivers satisfactory performance at the task at hand.

Currently, the majority of natural language understanding (NLU) systems are based on the so-called transformer architecture. Introduced by Vaswani et al. for machine translation, part of the architecture has been used with impressive success for both NLU and natural language generation (NLG).[22]

NLU is the area of NLP that focuses on tasks that would, for a human being, require understanding the language in question. For instance, NLU encompasses answering questions about a given text, summarizing text, and finding logical relationships between assertions in a text.

Most current NLU-systems are inspired by BERT, an offspring from the transformer architecture.[23] BERT is being trained on general tasks, such as predicting the next word in a text, on very large amounts of data for a long time. Then, it is trained a second time for a much shorter time on much less data for the specific task at hand, say detecting logical relationships. The ratio between the former training, also called pre-training, and the latter training, also called fine-tuning, is in the area of 1000:1.

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21 For an introduction to GOFAI, see Margaret A. Boden, 4 GOFAI, in: The Cambridge handbook of artificial intelligence, Cambridge University Press 2004, pp. 89 et seq. For an introduction to connectionist AI, see Ron Sun, Connectionism and neural networks, in: The Cambridge handbook of artificial intelligence. Cambridge University Press 2014, pp. 108 et seq.

22 Vaswani, Ashish et al., Attention is All you Need, in: NIPS (2017).

23 Jacob Devlin et al., BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding, in: NAACL-HLT (2019).

In NLP, “training” refers to a mathematical process that runs autonomously. Roughly, this process runs as follows:

1. Initialize all the parameters in the model with random values.

2. Let the model make a number of predictions.

3. Optimize the weights of the models such as it can be expected that it will make better predictions next time.

6. Why Natural Language Processing Could Be a Game Changer

As we will see in the following, natural language processing has the potential to become a game changer in the legal field. And we are here not focusing on topics close to legal practice (e.g. the use of natural language processing to review a huge amount of case law in order to figure out whether there has been any similarity to the disputed case[24]). We are more focusing on the question of whether NLP might accelerate academic progress in the legal discipline.

In particular, we see promise of progress in the following four areas:

- First, it is often argued that impartiality (in this context also called objectivity) as part of a legal interpretation process is difficult to achieve if not illusionary, as each of us has a different preunderstanding, i.e. an understanding of a term out of the context of a specific legal provision. In principle, such criticism is justified. However, we tend to believe that the more we are faced with statements and arguments which might deal with a similar interpretation problem from a different normative point of view, the more we will be inclined to take these points of view into account and hence produce a more impartial and in this sense more objective assessment. We have already sketched how this ties in with a Quinean epistemology of law.

- Second, it has become common to have several commentaries about the same law. However, some commentaries remain rather

[24] See e.g. https://hai.stanford.edu/news/natural-language-processing-ready-take-legal-hearings, last consulted on 18 August 2021.

superficial. One reason is that it is extremely time consuming to review all existing opinions about a certain topic. Therefore, natural language processing might allow authors to develop a more in-depth line of argumentation in the same amount of time as natural language processing might allow a pre-selection of reading material.

- Third, those who tend to refuse any debate about essentially contested concepts such as fairness or justice might face more pressure as natural language processing is able to detect and categorize normative statements within seconds. Therefore, natural language processing will help to detect normative statements in a legal text, which will compel authors, especially those who tend to deny any value-based reasoning in their text, to deal with values, as a computer system might be able to calculate to what extent an argument contains a value-based judgment.

- Fourth, and this is likely the most ambitious goal: Natural language processing might even allow to assess scholarly writing in an objective manner in the sense that it seems feasible that natural language processing will be able to measure the depth of certain arguments and by doing so it might provide lawyers with a tool to assess the depth of an entire article.[25]

7. Case study: Using NLP to Navigate Normative Claims in Tax Law Discussions

To explore the promises of NLP in navigating normative judgments in tax law, we have conducted two different experiments. The first experiment is a clustering experiment, the second experiment is a classifying experiment. In a clustering task, the goal is to group together samples that should be close together, while in a categorizing task, the goal is to label samples correctly. For instance, given the four normative categories identified below – Deontological, Rawlsian, Procedural, Libertarian – the goal of clustering is to group all Rawlsian statements close together (as well as the Deontological, etc.), while the goal of the

[25] In certain contexts, such systems are already available, compare Thiemo Wambsganss et al. (Apr. 2020). "AL: An Adaptive Learning Support System for Argumentation Skills". In: ACM CHI Conference on Human Factors in Computing Systems.

categorizing experiment is to label all samples that are in fact Rawlsian as Rawlsian (and all Deontological samples as Deontological, etc.).

For the clustering, we manually grouped 10 samples of each of the four normative categories identified. This yields a total of 40 samples that were submitted to the clustering experiment. The samples are all grammatical sentences taken from academic writing, and their categorization was conducted by an expert in the field. Then, a trained philosopher without specific expertise in the field went through the examples and annotated any disagreements. Where the disagreements could not be resolved by discussion, a different sample, whose categorization was uncontroversial, was chosen.

7.1. Clustering

In this experiment, we wanted to explore the promises of using embeddings produced by transformer-based Language Models (LMs) that are all cognates of the very influential BERT architecture (see above, section 5) and two different clustering algorithms with various configurations. In these experiments, the LMs delivered so-called embeddings, which were then grouped with the different kinds of sorting algorithms. Roughly, the embeddings deliver high-dimensional vector representations that have been shown to represent semantic as well as syntactic features of the words or sentences that they represent.

In our clustering experiment, these embeddings are of central importance. If the models produce embeddings such that embeddings caused by sentences categorized as Rawlsian are close together in the vector space in which the embeddings are located, this will greatly facilitate the clustering.

Without entering into any unnecessary technicalities,[26] our results show that the best performing systems manage to deliver impressive results (compare Figure 1). It shows that the system has largely clustered correctly: In each of the four groups identified, one of the four categories dominates clearly. For instance, the cluster in the second row has 9 total members, 8 of which belong to the Rawlsian category.

[26] For these details, see Reto Gubelmann, Peter Hongler, and Siegfried Handschuh, Exploring the Promises of Transformer-Based LMs for the Representation of Normative Claims in the Legal Domain, 2021, arXiv:2108.11215.

largest membergroup	total members	homog.	wh	lmg label
8	9	0.89	0.20	Rawlsian
9	13	0.69	0.23	Libertarianism
8	9	0.89	0.20	Procedural
6	9	0.67	0.15	Deontological

Figure 1: The results of the multilingual model.

We take this result of the first experiment as very encouraging. If we consider that the models used in these experiments were not fine-tuned to the specific genre, namely legal texts, let alone to the task at hand, namely clustering normative statements, then it becomes clear that this marks merely the lower boundary of what is possible with more substantially adapted and optimized models.

7.2. Bootstrapping for Classification

In this second experiment, we took the two models that have been shown to perform best to build very simple classifiers, so-called k-nearest-neighbors (kNN) classifiers. They function as follows. You need a number of categorized samples; in our case, we used the 40 samples described above. Then, for any new sentence to be classified, you first run the sentence through the model to obtain the embeddings, then you classify the new sentence according to its embeddings' k nearest neighbors in the vector space. For instance, if k=3, you would classify according to the category that has three of its members closest to the three samples.

The input for our kNN-classifying experiment is given by four texts focusing on tax law, belonging to various text sorts (see the appendix for details). One of them is a research article, akin to the articles from which the 40 samples were taken, one is a memo of a parliamentary debate from Canada, one is a tax-law related discussion directed at the educated public, and one is a research article focusing on Chinese situations. Given the samples used to create classifiers, we expect the classifiers to perform best on the research article, then on the specifically Chinese research article, then on the publication directed at the general public, and finally on the parliamentary memo.

Importantly, the goal of this experiment was less to test whether the performance of these models is correct, and more to test whether it is on a level that is useful for experts to enter into an interaction with the model. From a tech-

nical perspective, 10 samples per category are simply too little to expect competitive classifying performance. However, the number of samples is sufficient to:

1. Get an idea of the general prospects of the approach, and to

2. Investigate whether the results are good enough to initiate a bootstrapping loop with an expert.

With a bootstrapping loop, we mean the following. What the systems need are more samples. Instead of burdening experts with the time-consuming task of going through entire articles and finding such samples, we let the classifier, as it currently exists, suggest such samples. The expert then merely needs to select the good ones from these suggestions. These good ones can then be fed back into the system, which then, with better performance, suggests further samples, and so on. In the best case, this process will improve not only the performance of the system, but also the expert's understanding of the field.

The results are shown in table 2. We only counted a result as true positive if it also returned the correct categorization – in addition to simply correctly realizing that a sentence was normative.

Article 1 Overall, the classifier has split the article up into 55 sentence (or sentence-like) elements. Of these, 3 are normative in either the Rawlsian, Procedural, Deontological, or Libertarian sense in focus here. The distilroberta-based classifier has returned 3 positives, two of which are true positives. The multilingual-based classifier has returned four positives, three of which are true positives

Article 2 Overall, the classifier has identified 100 different sentences, 24 of which contain normative statements. The distilroberta-based classifier returns 14 positives, eight of which are true positives. The multilingual-based classifier returns 22 results, 11 of which are true positives.

Article 3 Overall, the classifier has split the article up into 99 sentences. Of these, 6 are normative in the specific ways in focus here. The multilingual-based classifier has 14 positives, 5 of which are true positives, and 9 are false positives. The distilroberta-based models show only 2 positives, none of which are true positives.

Article 4 Overall, the classifiers have identified 100 sentences. Of these, 3 are normative in the specific ways in focus here. The distilroberta-based classifier has 2 positives, none of which are true positives. The multilingual-based classifier has 10 positives, two of which are true positives.

Classifier	Art.1	Art.2	Art. 3	Art. 4
distilroberta	0.67/0.67	0.57/0.3	0/0	0/0
multilingual	0.75/1	0.5/0.46	0.36/0.83	0.2/0.67

Table 2: Results of the classifying experiment. We report precision/recall.

The results of the two classifiers are encouraging, given the goal of building a classifier that can initiate a bootstrapping loop. In particular, it is notable that the two classifiers both deliver very few false positives, given the fact that in all four texts, normative claims were a small minority (roughly 10% per document). These figures seem well enough to initiate the bootstrapping loop envisaged above.

Furthermore, given the very simple calculation of the boundary between normative and non-normative, this is further evidence that the embeddings used in these experiments are promising for further analyses of normative judgments: Simple geometric properties of them can be used to draw a good distinction between normative and non-normative.

Furthermore, a qualitative inspection shows that the results that the model delivers fall into three categories.[27]

Category 1: Clearly useful. The following example falls into this category, as it is a very good instance of a statement from a clearly Rawlsian normative background.

(N2) […] In recent decades, the increasing concentration of capital gains in the hands of the wealthy, and the reduction in tax rates on capital gains, have been substantial factors behind the increase in economic inequality. Because of the

[27] For these details, see Reto Gubelmann, Peter Hongler, and Siegfried Handschuh, Exploring the Promises of Transformer-Based LMs for the Representation of Normative Claims in the Legal Domain, 2021, arXiv:2108.11215.

stepped-up basis loophole, a large share of wealthy people's capital gains escapes taxation. Lower rates are not the only way the tax code gives preferential treatment to capital gains, however.

Category 2: Clearly wrong. The systems do deliver a number of positives that are clearly false. The following example falls into this category.

(N3) There are a number of arguments against a tax reduction.

The sentence has been classified as "libertarian", however, it is not per se a libertarian argument.

Category 3: Thought-Provoking. The third, and perhaps most interesting results consist of positives that are false at first sight, but upon reflection, the expert was not so sure anymore. The following is such an example.

(N4) It [i.e. the Committee] heard from a wide range of witnesses, including academics, tax experts, economists from private consulting firms, and investment professionals.

Prima facie, such sentence does not contain any normative content, however, it contains procedural elements as the Committee assessed various opinions.

8. Conclusion

In this article, we have argued in a loosely Quinean way that research in tax law, and in the theories of tax justice underlying this research, would greatly benefit from engagement with the various normative points of view that are in play in these debates. However, to engage them, they must be made explicit. We have suggested that there is great potential in NLP to achieve this, that is, to make these normative backgrounds explicit that are presupposed by tax legal arguments, and we have also shown that there is evidence to suppose that direct interaction by experts with these systems might benefit not only the systems, but also the experts themselves, as it unveils aspects of their field that they have so far failed to notice.

9. Appendix

9.1. Description of Normative Categories Used in the Case Study

A review of existing literature on tax justice or tax fairness written by lawyers, economists but also political theorists shows that the underlying argument in favor or against a certain tax policy proposal (e.g. a higher or lower tax rate) is often made based on justice or fairness considerations. However, it is often not obvious what the authors' understanding of justice and/or fairness is. Nevertheless, reference is at least implicitly often made to one or several of the existing theories of justice or to a broader theory of ethics. The goal of the present paper is to assess whether natural language processing is able to detect if a certain sentence contains normative elements and if yes how to categorize such statement. In order to do so, it is necessary to choose some normative theories to which statements can be attributed. We have chosen the following:

- Libertarianism
- Rawlsianism
- Proceduralism
- The Deontological View

Such selection of categories is to a certain extent arbitrary, and so is the actual categorization. Nevertheless, as a starting point, our selection can be justified by the simple fact that these seem (besides Utilitarianism) to be the main arguments used in scholarly writing, and it is generally clear to which category a given normative statement belongs (even though, of course, there are boundary cases). This is an important fact about normative discussions. The arguments used in a normative debate are not unlimited, but they often boil down to a few positions based on larger theories of justice.

For follow-up projects, it would of course be possible to apply a more diverse categorization. Such categorization could include egalitarianism, luck egalitarianism, liberal egalitarianism, left and right libertarianism, and various forms of utilitarianism. In particular, we plan to employ the bootstrapping method introduced above (section 7.2) to obtain both more examples as well as an overview on the actual positions used in research literature on tax law.

In the following, we will briefly describe how we understand the various categorizations and, moreover, we will outline some examples of arguments falling under these categories.

Libertarian arguments

As mentioned, the goal for now is not to develop an in-depth understanding of what tax policy suggestions should be derived from a libertarian theory of justice, but to group statements that prima facie seem to reflect a libertarian position. Therefore, we will in the following outline extracts from scholarly papers that we take to reflect libertarian ideas.

The essential idea is that the market outcome regarding income and wealth distribution is just and deserved and, therefore, taxation should not lead to redistribution or as famously held by Nozick: *"taxation of earnings is on a par with forced labor"*[28]. For instance, the following statement is attributed to a libertarian way of thinking for the purpose of the present paper.

- *He argues that as a prima facie position, not only is progressive taxation difficult to justify, but so also is any taxation, the purpose of which is to redistribute wealth. Nozick's analysis is based upon an individualistic conception of rights and he argues that such taxation is equivalent to an involuntary forced transfer of an individual who has a right to retain possession and control of it.*

Rawlsian arguments

The essential idea of a Rawlsian argument in favor or against a certain tax policy proposal relates to his famous difference principle. We are fully aware that this reflects an oversimplification, and of course it does not consider the entirety of Rawls approach to societal justice. But again, the goal of the present paper is to assess certain statements and demonstrate how natural language processing can help to categorize normative statements.

Rawlsian arguments are arguments in favor of a justified level of inequalities. This includes arguments in favor of redistribution, e.g. through progressive taxation. Therefore, Rawlsian arguments focus on the redistributive effect of the

[28] Robert Nozick, Anarchy, State, and Utopia, New York, Basic Books 1974, p. 169.

tax system in the sense that the tax system may help in reducing unjustified inequalities to a level which is in favor of the least well-off in a society.[29] Therefore, we categorize these redistributive arguments in a broad variety of forms as Rawlsian for the purpose of the present study.

For instance, the following statement is considered to be Rawlsian:

- *In a society which employs an income tax, distributive shares of income are determined by subtracting from gross income the amount of tax paid. An income tax is thus a part of society's distributive mechanism and must be designed in accordance with the governing principles of social justice.*

Procedural arguments

Other theories of justice highlight that a just society is the outcome of free deliberative debate about the main design elements of the societal structure. This includes, for instance, a Habermasian approach[30] aimed at achieving just societal structure based on a democratic decision-making process.

Of course, also Rawls' "A Theory of Justice" is a procedural theory of justice as the principles of justice derive from a procedural approach (i.e. the original position), however, for the purpose of the present paper, procedural arguments are understood as arguments either in favor or against a certain tax policy suggestions based on an exchange of ideas in a deliberative process. Our procedural positions have also a flavor of pluralism, as we have categorized position as "procedural" if they refer to the fact that discussing or debating various positions will lead to a better solution.

Therefore, the overall approach of such category is that a certain proposal is just because it is derived from a broad-based process of decision-making. The following example contains procedural arguments:

- *This means that the possibilities of applying ethical rules of taxation should be presented in the tax system. This can be achieved, if all possible standpoints are taken into account, especially the overlapping contradictions and the conflicts of interests, and the taxation justice is*

[29] John Rawls, A Theory of Justice, Harvard University Press 2007.
[30] Jürgen Habermas, Theorie des kommunikativen Handelns, Suhrkamp 1995.

proven to legitimize the tax authority of the State and contribute to the tax attitudes that are desirable from the point of view of the State.

Deontological arguments

The term deontological ethics covers a broad variety of approaches.[31] These approaches all follow the main rationale according to which the action per se should be morally right or wrong and not the consequences of an action. Therefore, deontological ethics is mainly defined as not being consequential ethics (i.e., a negative definition).

For the purpose of the present paper, we consider arguments as deontological arguments if they suggest a certain tax policy proposal focusing on the treatment of the tax payer and not based on the distribution of the income within a society. Of course, this is again an oversimplification of deontological argumentation, however, the category helps us to cover the widespread argument that tax payers should be treated equally (i.e. horizontal equity).

Deontological arguments seem to be the best category for these approaches. It would definitely be wrong to categorize these normative arguments as egalitarian. Of course, also Rawls follows a deontological path in his "A Theory of Justice" and, therefore, Rawlsianism can be conceived as a species, likely the most important species, of the Deontological view. In a follow-up research project, a key element should be a more detailed definition of various deontological positions.

We consider the following argument to be deontological for the purpose of the present paper:

- *Perhaps the most widely accepted principle of equity in taxation is that people in equal positions should be treated equally.*

[31] See e.g. Larry Alexander and Michael Moore, Deontological Ethics, The Stanford Encyclopedia of Philosophy (Summer 2021 Edition), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/sum2021/entries/ethics-deontological/, last consulted on 18 August 2021.

9.2. Full Dataset

Following is the list of the 40 expert-chosen statements with their categorization, as they have been used for the experiments.[32]

Libertarianism

(a) Regardless of how the matter is stated, the entitlement version of libertarianism posits that coercive taxation is anathema (or, at least, should be kept to the bare minimum), and whatever level of taxation is allowed on no account should be used for redistribution, especially of the top-to-bottom kind

(b) The principle of compensatory justice sets an upper limit on the taxes that may be demanded from an individual. According to Nozick's conception of

[32] The following statements are derived from the following publications: Brian D Galle, Tax Fairness, 65 Wash. & Lee L. Rev. 1323-1379 (2008); David Elkins, Horizontal Equity as a Principle of Tax Theory, 24 Yale L. & Pol'y Rev. 43-90 (2006); Richard A Musgrave, The Theory of Public Finance: a Study in Public Economy, McGraw-Hill 1959; John A Miller, Equal Taxation: A Commentary, Hofstra Law Review: Vol. 29: Iss. 2, Article 4 (2000); Jörg Alt, Ethics III: Tax Justice vs. more just taxation, Ethics Discussion Paper of the „Tax Justice & Poverty Research" (2019); Michelle D Layer, Tax Justice and Same-Sex Domestic Partner Health Benefits: An Analysis of the Tax Equity for Health Plan Beneficiaries Act, University of Hawaii Law Rev. Vol. 32, No. 73 (2009); Jonathan A Rowe, Oliver Oldman, Matthew S Watson, Business Property Taxation: Assessment, Inventory Tax, Replacement Revenue, and Tax Shifts, American University Law Review Volume 29, Issue 2 (1979); Jörg Alt, Musonda Kabinga, Emmanuel Tendet-Kiprotich, An Argument Regarding 'Tax Justice', Ethics Paper 06 of the "Tax Justice & Poverty Project" (2018); Joseph M Dodge, Theories of Tax Justice: Ruminations on the Benefit, Partnership, and Ability-to-Pay Principles, FSU College of Law Public Law and Legal Theory Working Paper No. 150 (2005); C Eugene Steuerle, And Equal (Tax) Justice for All?, Urban Institute Press Tax Justice: The Ongoing Debate (2002); Graeme S Cooper, Income tax law and contributive justice: some thoughts on defining and expressing a consistent theory of tax justice and its limitations, Australian Tax Forum, 3(3), 297–332 (1986); Charles R T O'Kelley, Rawls, Justice and the Income Tax, Georgia Law Review Vol 16, No 1 1-32 (1981); Miranda P Fleischer, Libertarianism and the Charitable Tax Subsidies, 56 B.C. L. Rev. 1345 (2015); Richard A Epstein, Taxation with Representation: Or, the Libertarian Dilemma, Canadian Journal of Law & Jurisprudence, 18(1) 7-21 (2005); Donald Ray Escarraz, Wicksell and Lindahl: Theories of Public Expenditure and Tax Justice Reconsidered, National Tax Journal 20, No 2 137-148 (1967); Andrzej Gomuùowicz, Principle of Tax Justice and Tax System, Viesoji Politika Ir Administrativimas, 15 57-61 (2006); Richard Murphy, The foundations of tax justice, Tax Research LLP Tax Briefing (2010); Philip T Hackney, Political Justice and Tax Policy: The Social Welfare Organization Case, 8 Tex. A&M L. Rev. 271 (2021); Jane I Guyer, Representation without Taxation: An Essay on Democracy in Rural Nigeria, 1952-1990, African Studies Review Vol. 35, No. 1 41-79 (1992); Frans Vanistendael, Legal Framework for Taxation, in: Victor T Thuronyi , Tax Law Design and Drafting, Volume 1, IMF 1996); Jussi Jaakkola, A Democratic Dilemma of European Power to Tax: Reconstructing the Symbiosis Between Taxation and Democracy Beyond the State?, German Law Journal, 20(5) 660-678 (2019); Jacqueline Cottrell, Tatiana Falcão, A climate of fairness: environmental taxation and tax justice in developing countries, VIDC (2018); Christian Aid and SOMO, Tax Justice Advocacy: A Toolkit for Civil Society (2011); Network Advocates for Justice, inspired by catholic sisters, Principles of Tax Justice (n.a.); Kas Sempere, Integrating Tax Challenges of Local Market Traders in International Tax Justice Campaigns, ICTD Research in Brief Issue 19 (2018).

individual rights, utilitarian considerations can never justify a violation of rights. Within the limits imposed by compensatory justice, efficiency will determine the exact outlines of the tax.

(c) Individual equity emphasizes that we are entitled to the rewards of our efforts and from the trades and transactions that we make and thus is closely related to traditional market notions of efficiency.

(d) Economic rewards in the market are both just and good, because they come from satisfying the needs and desires of others. If Shaquille O'Neill becomes obscenely rich, that's because vast numbers of people are willing to pay big bucks to watch him exercise his skills. You may think professional sports are silly, but who are you to tell others what they should want? Redistributive taxation is taking from those who are entitled to market rewards and giving to those who are not.

(e) He argues that as a prima facie position, not only is progressive taxation difficult to justify, but so also is any taxation, the purpose of which is to redistribute wealth. Nozick's analysis is based upon an individualistic conception of rights and he argues that such taxation is equivalent to an involuntary forced transfer of an individual who has a right to retain possession and control of it.

(f) In a society structured in accordance with the principles of natural liberty each person is considered morally entitled to his natural talents and abilities and to whatever reward he is able to obtain through free exchange with others. Whatever distribution of income or other primary social goods results from a system of free exchange is necessarily just and the needs of the least advantaged are left to charity.

(g) The libertarian will quickly respond that we have missed the point. The claim is not that we are entitled to our income because we deserve our natural talents. Rather we are entitled to our income because we exercise our talents in a relationship of voluntary exchange with others. lt is the productive act and its product to which we are entitled.

(h) Some strands of libertarian thought suggest that the charitable tax subsidies are in and of themselves illegitimate. These strands of libertarianism forbid not only redistribution but also anything except the most minimal provision of public goods needed to protect life and property, such as defense. Yet several other strands do see a role for the state to produce varying amounts of public goods and engage in some redistribution, ranging from providing a safety net to the very poorest to assisting victims of past injustices.

(i) Views within that set have much in common with each other (individuals should be free from coercion; the free market should be left undisturbed to the greatest extent possible; and large-scale redistribution of the type in modern welfare states is unjust), even if they differ in their rigidity

(j) In another recent debate, Walter Block again maintained that all state power should be regarded as illegitimate in view of the catastrophic losses that sadistic leaders of perverted states had inflicted on the helpless individuals over whom they rule. I also had a recent debate with Jeffrey Rogers Hummel, whose stated position was that the great advance of the nineteenth century was the elimination of chattel slavery, and that the great unmet social goal was the elimination of taxation, which was the equivalent of chattel slavery

Rawlsian

(a) By employing taxation, adherents of this vision will also attempt to secure social cohesion, equality in opportunity for all, including social and income mobility.

(b) The predicted outcomes of the climate crisis are just one of several dimensions of inequality when it comes to environmental policy. This report has shown that there could be a role for environmental taxation in addressing these inequalities, and that the vision and objectives of the tax justice movement and the implementation of environmental taxation can indeed be compatible in theory and in practice.

(c) So much reliance by a government on VAT for its revenue can end up deepening inequality in a country

(d) Because tax justice helps enable the provision of basic services and the achievement of greater equity, everyone is a stakeholder in tax justice campaign.

(e) Our federal tax code contributes to damaging inequality in our nation and must be reshaped to ensure all pay their fair share. We are called to invest in a society that will meet the needs of all, especially those at the economic margins; this is a core tenet of our faith teaching. tax reform should make the tax code more progressive, raise revenue to support vital programs, and decrease inequality. tax justice will be a step toward mending the gap in income and wealth and toward a society and an economy of inclusion.

(f) A just tax system should help us build a more equitable society and begin to reverse the damaging inequality created by prior tax breaks designed to benefit the wealthiest

(g) In a society which employs an income tax, distributive shares of income are determined by subtracting from gross income the amount of tax paid. An income tax is thus a part of society's distributive mechanism and must be designed in accordance with the governing principles of social justice.

(h) Any difference in wealth, power, or opportunity that is, any inequality - is just only if allowing the differences maximizes the live prospects of the least advantaged.

(i) The rate of income tax must be calculated to produce the maximum revenues for transfer to the least advantaged, taking into account any disincentive effect

(j) In the broad sense, tax justice explores pro-poor and redistributive tax systems able to reduce income and social inequality. It involves a transparent process of pro-poor collection (those who have less, pay less) and pro-poor expenditure (those who have less, receive more), for instance, through public services

Procedural

(a) Thus, within this institutional framework, the question is what changes in rules of the legislature can be made that will cause the government to provide just taxation or at least approximate justice in taxation. Even in his normative theory, he specifically accepted approximate justice, through an approximate unanimity rule, because it was the most that could be hoped for in the real world.

(b) If less then unanimity exists someone must be coerced into accepting the goods or services at the taxes levied. The absence of unanimity is therefore the absence of tax justice.

(c) Respecting the standards in the legislative process that follow from the principle of tax justice is very obvious when it comes to substantiation.

(d) This means that the possibilities of applying ethical rules of taxation should be presented in the tax system. This can be achieved, if all possible standpoints are taken into account, especially the overlapping contradictions and the conflicts of interests, and the taxation justice is proven to legitimize the tax authority of the State and contribute to the tax attitudes that are desirable from the point of view of the State.

(e) Raise representation within the democratic process because it has been found that only when an electorate and a government are bound by the common interest of tax does democratic accountability really work; and finally to facilitate:

(f) I argue that we should also ask whether a tax policy is politically just. By politically just, I mean tax policy that does not hinder an equal voice in our collective decision-making, and may even promote it. We should pursue not just a best results vision of justice in tax policy, but a popular-will sense of justice as well.

(g) Beyond such specific concerns, I believe however, lies the accurate perception that in a more open form of political process, and in a system in which bureaucratic governance can be neither achieved nor afforded at all levels, diplomatic persuasion and endorsement of people's own agendas are the main legitimate tools for relating the government to the people: for setting up the constraints of taxation systems or endorsing their functional equivalents in rural communities, municipalities and boardrooms where people have only intermittently faced them before, or for envisaging some other medium of participation and accountability

(h) The first principle is that any tax must have a firm basis in law. Much of the history of Western political movements has been based on opposition to arbitrary taxation.

(i) The normative coupling of taxation and representation asserts a procedural condition for legitimacy. Justified extraction of revenues through taxation necessitates that those who are liable to taxes consent to their imposition and consent happens, in effect, through representatives.

(j) "Consent-based taxation requires that the source for authorization to collect taxes does not reside beyond taxpayers but resides in the citizens themselves. Citizens affected by the adoption of taxes are represented in parliamentary proceedings, thereby participating in the political process through which taxes are instituted. In this sense, citizens are not taxed by the government or the Crown, but rather they tax themselves."

Deontological

(a) In order for revenue-raising to serve its basic function, and to command widespread popular acceptance, it must be open to any reasonable view of good government. It follows, albeit along a twisty path, that the principles underlying the revenue function should give significant weight to pre-existing distributions of societal goods.

(b) Still, most of us probably think that it is important that laws that differentiate between us at least be justified with some significant moral or policy argument.

(c) Perhaps the most widely accepted principle of equity in taxation is that people in equal positions should be treated equally

(d) They contended that persons in like circumstances should be taxed equally (horizontal equity)

(e) A more just taxation is that which treats the equal equally and the unequal unequally, in accordance with the principle of the ability to pay.

(f) In order to achieve horizontal equity, the tax justice system must avoid arbitrary distinctions among similarly situated taxpayers on the basis of differences in status.

(g) Under current law, the Internal Revenue Service ("IRS") allows taxpayers to exclude from income certain employer-provided health care benefits. This tax exclusion reduces costs to employers by reducing payroll taxes and compensation expectations, and it reduces the tax burden on individuals by lowering their taxable income. But the tax exclusion for employer-provided health benefits is not equally available to all taxpayers. Gays and lesbians who receive health benefits for their same-sex spouses or domestic partners are unable to claim the exclusion. This unequal treatment results in significant tax inequities for same-sex couples.

(h) Presently, some business properties are ’paying much more than their proper share and others are paying much less. The problem can best be solved, first, by making uniformity the objective and, second, by developing the skills to do it adequately.

(i) He says that the objective of uniformity at fair market value has never been faithfully followed. Still, this does not detract from the fact ’that these concepts have been enshrined in constitutions and in statutes and have been reiterated from time to time by the courts, all of which says a lot about what people have wanted.

(j) To us there is no difference between equal and just treatment as long as the equal is treated equally and the different is treated differently which corresponds to the horizontal and vertical justice dimensions of the Principle of Ability to Pay.

9.3. Details on Texts Used for Bootstrapping Classification

The input for our kNN-Classifying experiment is given by four articles focusing on tax law, belonging to various text sorts, where the expert suspected – but did not

antecedently identify – indirectly normative claims. Article 1 is a tax-related discussion directed at the educated public.[33] Article 2 is a research article, akin to the articles from which the 40 samples were taken.[34] Article 3 is a research article focusing on Chinese situations.[35] This article has been published in a peer-reviewed journal focusing on tax issues in the Asia Pacific. Article 4 is a memo of a parliamentary debate from Canada.[36] Given the samples used to create classifiers, we expect the classifiers to return the best results on article 2, then on article 3, then on article 1, and finally on the parliamentary memo, that is, on article 4.

[33] See here: https://www.americanprogress.org/issues/ economy/reports/2020/09/28/490816/capital-gains-tax-preference-ended-not-expanded/, last consulted on August 20, 2021.

[34] Section B from Edward D Kleinbard. 2016. Capital taxation in an age of inequality. S. Cal. L. Rev., 90:593.

[35] Diheng Xu. 2021s. Evaluation of value added tax exemption for small and low-profit enterprises in china–an analysis based on the principle of proportionality. Asia-Pacific Tax Bulletin, 27(3):1–7.

[36] https://sencanada.ca/Content/SEN/Committee/362/bank/rep/rep05may00-e.htm, last consulted on August 20, 2021.