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Deontic Modality in English-Thai Legislative Translation: A Corpus-Based Study

Mali Satthachai and Dorothy Kenny

Dublin City University

Abstract

Scholarly interest in legislative translation has grown substantially over recent decades, with corpus-based approaches contributing to our understanding of the relationship between translated legislation and source texts, on the one hand, and translated and non-translated legislative texts in the target language, on the other. To date, however, most studies have been conducted on European languages. This study is part of a first attempt to use corpus techniques to explore legislative translation from English into Thai. Drawing on a purpose-built, 400,000-word, parallel corpus of international treaties translated from English into Thai, and a one million-word monolingual corpus of legislative texts originally written in Thai, we investigate how instances of deontic modality are translated into Thai. We analyse the modal strength of translations and conduct our inter-linguistic and intra-linguistic comparisons in the light of Biel's (2014) concepts of 'equivalence' and 'textual fit'.

Keywords: Thai, English, legislation, deontic modality, textual fit, equivalence

Introduction

In linguistic theory, a sentence used in communication is usually seen as consisting of a 'proposition', describing a state of affairs, and a 'modality', expressing concerns that the speaker or writer has towards that proposition (Iwasaki and Ingkaphirom 2005, 133). Two broad types of modality are commonly recognized: 'epistemic

modality' is described by van Fintel (2006, 20) as concerning "what is possible or necessary given what is known and what the available evidence is"; while 'deontic modality' concerns "what is possible, necessary, permissible, or obligatory, given a body of law or a set of moral principles or the like" (van Fintel 2006, 20).[1] It is perhaps unsurprising then that the expression of deontic modality is "a key generic feature" of legislation (Biel 2014, 158). As Kurzon (1986, 15-16, quoted in Biel 2014, 158) puts it, legislative sentences are, after all, "speech acts with the illocutionary forces of permission (may), ordering (shall) or prohibition (shall not)." But despite the obvious importance of deontic modality in legislation, to date few studies have been conducted on deontic modals in legislative *translation*, and those studies that do exist appear to be based solely on European languages (e.g., Knežević and Brdar 2011; Biel 2014). This study breaks new ground by investigating deontic modality in a purpose-built parallel corpus of legislative texts translated from English into Thai. It also draws on a monolingual corpus of legislative texts originally written in Thai to enable comparisons between translated and non-translated texts in that language. After comparing the distribution of individual modal verbs in the English and Thai texts in the parallel corpus, on the one hand, and in the Thai translations and non-translated texts, on the other, to see how deontic modality is normally expressed in translation into Thai, we proceed to focus on 'modal strength' in translation, drawing on previous treatments that recognize strong and weak deontic obligation and permission (e.g. Palmer 1986). The work presented here is largely descriptive and forms part of a more comprehensive project (Satthachai forthcoming 2019) designed to explore Thai legislative translation. Preliminary findings regarding the translation of English passive voice into Thai are available in Kenny and Satthachai (in press).[2]

The article is structured as follows: the next section addresses deontic modality. It provides an overview of previous treatments of deontic modality in Thai, and in translation generally, and further explains the notion of modal strength. Our research questions are then set out and the corpora under study in this research are introduced. Our approach to data extraction, sampling and analysis is explained, before detailed

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[1] Palmer (1986: 102) adds a third category, namely 'dynamic modality', which is concerned with the ability and disposition of a participant.

[2] A broader discussion of the cultural and historical context in which translation into Thai takes place is beyond the scope of this article. There is a general lack of research published in this area, but the interested reader is referred to Loos (2004), whose discussion of family law in Siam (as Thailand was known until 1939) touches briefly upon translation.

results are presented. The paper concludes with some observations on the limitations of the research, and ideas for future work.

Deontic Modality in English and Thai

The linguistic study of deontic modality traditionally focuses on modal verbs (Aijmer 2016, 496), also known as 'modal auxiliaries' or just 'modals'. English modal verbs are often grouped into (a) 'core modal verbs' namely: can, could, may, might, will, shall, would, should and must,[3] and (b) 'semi-modal verbs', e.g. dare, need, ought to and used to (Carter and McCarthy 2006, 638). In English, deontic modal auxiliaries include verbs that express deontic obligation (sometimes referred to as 'deontic necessity'), for example, 'shall', 'must' and 'will', and verbs that express deontic permission (sometimes referred to as 'deontic possibility'), for example 'may' and 'can'.[4] The corpus-based investigation of deontic modality is complicated by the fact that, in many languages, including English and Thai, a single form can express more than one type of modality (for example, the modal verb 'must' can be used either epistemically or deontically). While it is often easy to distinguish, for example, between epistemic and deontic uses based on formal criteria, in some instances the polyfunctionality of modal forms can nonetheless lead to interpretative ambiguity (Palmer 1986, 19).

Like English modality, Thai modality is traditionally divided into epistemic and deontic types (Iwasaki and Ingkaphirom 2005, 133), and can also be realised by modal verbs and other modal expressions. With specific regard to deontic modality, Iwasaki and Ingkaphirom (2005, 133-137) recognize four modal auxiliaries expressing obligation, namely: ต้อง /tong/ (must), จำเป็น /jum-pen/ (be necessary), ควร /khuan/ (should) and น่า /na/ (should).[5] Although other modal auxiliaries can be used to express deontic modality—as we will see below—these other modals are not listed by Iwasaki and Ingkaphirom (2005), perhaps because of their polyfunctionality.

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[3] While there is debate in the literature over the status of 'will' as a modal (see, for example, Salkie 2010), the use of this verb in legislative texts to express obligation (much like 'shall' does) encourages us to view 'will' as a deontic modal (see Table 7).

[4] Other parts of speech may also be used to express modality, but as it transpires that there are no relevant deontic examples in our corpus, we do not elaborate on this point here.

[5] Thai lexemes are presented here and elsewhere with an accompanying phonetic transcription (between two forward slashes) and an English-language gloss (in parentheses).

The co-occurrence of modal verbs is acceptable in Thai. The 'serial verb' จะต้อง /ja/+/tong/, for example, does not have a straightforward counterpart in English, but it can be glossed as 'will' + 'shall', 'must' or 'have to'.[6] (For the sake of brevity, we usually gloss this serial verb using 'will+must'.) Knežević and Brdar (2011,120) note a similar phenomenon in Croatian, which also allows the concatenation of modals in structures like *Moraš moći učiti* *You must can learn. Even though similar structures exist in other languages like Croatian, the fact that English does not allow serial verbs and so has no structure corresponding to จะต้อง /ja/+/tong/ means that from the point of view of English-to-Thai translation จะต้อง /ja/+/tong/ is a 'unique item' as first proposed by Tirkkonen-Condit (2002), and elaborated upon in our Discussion section.

Modal strength

As mentioned earlier, linguists often refer to 'modal strength', and view modal forms as capable of expressing 'strong' or 'weak' necessity or possibility (Narrog 2016), or something in between these poles. Some linguists refer to 'degrees of modality' (see Narrog 2009, 64-65) and organise modal expressions into scales along which expressions increase or decrease in degree. Halliday and Matthiessen (2004, 116, 148-149), for example divide deontic modal operators into 'high' (e.g. 'must'), 'median' (e.g. 'will', 'should') and 'low' (e.g. 'can', 'may') categories. Huddleston (2002, 175-177) distinguishes between 'necessity' (e.g. 'must', 'need'), 'possibility' ('may', 'can') and 'medium modality' ('ought to'), while Knežević and Brdar (2011) grade deontic necessity according to 'degree of commitment' and use the terms 'obligation' for strong obligation, 'necessity' for weaker obligation, and 'advisability' where there is an implication that an obligation may not be fulfilled, among others.[7] According to Narrog (2016, 100), the expression of different levels of modal strength appears to be limited to the area of necessity. Thus, there are numerous descriptions of languages using labels such as strong and weak obligation but strong and weak permission are generally not found (ibid.). We likewise take the view that obligation modals can be graded according to their modal strength, but it makes little sense to compare the strength of permission modals. Having said that, between category-

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[6] A serial verb is defined by Iwasaki and Ingkaphirom (2005: 231) as "a grammatical structure in which two or more verbs or verb phrases appear together without a marker of coordination or subordination".

[7] Narrog (2009:64-65) gives a useful summary of approaches to modal strength or degree of modality.

comparisons are valid (as in Knežević and Brdar 2011), so it is possible to say that any given obligation modal is stronger than any given permission modal, even if one permission modal cannot be stronger than another permission modal.

Thai deontic modal verbs also express different degrees of strength, with Iwasaki and Ingkaphirom (2005, 133-137) claiming that ต้อง /tong/ (must) expresses the strongest obligation, followed by จำเป็น /jum-pen/ (be necessary), ควร /khuan/ (should) and น่า /na/ (should).[8]

Modality and Modal Strength in Translation

Deontic modality in legislative translation has been studied by Biel (2014), who compares EU legislation translated from English into Polish with original Polish legislative texts. Biel's research design involves both a 'parallel' corpus of English legislative source texts and their translations into Polish, and a 'comparable' corpus of legislation originally written in Polish, a design that is emulated in our work. Biel is most interested in establishing the 'textual fit' of the translations, where 'textual fit' is a target-pole oriented measure defined as the 'linguistic distance between translations and non-translations of a comparable genre' (Biel 2014, 287). Textual fit complements 'equivalence', defined simply as the relation of translations to their source texts, in that they are both facets that are critical for the quality of translation (ibid.). As part of her study, Biel investigates the distributions of various modal forms in her corpora, and the possible reasons for differences between translations and non-translations. She finds that obligation modals (verbs) are "strongly overrepresented" in translated Polish compared to original Polish, while deontic phraseological patterns are "strongly underrepresented" (Biel 2014, 289). She concludes that "modals are strongly affected by interference and translators rarely strive to overcome it and conform to the conventions of national legislation" (2014, 169). Biel also finds that "[d]ifferences in the distribution of deontic modals across the corpora indicate that

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[8] It should be mentioned here that the range of modal verbs imposing obligations and indicating permission in Thai is smaller than in English, and a single Thai modal can thus be used to gloss more than one English modal. For example, ต้อง /tong/ is the Thai gloss of 'shall', 'must' and 'have to'. ควร /khuan/ is the Thai gloss of 'should' and 'ought to'. Conversely, more than one English modal can gloss a given Thai modal.

modality is very sensitive to goals of sub-genres" (ibid.). She does not investigate modal strength as such.

Knežević and Brdar (2011) and Martikainen (2016) are among the few sources that investigate modal strength in translated texts, although only the former are concerned specifically with deontic modality. They investigate deontic modal verbs in a 23,000 word corpus consisting of a piece of Croatian legislation, *Plan prihvata broda u nevolji*, and its translation into English as 'Plan for the Acceptance of a Ship in Distress' and observe shifts in modal strength in the translation. Most shifts (7 out of 113 instances) relate to an intensification (Wilcox and Shaffer, 2008, 229) from 'necessity' in Croatian to 'obligation' in English. Although shifts in the opposite direction are also observed, they are fewer in number at two (Knežević and Brdar 2011, 135-136). While the amount of data that Knežević and Brdar (2011) examine is limited, their results are still interesting because they show that shifts in modal strength, while rare, are attested in legislative translation. The authors conclude that the reason for such shifts lies in "the lack of clear and unitary syntactic rules in Croatian" with the use of two particular modal verbs in Croatian described as "generally widespread" but "arbitrary" (2011, 142). Knežević and Brdar (2011) also stress the importance of context in the interpretation of the deontic meaning of particular verbs.

Martikainen (2016) investigates translation errors and biases in human and machine translations of medical abstracts from English into French. She homes in on markers of epistemic modality, and thus is concerned with scales of certainty rather than obligation and permission. Her research is nevertheless of interest here as she shows how some English modal markers are translated into more affirmative, and thus 'stronger' French counterparts. More specifically, "the modal auxiliary 'should' is frequently translated into French by the indicative form of the verb '*devoir*' in the present or the future tense (equivalent of 'must'), instead of the corresponding conditional form" (Martikainen 2016, 167). In most cases, she argues, the translations do not lead to bias, as these more affirmative modal markers are typically used in the target context and are likely to be expected and correctly interpreted by the readers (ibid.); that said, in some cases the more affirmative translations can influence the readers' interpretation of the level of certainty of the authors (ibid.).

The present article is the first attempt, to our knowledge, to investigate the translation of modality and degrees of modal strength in translation between English and Thai legislative texts.

Research Questions

In this article we are interested in both the relationship between source texts and translations ('equivalence' relations as defined by Biel 2014, 287), and between target texts and other texts in the same language (Biel's 2014 'textual fit'). We set out to answer two main questions:

1. How are instances of deontic modality translated from English into Thai in legislative texts?

2. Are there differences between how deontic modality is typically expressed in legislation translated into Thai and how it is expressed in legislation originally written in Thai?

Corpora

Our research draws on two corpora:

1. a bilingual parallel corpus consisting of English legislative texts aligned with their Thai translations; and

2. a monolingual corpus consisting of legislative texts originally written in Thai.

Table 1 gives an overview of the parallel corpus:

	English Source texts	Thai translations
Size	172,739 words	222,556 words
Number of texts	25	25
Medium	Written	Written
Genre	Legislation	Legislation
Sub-Genre	International treaties	International treaties

Publication date	1950s to present	1950s to present
Authenticity	Yes	No
Authorship	Legal experts	Professional translators

Table1: English-Thai parallel corpus design

As Table 1 indicates, the parallel corpus contains the text in English and Thai of 25 international treaties that have come into force since the 1950s, and where international treaties fall into the broad category of 'legislative texts' as defined by Cao (2010, 79). The word counts for the corpus are produced by Sketch Engine (Kilgarriff et al. 2014).[9] The English language versions of the treaties are considered 'authentic' in the sense that they are recognised as authoritative and as having legal force (Hermans 2007, 8; Šarčević 1997, 20). The Thai translations, on the other hand, are merely 'informative' (Cao 2007, 10). They serve as an explanation of the authentic version, but do not in themselves have legal force. Their lack of legal authenticity makes them no less important to their users however; on the contrary, their very existence attests to an acute need at the organisations where they are prepared and used. For example, the translations of the Charter of the Association of Southeast Asian Nations (ASEAN) and the United Nations Conventions contained in the parallel corpus were completed mainly by the Department of Treaties and Legal Affairs of the Thai Ministry of Foreign Affairs, and are used by even high-ranking officials, who are generally not fluent in English. The English and Thai texts also differ in their authorship, the former having been drafted by legal experts, the latter by professional translators, and, of course, in the translation condition—the English texts are originals, but the Thai texts are translations.

The original texts and translations were obtained from the websites of government ministries, departments and agencies. A manual search of all relevant websites was conducted specifically to locate international treaties and their translations. For example, the 'Double Tax Agreement' and its translation into Thai were located on the website of Thailand's Revenue Department, while the ASEAN Charter referred to above was retrieved in English and Thai from the Thai Ministry of Foreign Affairs.

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[9] The SWATH (Smart Word Analysis for Thai) word tokenizer was used by Sketch Engine to recognise running words (tokens) in the Thai corpus. It was developed by Paisarn Charoenpornsawat and is available for download from http://www.cs.cmu.edu/~paisarn/software.html.

All international treaties found in this way were downloaded for inclusion in our parallel corpus. In other words, no further sampling was conducted. Our aim was rather to build as big a parallel corpus of international treaties as possible, based on the resources that were available in 2016. Given that the translated texts were collected from a number of different sources, they represent the output of a range of translators. It is difficult to find information on the exact conditions under which the translations were created, however, as there are, to our knowledge, no published accounts of contemporary translation activities in Thai ministries, departments and agencies, and it was not possible to elicit information on translation processes through personal contacts, despite our best efforts. To our knowledge, however, there are no standard style guides or protocols that apply to translation across all Thai ministries, government departments and agencies.[10]

Table 2 gives an overview of the monolingual Thai corpus:

Size	1,173,485 words
Number of texts	123 texts
Language	Thai
Medium	Written
Genre	Legislation
Sub-Genre	Constitution, codes and acts
Publication date	1970s onwards
Authenticity	Yes
Authorship	Written by legal experts

Table 2: Thai monolingual corpus design

The monolingual Thai corpus is over 1.1 million words in length (again as calculated by Sketch Engine) and contains 123 different texts. These texts are deemed to be

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[10] A full list of texts included in our parallel corpus, along with an indication of their provenance, is provided in the Appendix to this article. A list of texts included in our (much larger) monolingual corpus is available from the authors. Copyright permission for the texts in both corpora is not required because the use of the texts falls within an exception pursuant to section 32 (1) of the Copyright Act of Thailand B.E 2537 (1994), stipulating that the use of copyrighted work for research or study which is not for profit shall not be deemed an infringement.

comparable to the translations in the parallel corpus, by virtue of shared values for attributes such as 'Medium', 'Genre' and 'Language'. They contrast with the Thai texts in the parallel corpus in having different values for 'Authenticity' and 'Authorship', as the Thai texts in this case are authentic and are written by legal experts. The specific types of legislative text (called a 'sub-genre' here, following Biel 2014) contained in the monolingual corpus are also somewhat different from those in the parallel corpus, as international treaties are not drafted as original texts in Thai. The monolingual corpus instead contains other types of legislative texts. Care has been taken to select only primary legislation for inclusion in the monolingual corpus, so as to maintain parity of status between the texts included in both parallel and monolingual corpora. The monolingual corpus thus includes the Constitution of Thailand, and codes and acts, texts that fall into the two highest ranks of Thai legislative texts, as identified by Uwanno (2000, 4). The texts were obtained from the website of the Office of the Council of the State.[11] As with our parallel corpus, we downloaded all instances of primary legislation available from this source at the time of corpus creation (2016), and no further sampling was conducted.

The monolingual corpus is also substantially larger than the Thai side of the parallel corpus. This is partly due to the relative ease with which monolingual corpora can be created, compared to parallel corpora (see, for example, Bowker and Pearson 2002, 95), but the larger size of the monolingual corpus allows us to have greater confidence in making claims about what is 'normal' in legislative texts in Thai. Quantitative comparisons between the Thai translations and the Thai monolingual corpus are enabled by normalizing frequencies of occurrence of selected linguistic features, and thus reporting frequencies per million words.

Both corpora were compiled from scratch for the purposes of this research. The parallel corpus was aligned manually in a format suitable for use with the Sketch Engine corpus-processing platform,[12] and both corpora were uploaded to the platform in text format. The English side of the parallel corpus was part-of-speech tagged

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[11] http://www.krisdika.go.th/wps/portal/general_en (accessed January 2017).
[12] https://www.sketchengine.eu/user-guide/user-manual/corpora/setting-up-parallel-corpora/#tab-id-2 (accessed December 2018).

automatically using the default English Tree Tagger (Sketch Engine, 2018). As no part-of-speech tagger was available for Thai, the translations remained untagged.[13]

Research Procedure

Our investigation begins with the identification of modal verbs in the English side of our parallel corpus, more or less following the methodology used by Biel (2014). Using Sketch Engine's Wordlist function, we retrieve a frequency-ranked lemmatized list of all words (types) in the corpus that have been assigned the part-of-speech tag 'MD' (for 'modal'). Given the polyfunctionality of modal verbs addressed earlier, we check (using the software's Concordance view) a random sample of the hits to see if any of them can be interpreted epistemically. After verifying that is not the case, we start examining the frequency of deontic modals in the English sub-corpus. For the sake of completeness we also search for other forms of modality in our corpus: again using the Wordlist function in Sketch Engine, we generate a list of candidate modal adverbs/adjuncts and modal adjectives as identified by Palmer (1986). Inspection of the results from this search shows that there is a small number of epistemic modal adverbs and adjectives in our corpus, but there are no deontic uses of these word classes. Our analysis is subsequently restricted to deontic modality as realised by modal verbs.

Having established the distribution of deontic modal verbs in the English side of our parallel corpus, we then compare the English lines containing each of these verbs with their Thai translations. We are interested here in how English modals are translated generally, but also in whether there are shifts in modal strength as identified in previous studies. In a final step, we compare our findings from the parallel corpus with data from our monolingual Thai corpus to see if the modal verbs used in the Thai translations are overrepresented or underrepresented when compared with the Thai monolingual corpus. On the Thai side of the parallel corpus and in the Thai monolingual corpus, we cannot use the Wordlist function to find the frequency of modal verbs due to limitations of the word tokenizer and the lack of a part-of-speech

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[13] We use the term 'part-of-speech tagger' here to maintain consistency with Sketch Engine and normal usage in computational linguistics. The term 'part of speech' is considered by some linguists to be deprecated, however, with most preferring the term 'word class'. We use 'word class' synonymously with 'part of speech' in this article.

tagger for Thai. We thus conduct direct searches for the Thai deontic modals which have been found as translations of English modal verbs in the parallel corpus. These searches are conducted using Sketch Engine's Concordance tool.

A final word here is said about our sampling strategy: as already indicated, given the polyfunctional nature of most modal verbs, it is essential to check the context in which modal forms occur, to verify that they are, indeed, deontic uses of the forms in question. This requires the analyst to inspect concordances from the corpus, which can be a time-consuming process. In cases where there are too many instances of a form to make manual inspection of all of them possible, we generate a random sample of instances (using the Random Sample function in Sketch Engine), and base our judgments on this sample. Our random samples consist of either 100 instances of each form, or 10% of the total number of occurrences for that form (for extremely frequent forms), as illustrated respectively by 'may' and 'shall' in Table 4.

Results and Analysis

In this section, we present results first from the English side of our parallel corpus, then from the Thai translations, and finally we compare our Thai translations with original Thai in our monolingual corpus.

Deontic modal verbs in the English source texts
The lemmatized frequency-ranked wordlist output by Sketch Engine indicates that there are 4,337 occurrences of ten different modal verbs in our English source texts. Their distribution is summarised in Table 3.

Modal verbs	Number of occurrences	Percentage
1. shall	3,202	74
2. may	745	17
3. should	131	3
4. will	102	2.5
5. can	61	1.4
6. would	52	1.2

7. must	24	0.55
8. could	11	0.25
9. might	6	0.13
10. ought to	3	0.07
Total	4,337	100

Table 3: Frequency of modal verbs in the English source texts

The most striking result in Table 3 is the very high frequency of 'shall'. There are 3,202 instances of 'shall' accounting for 74% of all instances of modal verbs in the corpus. Using the Wordlist function to find the overall frequency ranking of 'shall' in our English source texts, we find that 'shall' comes in sixth place, after 'the', 'of', 'and', 'to' and 'in'. The frequency of 'shall' is thus very high in this small English corpus.

The second most frequent modal verb in our English source texts is the deontic permission verb 'may', accounting for 17% of all modal verbs. The relative frequencies of the remaining modal verbs in our corpus ('should', 'will', 'can', 'would', 'must', 'could', 'might' and 'ought to') are at 3% or lower.

We further investigate only the five most frequent deontic modal verbs, dividing them into two groups—deontic obligation ('shall', 'should' and 'will') and deontic permission ('may' and 'can'). With the exception of 'can', which tends to be used epistemically or dynamically, the vast majority of the forms in question are instances of deontic modality in context, as illustrated in Table 4:

Modal verb	Number of occurrences	(Random) sample size	Used as deontic modal verbs
shall	3202	320	320
should	131	131	126
will	102	102	101
may	745	100	100

can	61	61	12

Table 4: Deontic obligation and permission modal verbs

Thai translations of English deontic modal verbs

Table 5 shows the overall distribution of Thai translations of the English modal 'shall'.

Thai translations of 'shall'	English gloss/ equivalent structure	Number of occurrences	Percent age
non-modal declarative	subject+verb	93	29
จะ /ja/	will	93	29
Thai causative starting with ให้ /hai/ (hai structure)	hai+subject+verb hai+verb	69	21.5
จะต้อง /ja/+/tong/	will+must	45	14
ต้อง /tong/	shall/must/have to	35	11
ควร /khuan/	should	13	4
อาจ /aat/	may	2	0.6
lines missing	-	4	1.4
total		320	100

Table 5: Thai translations of deontic modal 'shall'

As Table 5 indicates, based on our random selection of 320 concordance lines, we find that 'shall' is translated into Thai as follows: 29% of instances are translated into a Thai non-modal declarative form. A further 29% are translated using จะ /ja/ (will). Translation of 'shall' into a Thai causative form accounts for 21.5%, while 14% of instances of 'shall' are translated by the previously mentioned serial modal จะต้อง

/ja/+/tong/ (will+must). The closest Thai equivalent of 'shall', [14] ต้อง /tong/, appears in only 11% of cases. The translators also employ weaker deontic modals, namely ควร /khuan/ (should) and อาจ /aat/ (may), accounting for 4% and 0.6% of cases respectively.

There are 126 instances of deontic 'should' in the English texts and we investigate all concordance lines.

Thai translation of 'should'	English equivalent	Number of occurrences	percentage
ควร /khuan/	should	106	84.1
ต้อง /tong/	shall/must/have to	5	4
จะ /ja/	will	5	4
จะต้อง /ja/+/tong/	will+shall/must/have to	4	3
non-modal declarative	subject+verb	3	2.4
อาจ /aat/	may	1	0.8
lines not translated	-	2	1.6
total		126	100

Table 6: Thai translations of deontic modal 'should'

Table 6 shows that the majority of instances of 'should' (approximately 84% of cases) are translated by the Thai modal ควร /khuan/, as expected. In 11% of cases 'should' is translated using stronger modals however, namely ต้อง /tong/ (must) (4%), จะ /ja/ (will) (4%), จะต้อง /ja/+/tong/ (will+must) (3%), and non-modal declaratives (~2%), and in one case, it is translated into the deontic permission modal, อาจ /aat/ (may).

101 occurrences of 'will' are used deontically in the English sub-corpus. Their Thai translations are shown in Table 7.

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[14] By 'closest equivalent' here, we mean the form that we would expect to be used as an equivalent, on the basis of Thai native-speaker intuition.

Thai translation of 'will'	English equivalent	Number of occurrences	percentage
จะ /ja/	will	67	66.3
non-modal declarative	subject+verb	27	26.7
ต้อง /tong/	shall/must/have to	4	4
ควร /khuan/	should	2	2
จะต้อง /ja/+/tong/	will+shall/must/have to	1	1
total		101	100

Table 7: Thai translations of deontic modal 'will'

66% of instances of 'will' are translated as จะ /ja/, as expected. Over a quarter (27%) of instances of 'will' are translated into present simple structures without a modal verb. The remainder are translated into the stronger modals ต้อง /tong/ (must) (4%), ควร /khuan/ (should) (2%), จะต้อง /ja/+/tong/ (will+must) (1%).

Tables 8 shows Thai translations for the deontic permission verb 'may'.

Thai translation of 'may'	English equivalent	Number of occurrences	percentage
อาจ /aat/	may	64	64
non-modal declarative	subject+verb	13	13
สามารถ /sa-mart/	can	10	10
ต้อง /tong/	shall/must/have to	3	3
จะ /ja/	will	5	5
ควร /khuan/	should	1	1

Lines not translated		4	4
total		100	100

Table 8: Thai translations of deontic modal 'may'

'May' occurs 745 times in the English sub-corpus, so we investigate a random sample of 100 concordance lines. 64% of instances are translated as the Thai modal อาจ /aat/, as expected. 13% of instances use declaratives with no modal verb to translate sentences with 'may'. 10% of instances are translated by another deontic permission modal, namely สามารถ /sa-mart/ (can), while 9% of instances are translated using deontic obligation verbs in Thai.

There are twelve instances of deontic 'can' in the English sub-corpus (Table 9). The most frequent translation is, as expected, สามารถ /sa-mart/, accounting for ten instances, while one instance is translated as the Thai deontic obligation จะ /ja/ and another one by the Thai causative 'hai+verb'.

Thai translation of 'can'	English equivalent	Number of occurrences	Percentage
สามารถ /sa-mart/	can	10	84
จะ /ja/	will	1	8
Thai causative starting with ให้ /hai/ (hai structure)	hai+verb	1	8
total		12	100

Table 9: Thai translations of deontic modal 'can'

Deontic Modals in Monolingual Thai and Thai Translation

Table 10 compares the frequencies of selected deontic modal verbs in the Thai translations in our parallel corpus and in our comparable monolingual Thai corpus. The selected modal verbs are the six Thai modal auxiliaries that appear as translations of the English modals under investigation in the previous section, namely:

1. ต้อง /tong/ (an equivalent of 'shall', 'must' or 'have to')
2. จะต้อง /ja/+/tong/ (an equivalent of 'will'+ 'shall', 'must' or 'have to')
3. จะ /ja/ (an equivalent of 'will')
4. ควร /khuan/ (an equivalent of 'should' or 'ought to')
5. อาจ /aat/ (an equivalent of 'may')
6. สามารถ /sa-mart/ (an equivalent of 'can')

Thai modal verbs	Thai Monolingual Corpus size: 1,173,485	Thai translations Corpus size: 222,556	Log-likelihood Score (LL Scores)
	Number of occurrences *(frequency per million)*	Number of occurrences *(frequency per million)*	
ต้อง /tong/ (shall/ must/ have to)	4,899 *(4,174.74)*	598 *(2,686.96)*	116.04
จะต้อง /ja/+/tong/ (will+shall/must/have to)	828 *(698.77)*	619 *(2,781.32)*	585.15
จะ /ja/ (will)	4630 *(3,948.51)*	1743 *(7,831)*	531
ควร /khuan/ (should)	151 *(128.67)*	*274 (1,231.15)*	505.63
อาจ /aat/ (may)	1,209 *(1,030.26)*	571 *(2,565.64)*	283.11
สามารถ /sa-mart/ (can)	704 *(599.9)*	172 *(772.83)*	8.42

Table 10: Thai deontic modals in translation and monolingual sub-corpora

From the figures in the Table 10, based on the basic descriptive statistics, we find that 5 out of 6 modals are overrepresented in the translations when compared with the Thai monolingual texts, while one is underrepresented. We test for statistical

significance using the UCREL log-likelihood wizard, created by Paul Rayson. According to the UCREL log-likelihood (LL) test,[15] if the LL score is greater than 6.63, the probability of the result happening by chance is less than 1%, and if the LL score is 3.84 or more, the probability of it happening by chance is less than 5%, and we are 95% certain of the result. As such, the LL score must be above 3.84 for the difference to be significant. All differences reported in Table 10 reach statistical significance.

Of the overrepresented forms, จะต้อง /ja/+/tong/ (will+must) is almost four times more frequent in the Thai translations (2,781.32 occurrences per million words) than in the Thai monolingual corpus (698.77 per million words). Likewise, the frequency of จะ /ja/ (will) in translation (7,831 per million words) is about five times higher than that in original texts (3,948.51 per million words). The frequency of ควร /khuan/ (should) in Thai translation texts (1,231.15 per million words) is almost 10 times higher than that in the Thai monolingual texts (128.67 per million words). The relative frequency of the permission modals อาจ /aat/ (may) and สามารถ /sa-mart/ (can) is slightly higher than that in the monolingual texts.

There is only one modal verb, namely ต้อง /tong/ (shall/must/have to), that is underrepresented in translation. Its frequency in the Thai translation is slightly lower than that in the Thai monolingual texts.

Discussion

Source-language modals

Our first finding of note, relates to the high frequency of occurrence of 'shall' in our English source texts, accounting for 74% of all instances of modal verbs. Given the use of 'shall' to impose strong obligations, its high frequency in legislative texts may not be surprising. It is worth remembering, however, that the Plain Language Movement that took hold in the major English-speaking countries in the 1970s, aimed, among other things, to rid legal English of the word 'shall' (Williams, 2009, 199-208). The modal 'shall' has thus been eliminated from a number of prescriptive legal texts particularly in the major English-speaking countries of the southern

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[15] The detail of the calculating method can be found in the website of the University of Lancaster regarding Statistics in Corpus Linguistics: https://corpora.lancs.ac.uk/clmtp/2-stat.php.

hemisphere–Australia, New Zealand and South Africa; nevertheless, the major international organizations in the northern hemisphere such as the United Nations, the International Labour Organization or the European Union still prefer to use the archaic word 'shall' in their legislative texts (Williams 2009, 200). The fact that our English sub-corpus contains only international treaties which have had legal force since the 1950s, and the majority of which were drafted by the United Nations, might explain why there is such a high frequency of deontic modal 'shall' in our English corpus. Similar results are reported by Biel (2014, 159), who finds that 'shall' accounts for two thirds of obligation modals found in the English-language legislative texts in her study, which emanate from the European Union. Our finding that 'may', the second most common deontic modal in our English texts, accounts for 17% of deontic modals in our corpus is also broadly in line with Biel (2014, 166-169), who finds that permission modals are significantly less frequent than obligation modals in her English legislative corpus.

Relations between source and target texts

Turning now to the translation into Thai of English modal verbs, and concentrating firstly on relations between source and target texts (Biel's (2014) 'equivalence' relations), we can make the general claim that slightly more than half (50.5%) of all instances of the most common deontic modal in our corpus, 'shall', are translated in a way that departs from formal equivalence (or 'formal correspondence' in Catford's (1965) terminology). In other words, the translations do not use modal verbs to translate modal verbs. Rather, these instances of 'shall' are translated into Thai non-modal structures, either in declarative form (29%) or causative form with the word ให้ /hai/ (21.5%).

As already indicated, the expression of deontic modality is not limited to modal verbs, and according to Williams (2009), under the Plain Language Movement, the use of present simple is encouraged as a replacement of 'shall' to lay down general principles in legal texts. The translation of sentences containing the English modal 'shall' into Thai non-modal sentences also seems appropriate, given that the obligation can be inferred from the genre itself. We note, however, that such translations could constitute cases of implicitation, where 'implicitation' refers to the non-verbalization in a target text of information that was verbalized in the source text, but that the target-language addressee might be able to infer from the context or other

inferential source anyway (see Becher 2010, 2011). It is difficult to make generalizations about the modal strength of (non-modal) declarative sentences in the Thai translations, however, especially because they are also used to translate instances of the 'weaker' deontic obligation verbs 'will' (27 instances, or 26.7%) and 'should' (3 instances, or 2.4%), and even the deontic permission verb 'may' (13 instances, or 13%). One possible interpretation is that if non-modal declaratives are a common way of translating 'shall', then their slightly less common use to translate 'will' and infrequent use to translate 'should', may serve to elevate the obligation in the latter two cases.

A detailed discussion of the ให้ /hai/ causative form is beyond the scope of this article. Suffice it to say here that the placing of ให้ /hai/ at the beginning of a sentence creates a causative construction (Iwasaki 1998) in which one entity, the 'trigger' (ibid.), causes, enables or obliges another entity, the 'instigator' (ibid.) to carry out some action. The ให้ /hai/ causative can express different levels of obligation, from weak to strong, depending on the context, but we can argue that such causatives used in Thai legal texts are certainly not weak. This is because we can infer from the context that the trigger that demands the instigator to act is the law (treaty) itself. The translators' use of a ให้ /hai/ causative instead of a modal verb such as ต้อง /tong/ (shall)[16] suggests they consider that the use of the causative form elevates the degree of obligation in the same way as the modal verb 'shall' does. The Thai causative structure as used in translated legislative texts is also performative and somewhat imperative because it indicates that a command is being issued. According to Palmer (1986, 108), the imperative is not necessarily stronger or weaker than the strong modal verbs, however, because it is presented only as a deontic proposition and it is the hearer who has to judge the force of his or her obligation to act from the circumstances. This makes is difficult to compare directly the modal strength of imperatives and modal verbs, but we might argue, as Becher (2011: 43-44) does, that the illocutionary force of imperatives and certain deontic modals is more or less the same.[17]

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[16] Here we consider ต้อง /tong/ to be the closest equivalent of 'shall', as, within the context of legal translation at least, and based on the personal experience of one of the authors, it is the form that many translators are required to use to translate the deontic modal 'shall'.
[17] Becher (ibid.) also argues that imperatives are more explicit than modals such as 'must', given the polyfunctionality of such modals, as referred to earlier. He does not take into account however, the fact

In a further 93 instances or 29% of cases, the modal 'shall' is translated by the Thai modal จะ /ja/ (will). The word จะ /ja/ in Thai is often translated as 'will' in English and behaves similarly to 'will' both syntactically and semantically (Srioutai 2004, 100). Similarly to 'will', จะ /ja/ (will) can stand for the future tense, but it is also compatible with expressions of different types of modality, including deontic necessity and deontic possibility, as argued by Srioutai (2004). This claim is relevant to the use of จะ /ja/ (will) in our parallel corpus, which involves deontic necessity in the future.[18] The use of จะ /ja/ (will) as a deontic modal does not necessarily make the obligation less intense.

Another 45 instances (14%) of 'shall' are translated into Thai by จะต้อง /ja/+/tong/ (will+must). As previously mentioned, จะต้อง /ja/+/tong/ is an example of a serial verb in Thai, and given that English lacks such structures, Tirkkonen-Condit (2002, 2004) would consider it a 'unique item' from the point of view of English to Thai translation. It is important to note here that Tirkkonen-Condit's (2004) argument is not that such items are untranslatable, but simply that they are not "similarly manifested (e.g. lexicalized) in other languages" (ibid., 177). Tirkkonen-Condit (2004, 177-178) goes on to hypothesize that such unique items will be underrepresented in translated texts compared to non-translated texts in the same language simply because they "do not readily suggest themselves as translation equivalents, as there is no obvious linguistic stimulus for them in the source text." . Our analysis so far has shown that จะต้อง /ja/+/tong/ is definitely attested in translation from English into Thai, but not whether it is underrepresented in Thai. We return to this issue when we discuss 'textual fit' below.[19]

Contrary to expectation, we find only 35 instances (11%) of ต้อง /tong/ (shall/must/have to) as translations of 'shall' in our corpus. Finally, we note 13 instances (4%) where the weaker deontic obligation modal ควร /khuan/ (should) is used and two instances (0.6%) where the weaker deontic permission modal อาจ /aat/

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that 'must', while ambiguous in isolation, is often not at all ambiguous in context, and is certainly not ambiguous in the example he himself provides.

[18] Palmer (1998, 97) explains that deontic modal verbs are performative and always related to the future because only the future can be changed or affected as a result of them being expressed.

[19] For a critique of Tirkkonen-Condit's (2002, 2004) concept of unique items, see, for example, Chesterman (2007) and Kenny and Satthachai (in press).

(may) is used. 'Shall' is thus the only modal verb in our corpus where a weakening of modal strength occurs in translation, but at 4.6% of instances, this is a marginal phenomenon.

In the case of our other two obligation modals, we see that translations of 'should' and 'will' are somewhat more predictable than translations of 'shall' with 84% of instances of 'should' translated, as expected, by ควร /khuan/ and 66% of 'will' translated, again as expected, using จะ /ja/. Having said that, other translations of 'should' and 'will' elevate the deontic obligation in 11% and 7% of cases, respectively, and the use of non-modal declaratives in just over one quarter of instances also complicates the analysis for 'will', as described above.

Likewise, with verbs of deontic permission, the majority (64%) of instances of 'may' are translated as expected by อาจ /aat/, while 10% are translated by another deontic permission modal, namely สามารถ /sa-mart/ (can). Nine instances of 'may' (9%) are translated into expressions of deontic obligation in Thai, however, thus elevating the modal strength, and non-modal declaratives are also used to translate 13% of instances. Likewise, ten out of twelve instances of 'can' are translated, as expected, by สามารถ /sa-mart/ while the other two are translated by the Thai causative structure and the obligation modal จะ /ja/ (will), marking a shift from permission to obligation.

Summing up, just over 31% of instances of English deontic modals in our sample are translated in a way that diverges syntactically from the source text, with non-modal declaratives accounting for 20.63% of these cases, and the Thai causative for a further 10.62%, but the semantic component of obligation remains intact in these instances, and the strength of the obligation seems undiminished, although comparisons of 'modal strength' are problematic here, for the reasons outlined above. As already indicated, we are on safer ground comparing the strength of obligation modals with each other, or of obligation modals with permission modals. Restricting ourselves to such comparisons, we note that modal strength is reduced in just under 2.28% of cases in our sample, and increased in just under 4.86%.

Textual Fit

Our comparison between translated and the non-translated Thai found that five out of six Thai modal verbs investigated were overrepresented in the translations, echoing

Biel's (2014, 289) finding that obligation modals are overrepresented in Polish legislative translations.[20] Biel explains her finding in terms of interference from source texts. There is good reason to believe that our source texts are an influencing factor in the present study too. If we consider again the fact that there are 4,337 modal verbs in our 172,739 word English corpus (see Tables 2 and 3), then we would expect to see 25,107 modal verbs in a one-million-word corpus of legislative texts in English. Our Thai monolingual corpus (with 1,173,485 words), by way of contrast, contains 12,421 modal verbs (summed from the values in Table 10), or just under 10,585 per million words. Modal verbs are thus nearly 2.5 times more frequent in the English source texts in our corpus than they are in our non-translated Thai legislative texts.[21] Our translations into Thai (222,556 words) occupy an intermediary position, with 3,977 modals in all (again, summed from the values in Table 10), or 17,869 per million. Thus although Biel (2014, 289) claims that the translators represented in the parallel corpus she uses rarely strive to adjust to the norms of national legislation, it seems as if our Thai translators are actually steering a middle course between English and Thai distributions of modal verbs. Indeed, they end up close to halfway between the norms for the two languages. We may speculate that the Thai translators are somewhat freer to move towards target-language norms precisely because, unlike the translators of the EU legislation addressed by Biel (2014), their translations are not 'authentic' in the sense described earlier (see also Dullion 2000; Garzone 2000).

Moving beyond these broad generalizations, it is still remarkable that the Thai modal verbs studied here are *so* much more frequent in translated than in non-translated Thai. We know already that sentences with modal verbs are in complementary distribution with other structures, for example non-modal declarative and causative sentences, in the Thai texts in our parallel corpus. This is, of course, also true of our monolingual Thai corpus, but we have not established the precise distribution for anything but instances of translations of selected English modal verbs. It is possible that that the distribution in Thai translations is skewed by virtue of the source language "shining through", to use Teich's (2003) term, and that, for example, non-

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[20] Again like Biel (2014), we find that this effect is much reduced in the case of deontic verbs of permission.
[21] Even if we allow for the fact that a small number of these English modals are epistemic (137 would be both an accurate and convenient estimate), we would still have 4,200 deontic modals in our English corpus, equivalent to 24,314 deontic modals per million words. We have no reason to believe that similar adjustments to the count for the Thai texts would change this ratio to any great extent.

modal declaratives and causatives are more commonly used in non-translated Thai than in translated Thai, but we have yet to systematically pursue this line of inquiry. What is already clear however is that the serial modal verb จะต้อง /ja/+/tong/ (will+must) is very much indicative of Thai legislative translation (with a log likelihood score of 585.15); rather than being underrepresented, as Tirkonnen-Condit's (2002, 2004) unique items hypothesis would predict, it is overrepresented in Thai legislative translation. This finding might suggest that translated legislation as a genre is subject to textual-linguistic norms (Toury 1995: 58-59) that transcend language typological differences. The higher than expected frequency of other Thai modals in translation can also be partly explained by the fact that translations of 'shall', which is by far the most common modal in the English source texts, are so variable. Translations of 'shall' contribute, for example, to the high frequencies of จะ /ja/ (will) and even ควร /khuan/ (should). Likewise, the frequency count for อาจ /aat/ (may) in the translations is elevated not just by the fact that this modal is used to translate nearly two thirds of instances of 'may', but also by its use to translate a range of other English modals including 'shall', 'could', 'can', 'might' as well as instances of the simple present (with no modal verbs). A full description of deontic modality in Thai translation would have to take account such many-to-many translations, and would need to approach the issue in both directions: from English to Thai, and from Thai to English, as well as making comparisons between translated and non-translated Thai. So far we have approached our study from just two of these three angles. Finally, it is ironic that what we considered to be the most obvious translation of 'shall', namely ต้อง /tong/, accounts for only 11% of translations of 'shall', and is underrepresented in Thai legislative translation compared to Thai non-translated legislation. We can only speculate here that it is somehow displaced by competing modals that have become more indicative of translated legislation in Thai.

Conclusions

This article examines how English deontic modal verbs are translated into Thai, and how translated Thai compares with non-translated Thai in the context of legislative translation. Our broad findings are that the translation of English modals into Thai shows more variability than we might have imagined, and that 31% of such modals

are translated using resources other than modals in Thai. Given the use non-modal declaratives to translate around 20% of forms, obligation can sometimes become implicit rather than explicit in Thai translation. Shifts in modal strength occur, but are relatively rare at just over 2% for decreases and just under 5% for increases. Modal verbs turn out to be overrepresented in translation into Thai compared with non-translated Thai, and we found no evidence to support the unique items hypothesis.

The study is limited by the fact that causatives and non-modal declarative structures that indicate obligation or permission have not yet been systematically studied, and that full explanations have yet to be arrived at for the distribution of modal forms in Thai. Such explanations would benefit from reversing the direction of the analysis, and proceeding from Thai into English. Nor have we considered the effects of sub-genres. Finally, we see that there is a certain irony in claiming that corpus-based legal translation studies are dominated by European languages, and then proceeding to use these same European studies to orient our own study of Thai legal translation, but given the dearth of relevant prior studies in Thai, we considered the European studies cited earlier as constituting useful sources of hypotheses about what might happen in legislative translation into Thai, and also as providing models for semantic/pragmatic cross-linguistic comparisons (involving modality in this particular case). Further research could, however, extend beyond the features we have looked at in this and other sources (Kenny and Satthachai, in press; Satthachai, Forthcoming 2019) to include features that might be considered to be more indicative of the specificity of translation from English into Thai, rather than focusing on common ground with legislative translation in European contexts. It would be interesting to investigate instances of linguistic or cultural adaptation of legal concepts and terms, for example, in translation into Thai, if such instances exist. In future research, we hope to pursue these ideas.

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Appendix 1: List of texts in our parallel corpus

(Note: the total word counts reported here differ from those reported in the body of the article as the word counts in this Table are provided by Microsoft Word based on Microsoft's proprietary word tokenizers for English and Thai, whereas the word counts reported in the body of the article are based on the tokenizers used by Sketch Engine.)

	English Name	Year	No. of words	Thai Name	No. of words
1.	Charter of The ASEAN	2007	5,036	กฎบัตรอาเซียน	6,090
2.	ASEAN Human Rights Declaration	2012	2,423	ปฏิญญาอาเซียนว่าด้วยสิทธิมนุษยชน	2,908
3.	International Convention on Civil and Political Rights – ICCPR)	1976	6,849	กติการะหว่างประเทศว่าด้วยสิทธิพลเมืองและสิทธิทางการเมือง	7,468
4.	International Convention on Economic, Social and Cultural Rights – ICESCR)	1976	3,573	กติการะหว่างประเทศว่าด้วยสิทธิทางเศรษฐกิจ สังคม และวัฒนธรรม	3,831
5.	Convention of the Elimination of All Forms of Discrimination against Women	1979	4,328	อนุสัญญาว่าด้วยการขจัดการเลือกปฏิบัติต่อสตรีในทุกรูปแบบและพิธีสารเลือกรับของอนุสัญญาว่าด้วยการขจัดการเลือกปฏิบัติต่อสตรีในทุกรูปแบบ	5,243
6.	Convention on the Rights of the Child	1989	7,410	อนุสัญญาว่าด้วยสิทธิเด็ก	8,540
7.	Convention on the Elimination of all Forms of Racial Discrimination – CERD	1969	4,643	อนุสัญญาระหว่างประเทศว่าด้วยการขจัดการเลือกปฏิบัติงเชื้อชาติในทุกรูปแบบ	5,247

8.	Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment	1990	5,230	อนุสัญญาต่อต้านการทรมานและการประติบัติหรือการลงโทษที่โหดร้ายไร้มนุษยธรรมหรือที่ย่ำยีศักดิ์ศรี	6,395
9.	Convention on the Rights of Person with Disabilities	2006	9,565	อนุสัญญาว่าด้วยสิทธิคนพิการ	11,505
10.	International Convention for the protection of All Persons from Enforced Disappearance	2006	6,941	อนุสัญญาระหว่างประเทศ ว่าด้วยการคุ้มครองบุคคลทุกคนจากการหายสาบสูญโดยถูกบังคับ	7,594
11.	Universal Declaration of Human Rights	1948	1,759	ปฏิญญาสากลว่าด้วยสิทธิมนุษยชน	2,106
12.	Convention on International Trade in Endangered Species of Wild Fauna and Flora	1975	6,692	อนุสัญญาไซเตส	7,694
13.	United Nations Framework Convention on Climate Change	1992	8,114	อนุสัญญาสหประชาชาติว่าด้วยการเปลี่ยนแปลงสภาพ	9,942
14.	Kyoto Protocol to United Nations Framework Convention on Climate Change	1997	8,278	พิธีสารเกียวโต	9,671
15.	Convention on Biological Diversity	1992	7,859	อนุสัญญาว่าด้วยความหลากหลายทางชีวภาพ	9,640
16.	Double Tax Agreements with Thailand (45 countries)	(1992-2010)	11,032	อนุสัญญาภาษีซ้อน	12,970
17.	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1989	8,496	อนุสัญญาบาเซล	10,035

18.	United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa	1994	10,052	อนุสัญญาสหประชาชาติว่าด้วยการต่อต้านการแปรสภาพเป็นทะเลทรายในประเทศที่ประสบภัยแล้งอย่างรุนแรงและ/หรือการแปรสภาพเป็นทะเลทรายโดยเฉพาะในทวีปแอฟริกา	12,238
19.	Rotterdam Convention	1998	6,654	อนุสัญญารอตเตอร์ดัม	7,335
20.	Stockholm Convention on Persistent Organic	2001	8,982	อนุสัญญาสตอกโฮม	10,910
21.	Minamata Convention on Mercury	2013	10,818	อนุสัญญามินามาตะว่าด้วยปรอท	12,890
22.	Montreal Convention (Aviation)	1999	8,171	อนุสัญญามอนทรีออล	9,794
23.	International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families	1990	14,084	อนุสัญญาว่าด้วยการคุ้มครองสิทธิของคนงานอพยพและสมาชิกครอบครัว	15,255
24.	Convention Concerning the Protection of the World Cultural and Natural Heritage	1972	4,652	อนุสัญญาว่าด้วยการคุ้มครองมรดกโลกทางวัฒนธรรมและทางธรรมชาติ	5,546
25.	Convention on Protection of Children and Co-operation in respect of Intercountry Adoption	1993	4202	อนุสัญญาว่าด้วยการคุ้มครองเด็กและความร่วมมือเกี่ยวกับการรับบุตรบุญธรรมระหว่างประเทศ	4,490
	Total		175,816		205,337