The Readability of the
US Federal Income Tax System:
Some First Results

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1111 Constitution Ave,
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June 13, 2014

1.0 Introduction

- Idea is to apply how I make a living (evaluation and research) to tax system texts

- Observation: others generally do not enjoy being evaluated; examples include my students and the Pittsburgh local newspapers

- Goal is to interest Advisory Panel, SOI and Research into research about US tax system that can now be readily performed with publicly available records.
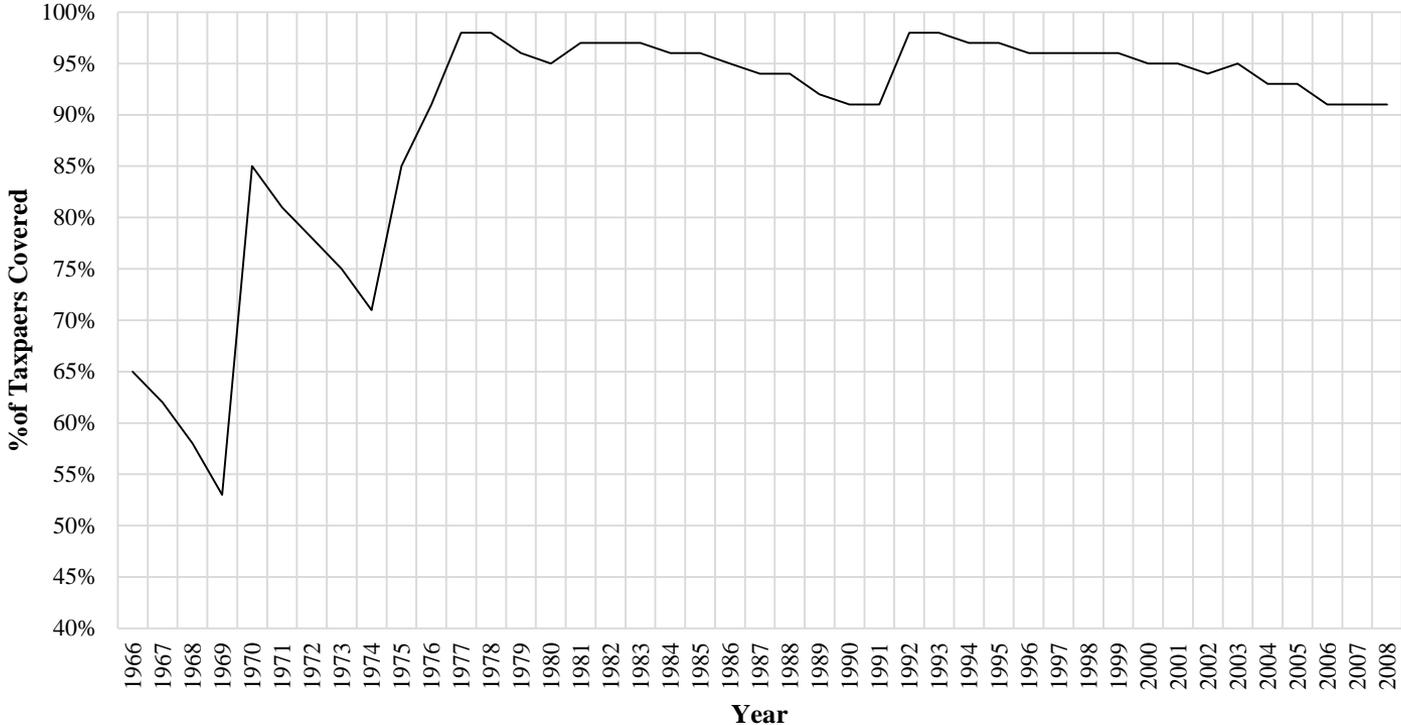
1.0 Plan of Remarks

Remarks organized as follows:

2] a personal federal form design history anecdote

3] two readability formulae, research questions & methodology,

4] the empirical results for income tax instructions

5] empirical results for IRC and US Code

6] summary and things yet to do

2.0 Personal Tax History Anecdote

- TRA 76 ➔ JCT 1976 Simplification Project
- Tax Table Coverage Increased from $15,000 to $40,000
- A Retrospective on Increasing Tax Table Coverage

Item	1975	1976	1977	1978
1040 Math Error Rate	8.90%	10.40% Δ=16.9%	6.44% Δ= -38.1%	6.87% Δ=6.7%
1040 Instructions Tax Table Last Taxable Income Entry	$15,000	$20,000 % Δ=33.3%	$40,000 % Δ=100%	$40,000 % Δ=0%
Percentile of Highest Entry for Tax Table Taxable Income /	85%	91% % Δ=7.1%	98% %Δ=7.7%	98% % Δ=0%

Fraction of Taxpayers Covered in 1040 Tax Table: 1966-2008

3.0 Two Readability Formulae

1) Fresch Reading Ease =
   206.835 – (1.015 x ASL) – (84.6 x ASW)

   where ASL =Σ Words/ Σ Sentences
             ASW = Σ Syllables/ ΣWords

90-100 : Very Easy
80-89   : Easy
70-79   : Fairly Easy
60-69   : Standard
50-59   : Fairly Difficult
30-49   : Difficult
0-29   : Very Confusing

3.0 Two Readability Formulae and Research Questions

2) Fresch-Kincaid Grade Level Score=

$$(0.39 \text{ x ASL}) + (11.8 \text{ x ASW}) - 15.59$$

where ASL =Σ Words/ Σ Sentences

ASW = Σ Syllables/ ΣWords

Questions: how do readability measures for 1140, 1120, and 1120S compare over time?

Methodology: Obtain PDFs, Acrobat➜MS Word 2010, Run Visual Basic Macro in MS Word 2010. Voila!

3.0 Two Implicit Text Standards: Gettysburg Address and US Constitution

Document	Words	Sentences	Flesch_ Reading Ease	Flesch-Kincaid Grade_Level
Gettysburg Address	271	10	67.1 "standard"	10.6
US Constitution (Including Amendments)	7,830	198	46.6 "difficult"	12.3

4.0 Results for Fresch Reading Ease 1040, 1120, 1120S Instructions: 1990-2012

FRE	1040	1120	1120s
Min	55.8	41.6	37.2
Q1	57.2	42.7	38.6
Mean	57.6	43.1	41.8
Median	57.4	43.1	42.7
Q3	58.0	43.9	44.5
Max	59.8	44.6	45.6
CV	1.5%	2.0%	7.1%

4.0 Results for Fresch-Kinkaid Grade Level Scores: 1040, 1120, 1120S Instructions: 1990-2012

FKG	1040	1120	1120s
Min	7.2	9.1	9.0
Q1	7.9	9.4	9.2
Mean	8.4	10.0	10.3
Median	8.7	10.0	10.5
Q3	8.9	10.6	11.4
Max	9	11.1	11.6
CV	6.8%	6.9%	10.3%

4.0 Pearson Correlation Coefficients (n=23) for Fresch Reading Ease Scores: 1990-2012

$*p < .05$ $**p < .01$ $***p < .001$

	Year	fre_1040	fre_1120	fre_1120s
Year	1	.09874	.39012	.86230***
fre_1040		1	.16685	.24651
fre_1120			1	.72758***
fre_11120s				1

4.0 Pearson Correlation Coefficients (n=23) for Fresch-Kincaid Grade Level Scores: 1990-2012

*p <.05 **p<.01 ***p<.001

	Year	fkg_10 40	fkg_1120	fkg_1120s
Year	1	-.39844*	-.71377***	-.81416***
fkg_1040		1	.63636**	.65399**
fkg_11120			1	.92262***
fkg_11120s				1

5.0 Mirror, Mirror on the Wall
Which US Code Title is the most readable of all?

US Code Title	Words	Sentences	Flesch Reading Ease	Flesch Kincaid Grade Level	Words/ Sentence
Internal Revenue Code Title 26	19,458,100	\ 196,175	45.6	9.8	99.2
US Code Titles (n=53)	Words	Sentences	Flesch Reading Ease	Flesch Kincaid Grade Level	Words/ Sentence
25%	163,696	7,303	34.5	10.9	22.0
Mean	986,225	31,710	38.0	11.5	28.0
Median	470,266	19,875	37.5	11.5	24.1
75%	1,073,446	42,668	40.7	12.2	26.6

6.0 Summary and Prospectus

Using 2 standard measures of readability,

- we conclude that:

The various income tax instructions are "fairly difficult" (individual) and "difficult" (corporate instructions); and

The reading grade level of individual income tax instructions is about 8th grade while the reading grade level of corporate income tax instructions is about 10th grade.

6.0 Summary and Prospectus

Also, we find:

the Internal Revenue Code is the largest single part of the US Code, in terms of words and sentences, but the readability is only "Fairly Difficulty compared to the rest of the US Code which is "Difficult" to read.

However, the grade level of reading of the IRC is about 1 year lower than the rest of the US Code.

6.0 Summary and Prospectus

We also find that in terms of words/sentence, the IRC is 4 times as verbose (99) vs. the median of the US Code (24).

Things to do include double checking the results, looking at the regulations, and prying loose and examining error rates by tax year and Code provision against readability measures.