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THE OPTIMAL CONVERSION OF A TRADITIONAL IRA TO A ROTH IRA  
ACCOUNTING FOR THE EFFECTS OF A TAX TORPEDO

IAN REYNOLDS HAMSHER  
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Reviewed and approved\* by the following:

Brian Davis  
Professor of Finance  
Thesis Supervisor  
Honors Adviser

Louis Gattis  
Professor of Finance  
Faculty Reader

\* Signatures are on file in the Schreyer Honors College.

## ABSTRACT

This paper and the model attached is to answer an individual's question of, "Is it optimal for me to convert my Traditional IRA to a Roth IRA?" The first chapter of this paper discusses retirement. It goes into how many people do not plan for retirement correctly especially since people are living longer. The second chapter of this paper dives into individual retirement accounts (IRA's). It goes into explaining how they are beneficial for an individual to plan for retirement and talk about the rules and regulations along with the difference between a Roth IRA and a Traditional IRA. The last part of this chapter talks about the Roth IRA conversion and the benefits and drawbacks from it. The third chapter of this paper discusses a tax torpedo. This is the most important differentiate between my model and other models out there. A tax torpedo is a phenomenon that occurs and makes your marginal tax rates higher than expected in retirement which can affect if you want to convert to a Roth IRA. The fourth chapter is the explanation of my model. It goes into describing how it works, what it finds, and how it is different. Lastly, this paper acknowledges that this is not the end of this research and discusses the different ways this model can help future research.

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## Chapter 1

### **Introduction**

Retirement is an incredibly important issue that is frequently discussed in today's society. It is one of those phases in life that is inevitable and marks the end of our professional careers that we have constantly worked hard at. You get to replace working on assignments and meeting deadlines with pursuing new hobbies and spending more time with family and friends. While many people are excited about this post career, more relaxing time that they deserve, some are also gripped with the fear of losing a steady source of income. That is why it is necessary for every person to prepare their finances in the correct way especially when looking forward at retirement. There are plenty of reasons why retirement planning is important and why it can never be too early to start saving.

There are a few risks that can impact financial security in retirement, the first one I am going to talk about is longevity. In today's society, people are generally enjoying more healthy active retirements than prior generations. However, what does a longer life mean for your retirement savings? In general people view living longer as good news however, this may cause financial strain since your retirement money will need to last longer.

As the graphic below (Figure 1) illustrates, there is a 75 percent chance that a 65-year-old man today will live to age 81 and a woman to age 82. It also shows that a 65-year-old couple has a 75 percent chance that one of them will live to age 89, and a one-in-four chance that one will live to nearly 100 (*Retirement Income*).

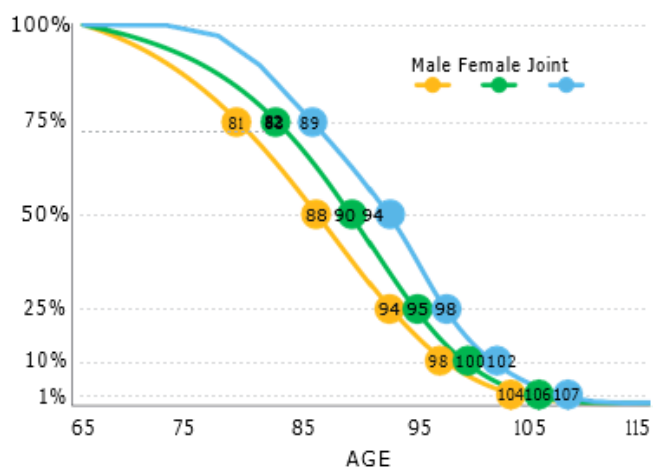


Figure 1: Probability of Life Expectancy

As Figure 1 shows, people are expected to live for a much longer time, and there is over a two-decade difference for how long someone will live. If you are planning on saving for retirement expecting yourself to only live to 81 but you end up living through 107, stretching your finances will be incredibly tough. Because of this, it is important to plan for longevity, as in, plan for the possibility that you may need your income well into your 90's or longer. This should give you a buffer in case you live longer than you expect. If your finances outlive you, they can then be used as a nice buffer for your family and friends (*Retirement Income*).

The second risk I am going to talk about is taxes and inflation. Both of these can take a huge bite out of your retirement savings if you do not plan correctly. Inflation can take a bite by reducing your purchasing power, as shown in the graphic below (Figure 2), and taxes can reduce your income leaving you with less money to spend. When planning for retirement you should definitely include options that help protect your assets from the rising cost of everyday goods and from increasing taxes.



Years	Inflation Rate		
	3%	4%	5%
0	\$100,000	\$100,000	\$100,000
5	\$86,261	\$82,193	\$78,353
10	\$74,409	\$67,556	\$61,391
15	\$64,186	\$55,526	\$48,102
20	\$55,368	\$45,639	\$37,689
25	\$47,761	\$37,512	\$29,530
30	\$41,199	\$30,832	\$23,138

**Table 1: Impact of Inflation on Your Retirement Income**

The last risk associated with financial security in retirement that I am going to talk about is health care costs and long-term care costs. Over the past few years health care costs have risen dramatically and that is not going to stop anytime soon. You need to plan in order to meet future medical costs, especially those expenses that are not covered by Medicare. Planning in advance can defiantly help you minimize the damage that an unexpected health care need may have on your financial savings. Even though you cannot control how quickly health care costs are going to rise in the future, you can make a plan to financially cover health related expenses that are more likely to increase as you age. The graphic below is from [www.medicare.gov](http://www.medicare.gov) and it shows how your health can have a huge financial cost to it (Sightings).

Life has never been, and will never be predictable especially when it comes to your health. Chronic illnesses, disabling conditions, etc. can happen at any time. These long-term care issues can quickly deplete your financial savings especially since long-term care services are usually not covered by Medicare or private health insurance. If you plan ahead, they can ensure that they have the financial stability to cover an unprecedented event/illness (Sightings).

Health	Low	High
Very Good - Excellent	\$3,000	\$5,000
Good - Fair	\$5,000	\$7,000
Poor	\$7,000	\$10,000

**Table 2: Estimated Annual Out-Of-Pocket Health Care Expenses in Retirement**

A 2014 Nationwide survey of pre-retirees and retirees aged 55 to 75 found that “health care and long-term care expenses together account for between 12 and 15 percent of retirement expenses, depending on the household income. If long-term care costs increased 5 percent each year, an eight-hour-a-day home health aide who was paid \$63,831 per year in 2014 would command \$275,875 in 2044” (*Retirement Income*).

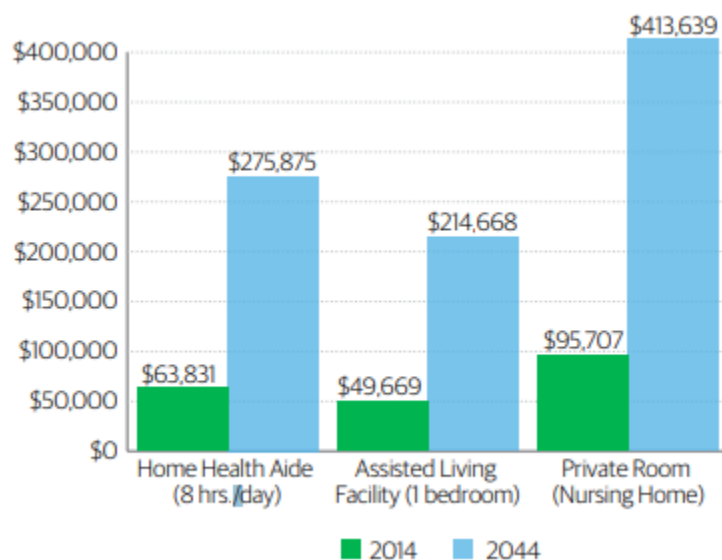


Figure 2: 2014 vs. Projected Annual Cost of Long-Term Care

## Chapter 2

### **Individual Retirement Accounts**

As mentioned in Chapter 1, saving for retirement is incredibly important, and leaving it up to your employer to set up an account for you may not always make the most sense. Taking control of your own destiny and financial security is vital and lucky there are a few different options that an individual can take advantage of. The two main options are a Traditional Individual Retirement Account (IRA), or a Roth Individual Retirement Account (IRA). Both of these are accounts that an individual can set up himself on any broker such as Ally, E\*Trade, Scottrade, etc.

### **Rules and Regulations in Individual Retirement Accounts**

Individual retirement accounts, known as IRAs, are, more or less, savings plans with a multitude of restrictions. The primary advantage of an IRA is that you can choose whether on how they want taxes affecting their earnings and growth of their savings. The primary disadvantage or IRA's is that penalties are imposed if you have to withdraw any of the funds before you reach 59 1/2. There are, however, several types of IRAs, each of which has its own eligibility requirements and tax implications (Perez).

The maximum amount you can contribute to a Traditional or a Roth IRA each year is limited to \$5,500 as of 2018, which does include any combination if you wanted to contribute to both. This contribution maximum has remained the same since 2013, when it increased from the

\$5,000 maximum that was put in place in 2012. However, if you are past the age of 50 years old, you can contribute up to an extra \$1,000. This is known as a catch-up contribution and stays at \$1,000 every year. All of these contribution limits apply across both traditional and Roth IRA types. If you want to contribute to both a traditional IRA and a Roth IRA, you can contribute any combination of funds to each, however the combined total can't exceed the annual limit of \$5,500. For example, you might put \$2,750 into a traditional IRA and another \$2,750 into a Roth IRA (Perez).

## **Advantages and Disadvantages of a Traditional IRA**

### **Advantages of a Traditional IRA**

- 1) You claim a tax deduction when you contribute money to a Traditional IRA. Since this deduction reduces your taxable income, you won't pay income tax on the money you set aside in the account.
- 2) The savings in your account grow tax-deferred. You won't have to include dividends, interest, or capital gains on your annual tax return.
- 3) When you withdraw the money, the withdrawal from the IRA is included in your taxable income, and it is taxed as ordinary income. Effectively you are paying taxes later on money you earn today. There are many retirees who find themselves in lower tax brackets than they were subject to when they were working in their careers. This may help you end up paying less of a tax rate on that money.

## **Disadvantages of a Traditional IRA**

- 1) If you decide you need the money earlier than 59 ½ you will have to pay income tax on the money as well as a penalty. The penalty is an additional 10-percent tax penalty on that early distribution.
- 2) You are required to begin withdrawing money from a Traditional IRA beginning in the year you reach age 70 1/2. This is called the required minimum distribution or "RMD" each year. If you fail to withdraw the minimum distribution you will be hit with an excise tax of 50 percent of the RMD amount you didn't pay regular income tax on because you didn't withdraw the money.
- 3) There are some restrictions on Traditional IRA's as to who can take a deduction for contributions. For example, if you or your spouse are covered by a retirement plan at your firm, your deduction may be restricted, or you may not be able to deduct any of your contribution at all.

## **Key features of a Roth IRA**

A Roth IRA provides potentially tax-free savings and distributions. Unlike a Traditional IRA, you do not get a deduction for your contributions when you make them. However, there are potential huge tax benefits when you withdraw in retirement (Spors).

- 1) Your contributions are not tax-deductible.
- 2) You don't have to pay income tax on the earnings and growth of the savings inside a Roth IRA.
- 3) If you meet certain conditions, distributions from a Roth IRA are completely tax-free.

- 4) Even if you are covered by a retirement plan at work, you can contribute to a Roth IRA.
- 5) Roth IRAs have some income limitations.
  - a. “If you are single, you must have a modified adjusted gross income under \$135,000 to contribute to a Roth IRA for the 2018 tax year, but contributions are reduced starting at \$120,000. If you are married filing jointly, your MAGI must be less than \$199,000, with reductions beginning at \$189,000.”
- 6) Required minimum distribution rules don't apply to Roth IRAs.

### **Traditional IRA to Roth IRA Conversion**

There are many benefits to a Roth IRA however, one of the primary benefits is that you don't pay income tax when you withdraw your funds in retirement. Unfortunately, not everyone meets the standards required to contribute to a Roth IRA. The main reason an individual is not allowed to contribute is because his/her income exceeds the Roth IRA income limits. Because of this, it makes sense to look into converting a Traditional IRA to a Roth IRA (*Roth IRA*).

Certain individuals were always allowed to convert their Traditional IRAs to Roth IRAs as long as they met specific qualifications set by the IRS and paid tax on the conversion. However, until recently, high-income earners were unable to convert since the IRS required your income to be less than \$100,000 in order to convert. Now that the cap is removed, high-income earners are now able to convert as long as they pay the required income tax on the conversion (*Roth IRA*).

## **Roth IRA Conversion Taxes**

Converting a Traditional IRA to a Roth IRA, is a process also known as “creating a backdoor Roth IRA.” During this process you will have to pay income tax on the contributions. Sometimes you have to look into the actual taxes of your conversion however. Since the taxable amount that was converted is added to your income taxes, then your regular income rate is applied to your total income. Due to this, if the amount is large enough, for the year of the conversion it may raise your tax bracket for the year, which may make the conversion not profitable. At the same time, if the money in your Traditional IRA is post tax you may not have to pay any taxes when you convert to a Roth IRA. This is something that needs to be thought about if from the get go you know you want to do a conversion at some point in the future (*Roth IRA*).

## **Why Convert to a Roth IRA?**

The main reason someone wants to convert the money is because they want to pay as little in taxes as possible. Pretty much any savvy investor wants to hold on to their hard-earned money so they can decide what they want to do with it. Sometimes, converting to a Roth IRA allows you to make smart tax moves that will save money in the long run. One of the best times for a conversion is if you anticipate your income dropping significantly in a certain year with it bouncing back after that (*Roth IRA*).

A good idea would be to plan a conversion for the low-income year because you may be in a lower tax bracket during your conversion. Similarly, and this is something to always follow,

if the government announced tax-rate decreases to go into effect in the following year, a conversion in that year would save income tax (*Roth IRA*).

One of the best reasons to convert to a Roth IRA is knowing that you will owe no additional income tax on the converted funds. This is definitely stress reliever for people looking forward to their retirement. The balance that you see in your Roth IRA portfolio will be the exact amount you can tap into in retirement. You won't have to calculate any future taxes and how that affect your balance and financial security (*Roth IRA*).



## Chapter 3

### **Tax Torpedo**

In 2015, according to the United States Social Security Agency, approximately 62 percent of aged beneficiaries received at least half their income from social security (*Fast Facts*). This goes to show that it is incredibly important to understand how Social Security works especially if their objective is to maximize post tax benefits.

This chapter explains the phenomenon called a tax torpedo. A tax torpedo refers to the sharp increase and then sharp decrease in one's marginal tax rates which is caused by the taxation of Social Security benefits. This may cause some middle-income households' marginal rates to be upwards of 100% of their tax bracket. Marginal tax rate is the taxes paid on the next dollar of income. The United States has a progressive tax rate structure, so that someone with a low-income level has a low marginal tax rate, but as income rises so does the marginal rate (Meyer and Reichenstein).

### **Rules Affecting Taxation of Social Security**

There are many rules and regulations that go into the taxation of Social Security. At the highest level, the taxation of Social Security benefits is contingent on the level of provisional income, also called combined income. The equation for provisional income is as follows:

$$\text{Provisional Income} = \text{Modified Adjusted Gross Income (MAGI)} + \text{Tax Exempt Interest} + 50\% \text{ of Social Security Benefits}$$

For a majority of those near retirement and retirees, MAGI includes everything in adjusted gross income (AGI) except for the taxable portion of Social Security benefits. This taxable portion is the minimum of three equations:

- (1) 85% of Social Security benefits
- (2) 50% of provisional income between the two income threshold levels plus 85% of provisional income beyond the second income threshold level
- (3) 50% of benefits plus 85% of provisional income beyond the second income threshold level.

The first- and second-income threshold levels are \$25,000 and \$34,000 for singles, qualifying widowers, and married couples filing separately. The first- and second-income threshold levels for couples married filing jointly are \$32,000 and \$44,000. These income threshold levels are not indexed for inflation (Meyer and Reichenstein).

### **Income Ranges Affected by the Tax Torpedo**

The table below presents the 2018 MAGI income levels within which the tax torpedo applies to single individuals. The first column is the individuals annual Social Security benefit. The second column is the beginning of the tax torpedo. It is either the larger of where provisional income reaches \$25,000 or the level of MAGI where taxable income equals zero. The third column is the second threshold of the tax torpedo. It is when provisional income equals \$34,000. The last column represents the ending provisional income where 85% of Social Security benefits are taxed (Meyer and Reichenstein).

MAGI Ranges within which the Tax Torpedo Applies to Single Filers			
Annual Social Security Benefit	Beginning of the Torpedo	Second Threshold of the Torpedo	Ending Income
\$10,000	\$20,000	\$29,000	\$33,706
\$15,000	\$17,500	\$26,500	\$36,206
\$20,000	\$15,000	\$24,000	\$38,706
\$25,000	\$13,233	\$21,500	\$41,206
\$30,000	\$12,400	\$19,000	\$43,706
\$35,000	\$11,567	\$16,500	\$46,206
\$40,000	\$10,733	\$14,000	\$48,706

**Table 3: 2018 MAGI Income Levels for Single Filers**

For example, looking at this table above, consider someone whose annual social security benefit is \$20,000. For them, the beginning of the torpedo occurs when provisional income equals \$25,000. This is at a MAGI of \$15,000 since:

$$\begin{array}{l} \text{Modified Adjusted} \\ \text{Gross Income (MAGI)} \end{array} = \$25,000 - (50\%)(\$20,000) = \$15,000$$

The second threshold of the tax torpedo occurs when provisional income equals \$34,000.

This is a MAGI of \$24,000 since:

$$\begin{array}{l} \text{Modified Adjusted} \\ \text{Gross Income (MAGI)} \end{array} = \$34,000 - (50\%)(\$20,000) = \$24,000$$

At \$38,706 is where 85% of Social Security benefits are taxed.

When annual Social Security benefits are \$25,000 or higher, the beginning of the torpedo is where taxable income reaches \$0. For example, if annual Social Security benefits are \$30,000, then a MAGI of \$12,400 would produce a provisional income of \$27,400. The portion of Social Security benefits included in AGI would be \$1,200, and AGI would be \$13,600, which would be offset by the \$13,600 standard deduction for a retiree over age 65. 2018 Standard deduction is \$12,000 plus an additional \$1,600 if you are 65 years or older (Meyer and Reichenstein).

$$\begin{array}{l} \text{Social Security} \\ \text{Benefits} \end{array} = (50\%)(\$27,400 - \$25,000) = \$1,200$$

$$\begin{array}{l} \text{Average Gross} \\ \text{Income} \end{array} = \$1,200 + \$12,400 = \$13,600$$

Because the tax torpedo refers to the bump in marginal tax rates as income rises, the rise in MAGI from \$10,000 to \$12,400 for this individual receiving \$30,000 in Social Security benefits is “not considered part of the tax torpedo, even though each dollar of income between \$10,000 and \$12,400 would cause an extra \$0.50 of Social Security to be included in AGI.” The table below presents the 2018 MAGI income levels within which the tax torpedo applies to married couples who are filing jointly (Meyer and Reichenstein).

<b>MAGI Ranges within which the Tax Torpedo Applies to Married Filing Jointly</b>			
<b>Annual Social Security Benefit</b>	<b>Beginning of the Torpedo</b>	<b>Second Threshold of the Torpedo</b>	<b>Ending Income</b>
\$20,000	\$25,067	\$34,000	\$46,941
\$25,000	\$24,233	\$31,500	\$49,441
\$30,000	\$23,400	\$29,000	\$51,941
\$35,000	\$22,567	\$26,500	\$54,441
\$40,000	\$21,733	\$24,000	\$56,941
\$45,000	\$20,900	\$21,500	\$59,441
\$50,000	\$19,865	\$19,865	\$61,941
\$55,000	\$18,716	\$18,716	\$64,441
\$60,000	\$17,568	\$17,568	\$66,941

**Table 4: 2018 MAGI Income Levels for Married Filing Jointly**

For a married couple that files jointly, that receives \$40,000 in annual Social Security benefits, there are no taxes on their first \$21,733 of MAGI. Income that is between \$21,733 and \$24,000 has a marginal tax rate that is 150 percent of their tax bracket. For income between \$24,000 and \$56,941, their marginal tax rate is 185 percent of their tax bracket (Meyer and Reichenstein).

For a married couple with annual Social Security benefits of \$50,000, there are no taxes on their first \$19,865 of MAGI. At this point, their provisional income already surpasses the

second income threshold level of \$44,000. Therefore, for MAGI between \$19,865 and \$61,941 their marginal tax rate is 185 percent of their tax bracket (Meyer and Reichenstein).

## Chapter 4

### Model

This chapter of the Thesis is an explanation of the model that I have built. The basis of this model is for an individual to plug in their personal data, and find out if it is optimal for them to convert their Traditional IRA to a Roth IRA. The model is comprised of 6 excel sheets, with the first two being the only two that are edited by the individual. All in all, the model is comprised of three parts, the first being the individual's current financial information along with current federal data, the second being the individuals expected retirement information, and the third being the culmination of the previous two parts and the outcomes the model presents.

#### Part 1

The first part of this model deals with an individual's current financial information. As Table 5 shows below, an individual must put in their current income for this year, their age, their Traditional IRA balance, how much they plan on converting to a Roth IRA, their current retirement growth rate, and if they are filing taxes either singles or married.

Current Data	
Income	\$50,000.00
Age	55
Traditional IRA Balance	\$800,000.00
Roth IRA Conversion Amount	\$500,000.00
Growth Rate	7.00%
Filing Taxes	Single Filers -or- Married Filing Separately

Table 5: Individual's current financial information

Along with the individual’s current financial information, they must update the federal data as well as shown in sheet 2 of the model (Tables 6,7,8,9 below).

Taxable Income		Single Tax Calculations		
From	To	Rate	Amount Over	Plus
\$0	\$9,700	10%	\$0	\$0.00
\$9,701	\$39,475	12%	\$9,700	\$970.00
\$39,476	\$84,200	22%	\$39,475	\$4,543.00
\$84,201	\$160,725	24%	\$84,200	\$14,382.50
\$160,726	\$204,100	32%	\$160,725	\$32,748.50
\$204,101	\$510,300	35%	\$204,100	\$46,628.50
\$510,301	∞	37%	\$510,300	\$153,798.50

Table 6: 2019 Tax Brackets for an Individual Filing Single

Taxable Income		Married Tax Calculations		
From	To	Rate	Amount Over	Plus
\$0	\$19,400	10%	\$0	\$0.00
\$19,401	\$78,950	12%	\$19,400	\$1,940.00
\$78,951	\$168,400	22%	\$78,950	\$9,086.00
\$168,401	\$321,450	24%	\$168,400	\$28,765.00
\$321,451	\$408,200	32%	\$321,450	\$65,497.00
\$408,201	\$612,350	35%	\$408,200	\$93,257.00
\$612,351	∞	37%	\$612,350	\$164,709.50

Table 7: 2019 Tax Brackets for an Individual Filing Married Jointly

The above two charts are the 2019 tax brackets for an individual who files either single or married jointly. One may need to adjust these brackets and rates if the federal government adjusts these in the coming years.

Taxable SS Limits 2019		
Single	Married	Rate
\$25,000	\$34,000	50%
\$32,000	\$44,000	85%

Table 8: 2019 Taxable Social Security Limits

The above chart is the 2019 taxable Social Security limits and the rate they are taxed.

Filing Status	Single Filers -or- Married Filing Separately	Married filing jointly or qualifying widow
Personal Exemption	\$0	\$0
Standard Deduction	\$12,200	\$24,400

Table 9: 2019 Personal Exemptions and Standard Deductions

The above chart is the 2019 personal exemptions and standard deductions for single filers and individuals married filed jointly. Social Security limits and the rate at which they are taxed.

## Part 2

The second part of this model is the individuals expected retirement information. This is the part of my model that differs the most from all other models. Most other models have the individual input their own expected retirement tax rate, however because of the tax torpedo that we talked about in Chapter 3, we notice that individuals tend to underestimate this rate. Therefore, we have individuals put in other metrics seen in Table 10 below, and we calculate their expected retirement tax rate for them.

Expected Retirement Data	
Expected Retirement Age	65
Social Security Benefit	\$10,000
Taxable Income	\$35,000
Non-Taxable Income	\$0
Itemize Deduction	\$0

Table 10: Individuals Expected Retirement Data

These metrics that the individual provides the information needed for sheets 5 and 6 in the model. These sheets are the calculations for the tax torpedo for the individual, with sheet 5 being the calculations if the individual is a single filer, and sheet 6 being the calculations if the individual is married filing jointly.



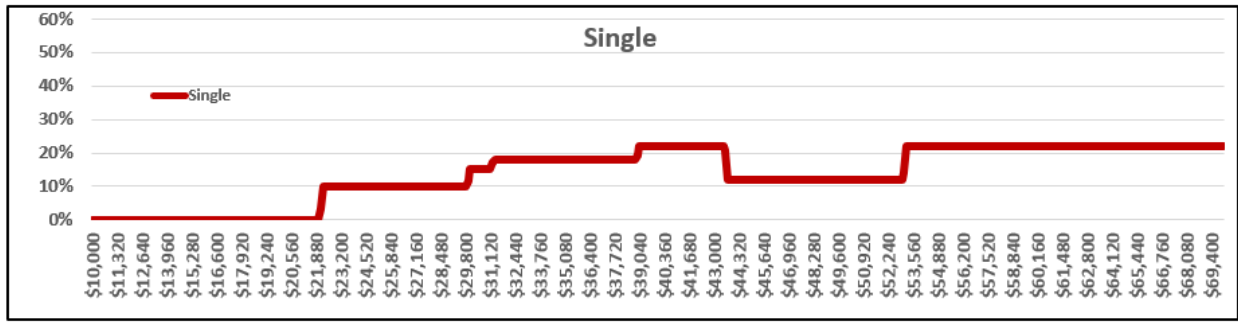


Figure 3: Tax Torpedo for Individuals Filing Single

The above graph shows the tax torpedo for individuals who file single.

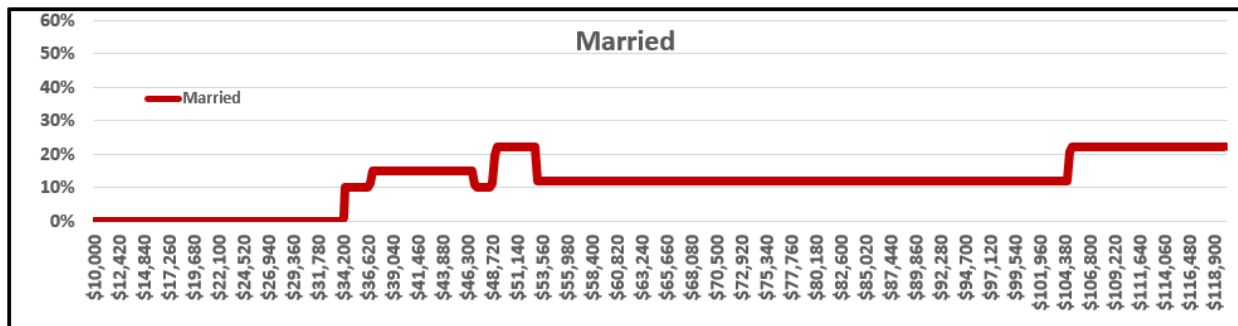


Figure 4: Tax Torpedo for Married Individuals Filing Jointly

The above graph shows the tax torpedo for individuals who file married jointly.

### Part 3

This last part is a culmination of the first two parts and shows the conclusions that the model comes to. The first thing to mention in this part is the two Excel sheets that we haven't talked about yet, sheets 3 and 4. These sheets are doing a majority of the calculations and they are similar to most other models. Since sheet 5 and 6 finds the expected retirement tax rate for an individual, Sheet 4 finds the current tax rate for an individual and the conversion tax rate for an individual. The table below, Table 11, shows the taxes an individual who files single will pay.

Single Filers -or- Married Filing Separately			Income	\$50,000.00	\$550,000.00	
Tax rate	Taxable Income bracket		Tax owed	Taxed?	Amount	Conversion Taxes
10%	\$0.00	\$9,700.00	10% of taxable income	Yes	\$970.00	\$970.00
12%	\$9,701.00	\$39,475.00	\$970.00 plus 12% of the amount over \$9,700	Yes	\$3,573.00	\$3,573.00
22%	\$39,476.00	\$84,200.00	\$4,543 plus 22% of the amount over \$39,475	Middle	\$2,315.50	\$112,315.50
24%	\$84,201.00	\$160,725.00	\$14,382.50 plus 24% of the amount over \$84,200	No	\$0.00	\$0.00
32%	\$160,726.00	\$204,100.00	\$32,748.50 plus 32% of the amount over \$160,725	No	\$0.00	\$0.00
35%	\$204,101.00	\$510,300.00	\$46,628.50 plus 35% of the amount over \$204,100	No	\$0.00	\$0.00
37%	\$510,301.00	∞	\$153,798.50 plus 37% of the amount over \$510,300	No	\$0.00	\$0.00
					\$6,858.50	\$116,858.50

Table 12: Taxes for an Individual who Files Single

The table below, Table 12, shows the taxes an individual who is married filing jointly will pay.

Married filing jointly or qualifying widow			Income	\$50,000.00	\$550,000.00	
Tax rate	Taxable income		Tax owed	Taxed?	Amount	Conversion Taxes
10%	\$0	\$19,400	10% of taxable income	Yes	\$1,940.00	\$1,940.00
12%	\$19,401	\$78,950	\$1,940.00 plus 12% of the amount over \$19,400	Middle	\$3,672.00	\$63,672.00
22%	\$78,951	\$168,400	\$9,086.00 plus 22% of the amount over \$78,950	No	\$0.00	\$0.00
24%	\$168,401	\$321,450	\$28,765.00 plus 24% of the amount over \$168,400	No	\$0.00	\$0.00
32%	\$321,451	\$408,200	\$65,497.00 plus 32% of the amount over \$321,450	No	\$0.00	\$0.00
35%	\$408,201	\$612,350	\$93,257.00 plus 35% of the amount over \$408,200	No	\$0.00	\$0.00
37%	\$612,351	∞	\$164,709.50 plus 37% of the amount over \$612,350	No	\$0.00	\$0.00
					\$5,612.00	\$65,612.00

Table 11: Taxes for an Individual who Files Single

These two tables along with the Part 2 gives us all the tax rates that we need which can be found on sheet 1 of the model, as in Table 13 below.

Tax Rates	
Current Income Tax Rate	13.72%
Conversion Tax Rate	21.25%
Income Tax Rate - Retirement	7.93%

Table 13: Tax Rates for an Individual

These tax rates combined with part 1 above, merge together in the model as excel sheet 3, “Conversion Detail”. This sheet is the backbone of my model and does a majority of the

calculations. It calculates the expected future value if the individual does not convert their Traditional IRA, and the expected future value if the individual does convert their Traditional IRA.

Yr	Age	RMD Factor	Traditional IRA				Current Income Tax 13.72%	Retirement Tax Rate 7.93%	TOTAL INVESTMENT BALANCE
			Beginning Balance	Distributions	Growth 7.00%	Ending Balance			
1	55	-	\$ 800,000	\$ -	\$ 56,000	\$ 856,000	\$ (117,418)	\$ -	\$ 738,582
2	56	-	\$ 856,000	\$ -	\$ 59,920	\$ 915,920	\$ (125,637)	\$ -	\$ 790,283
3	57	-	\$ 915,920	\$ -	\$ 64,114	\$ 980,034	\$ (134,431)	\$ -	\$ 845,603
4	58	-	\$ 980,034	\$ -	\$ 68,602	\$ 1,048,637	\$ (143,842)	\$ -	\$ 904,795
5	59	-	\$ 1,048,637	\$ -	\$ 73,405	\$ 1,122,041	\$ (153,910)	\$ -	\$ 968,131
6	60	-	\$ 1,122,041	\$ -	\$ 78,543	\$ 1,200,584	\$ (164,684)	\$ -	\$ 1,035,900
7	61	-	\$ 1,200,584	\$ -	\$ 84,041	\$ 1,284,625	\$ (176,212)	\$ -	\$ 1,108,413
8	62	-	\$ 1,284,625	\$ -	\$ 89,924	\$ 1,374,549	\$ (188,547)	\$ -	\$ 1,186,002
9	63	-	\$ 1,374,549	\$ -	\$ 96,218	\$ 1,470,767	\$ (201,745)	\$ -	\$ 1,269,022
10	64	-	\$ 1,470,767	\$ -	\$ 102,954	\$ 1,573,721	\$ (215,867)	\$ -	\$ 1,357,854
11	65	-	\$ 1,573,721	\$ -	\$ 110,160	\$ 1,683,882	\$ -	\$ (133,468)	\$ 1,550,413
12	66	-	\$ 1,683,882	\$ -	\$ 117,872	\$ 1,801,753	\$ -	\$ (142,811)	\$ 1,658,942
13	67	-	\$ 1,801,753	\$ -	\$ 126,123	\$ 1,927,876	\$ -	\$ (152,808)	\$ 1,775,068
14	68	-	\$ 1,927,876	\$ -	\$ 134,951	\$ 2,062,827	\$ -	\$ (163,504)	\$ 1,899,323
15	69	-	\$ 2,062,827	\$ -	\$ 144,398	\$ 2,207,225	\$ -	\$ (174,950)	\$ 2,032,276
16	70	27.4	\$ 2,207,225	\$ (80,556)	\$ 148,867	\$ 2,275,536	\$ -	\$ (180,364)	\$ 2,095,172
17	71	26.5	\$ 2,275,536	\$ (85,869)	\$ 153,277	\$ 2,342,944	\$ -	\$ (185,707)	\$ 2,157,237
18	72	25.6	\$ 2,342,944	\$ (91,521)	\$ 157,600	\$ 2,409,022	\$ -	\$ (190,944)	\$ 2,218,078
19	73	24.7	\$ 2,409,022	\$ (97,531)	\$ 161,804	\$ 2,473,295	\$ -	\$ (196,039)	\$ 2,277,256
20	74	23.8	\$ 2,473,295	\$ (103,920)	\$ 165,856	\$ 2,535,232	\$ -	\$ (200,948)	\$ 2,334,283
21	75	22.9	\$ 2,535,232	\$ (110,709)	\$ 169,717	\$ 2,594,239	\$ -	\$ (205,625)	\$ 2,388,614
22	76	22.0	\$ 2,594,239	\$ (117,920)	\$ 173,342	\$ 2,649,662	\$ -	\$ (210,018)	\$ 2,439,644
23	77	21.2	\$ 2,649,662	\$ (124,984)	\$ 176,727	\$ 2,701,405	\$ -	\$ (214,119)	\$ 2,487,286
24	78	20.3	\$ 2,701,405	\$ (133,074)	\$ 179,783	\$ 2,748,114	\$ -	\$ (217,822)	\$ 2,530,293
25	79	19.5	\$ 2,748,114	\$ (140,929)	\$ 182,503	\$ 2,789,688	\$ -	\$ (221,117)	\$ 2,568,571

Table 14: Expected Future Value of keeping all money in a Traditional IRA

The above table shows the expected future value of a 55-year-old individual who plans on retiring at 65, and keeps all of their money in a Traditional IRA. If the individual currently has \$800,000 in their Traditional IRA, after 25 years it will be worth \$2,568,571.

Yr	Age	RMD Factor	Traditional IRA				Roth IRA				Current Income Tax 13.72%	Retirement Tax Rate 7.93%	TOTAL INVESTMENT BALANCE
			Beginning Balance	Distributions	Growth 7.00%	Ending Balance	Beginning Balance	Distributions	Growth 7.00%	Ending Balance			
1	55	-	\$ 300,000	\$ -	\$ 21,000	\$ 321,000	\$ 500,000	\$ (106,235)	\$ 27,564	\$ 421,329	\$ (101,825)	\$ -	\$ 640,503
2	56	-	\$ 321,000	\$ -	\$ 22,470	\$ 343,470	\$ 421,329	\$ -	\$ 29,493	\$ 450,822	\$ (108,953)	\$ -	\$ 685,339
3	57	-	\$ 343,470	\$ -	\$ 24,043	\$ 367,513	\$ 450,822	\$ -	\$ 31,558	\$ 482,379	\$ (116,580)	\$ -	\$ 733,312
4	58	-	\$ 367,513	\$ -	\$ 25,726	\$ 393,239	\$ 482,379	\$ -	\$ 33,767	\$ 516,146	\$ (124,740)	\$ -	\$ 784,644
5	59	-	\$ 393,239	\$ -	\$ 27,527	\$ 420,766	\$ 516,146	\$ -	\$ 36,130	\$ 552,276	\$ (133,472)	\$ -	\$ 839,569
6	60	-	\$ 420,766	\$ -	\$ 29,454	\$ 450,219	\$ 552,276	\$ -	\$ 38,659	\$ 590,935	\$ (142,815)	\$ -	\$ 898,339
7	61	-	\$ 450,219	\$ -	\$ 31,515	\$ 481,734	\$ 590,935	\$ -	\$ 41,365	\$ 632,301	\$ (152,812)	\$ -	\$ 961,223
8	62	-	\$ 481,734	\$ -	\$ 33,721	\$ 515,456	\$ 632,301	\$ -	\$ 44,261	\$ 676,562	\$ (163,509)	\$ -	\$ 1,028,508
9	63	-	\$ 515,456	\$ -	\$ 36,082	\$ 551,538	\$ 676,562	\$ -	\$ 47,359	\$ 723,921	\$ (174,955)	\$ -	\$ 1,100,504
10	64	-	\$ 551,538	\$ -	\$ 38,608	\$ 590,145	\$ 723,921	\$ -	\$ 50,674	\$ 774,595	\$ (187,201)	\$ -	\$ 1,177,539
11	65	-	\$ 590,145	\$ -	\$ 41,310	\$ 631,456	\$ 774,595	\$ -	\$ 54,222	\$ 828,817	\$ -	\$ (152,311)	\$ 1,307,962
12	66	-	\$ 631,456	\$ -	\$ 44,202	\$ 675,657	\$ 828,817	\$ -	\$ 58,017	\$ 886,834	\$ -	\$ (162,972)	\$ 1,399,519
13	67	-	\$ 675,657	\$ -	\$ 47,296	\$ 722,954	\$ 886,834	\$ -	\$ 62,078	\$ 948,913	\$ -	\$ (174,380)	\$ 1,497,486
14	68	-	\$ 722,954	\$ -	\$ 50,607	\$ 773,560	\$ 948,913	\$ -	\$ 66,424	\$ 1,015,336	\$ -	\$ (186,587)	\$ 1,602,310
15	69	-	\$ 773,560	\$ -	\$ 54,149	\$ 827,709	\$ 1,015,336	\$ -	\$ 71,074	\$ 1,086,410	\$ -	\$ (199,648)	\$ 1,714,471
16	70	27.4	\$ 827,709	\$ (30,208)	\$ 55,825	\$ 853,326	\$ 1,086,410	\$ -	\$ 76,049	\$ 1,162,459	\$ -	\$ (209,190)	\$ 1,806,595
17	71	26.5	\$ 853,326	\$ (32,201)	\$ 57,479	\$ 878,604	\$ 1,162,459	\$ -	\$ 81,372	\$ 1,243,831	\$ -	\$ (219,107)	\$ 1,903,328
18	72	25.6	\$ 878,604	\$ (34,320)	\$ 59,100	\$ 903,383	\$ 1,243,831	\$ -	\$ 87,068	\$ 1,330,899	\$ -	\$ (229,407)	\$ 2,004,875
19	73	24.7	\$ 903,383	\$ (36,574)	\$ 60,677	\$ 927,486	\$ 1,330,899	\$ -	\$ 93,163	\$ 1,424,062	\$ -	\$ (240,098)	\$ 2,111,450
20	74	23.8	\$ 927,486	\$ (38,970)	\$ 62,196	\$ 950,712	\$ 1,424,062	\$ -	\$ 99,684	\$ 1,523,746	\$ -	\$ (251,185)	\$ 2,223,273
21	75	22.9	\$ 950,712	\$ (41,516)	\$ 63,644	\$ 972,840	\$ 1,523,746	\$ -	\$ 106,662	\$ 1,630,409	\$ -	\$ (262,674)	\$ 2,340,574
22	76	22.0	\$ 972,840	\$ (44,220)	\$ 65,003	\$ 993,623	\$ 1,630,409	\$ -	\$ 114,129	\$ 1,744,537	\$ -	\$ (274,571)	\$ 2,463,589
23	77	21.2	\$ 993,623	\$ (46,869)	\$ 66,273	\$ 1,013,027	\$ 1,744,537	\$ -	\$ 122,118	\$ 1,866,655	\$ -	\$ (286,912)	\$ 2,592,770
24	78	20.3	\$ 1,013,027	\$ (49,903)	\$ 67,419	\$ 1,030,543	\$ 1,866,655	\$ -	\$ 130,666	\$ 1,997,321	\$ -	\$ (299,672)	\$ 2,728,192
25	79	19.5	\$ 1,030,543	\$ (52,848)	\$ 68,439	\$ 1,046,133	\$ 1,997,321	\$ -	\$ 139,812	\$ 2,137,133	\$ -	\$ (312,892)	\$ 2,870,374

Table 15: Expected Future Value of Converting \$500,000 to a Roth IRA

The above table, Table 15, shows the expected future value of a 55-year-old individual who plans on retiring at 65, and converts \$500,000 of their Traditional IRA to a Roth IRA and keeps \$300,000 in their Traditional IRA. After 25 years it will be worth \$2,870,374.

Since these 2 charts are not very user friendly to view, they combine into the Summary chart on the Excel sheet 1, which can be seen in Table 16 below.

Summary	No Conversion	Roth IRA Conversion	Profit	Convert	Age of Breakeven
Total Investment Balance - 5 Years	\$ 968,131	\$ 839,569	\$ (128,562)	DON'T CONVERT	22
Total Investment Balance - 10 Years	\$ 1,357,854	\$ 1,177,539	\$ (180,314)	DON'T CONVERT	
Total Investment Balance - 15 Years	\$ 2,032,276	\$ 1,714,471	\$ (317,804)	DON'T CONVERT	
Total Investment Balance - 20 Years	\$ 2,334,283	\$ 2,223,273	\$ (111,010)	DON'T CONVERT	
Total Investment Balance - 25 Years	\$ 2,568,571	\$ 2,870,374	\$ 301,803	CONVERT	
Total Investment Balance - 30 Years	\$ 2,661,618	\$ 3,695,189	\$ 1,033,571	CONVERT	
Total Investment Balance - 35 Years	\$ 2,527,229	\$ 4,758,947	\$ 2,231,718	CONVERT	
Total Investment Balance - 40 Years	\$ 2,110,342	\$ 6,170,661	\$ 4,060,318	CONVERT	
Total Investment Balance - 45 Years	\$ 1,455,332	\$ 8,125,955	\$ 6,670,623	CONVERT	
Total Investment Balance - 50 Years	\$ 750,110	\$ 10,943,371	\$ 10,193,262	CONVERT	

**Table 16: Summary of Model Results**

For this example, used in the entire paper, this specific individual should convert if they think they may live till they are 77. If they convert and only live till 75, they will have lost out on \$111,010. If they live till 80, they will have made an extra \$301,803. Now, as mentioned in the first chapter, people tend to live longer than expected. If this individual happens to live until they are 90, they will have made a profit of \$2,231,718.

## Conclusion

In conclusion, I understand that this model can be added upon in future research. I believe the best place to start would be looking into different types of retirement accounts and seeing if and how those are affected by a tax torpedo. This may give even more insight into the optimal retirement strategy for an individual.

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## ACADEMIC VITA

# IAN R. HAMSHER

irhamsher@gmail.com

### EDUCATION

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**The Pennsylvania State University | The Schreyer Honors College** **University Park, PA**  
*Smeal College of Business* | Bachelor of Science in Finance Class of May 2019  
*College of the Liberal Arts* | Bachelor of Science in Economics Deans List 6/6  
*Smeal College of Business* | Minor in Entrepreneurship and Corporate Innovation

### RELEVANT EXPERIENCE

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**INTL FCStone** **New York, NY**  
*Fixed Income Sales and Trading Summer Analyst* *May 2018 – Aug 2018*

- Built models for auto loan, esoteric, timeshare, and whole business asset backed securities, that showed historic new issue spreads to the swaps curve, and let the user to compare the different tranches and issuers
- Compiled a list of 7,000 prospective Federal Home Loan Banks and 300 prospective European Clients that trade Corporate Paper to assist the firm in acquiring new clients
- Shadowed Sales and Trading personnel to learn basic information about some fixed income products such as: Mortgage Backed Securities, Asset Backed Securities, Collateralized Mortgage Obligations, Corporate Paper, and Treasuries

**Penn State Investment Association** **University Park, PA**  
*Analyst | Financials and Information Technology Sectors* *Sep 2015 – Present*

- Established technical skills in valuation methods of companies such as the understanding of a discounted cash flow model, precedent transactions, and comparable and ratio analyses
- Researched, analyzed, and maintained a mock security portfolio and presented a stock pitch of the companies ICON PLC, Raytheon, and Delphi Automotive to an executive board of 8 members and qualified for the finals for Delphi Automotive
- Added support and value to the overall success of the Nittany Lion Fund, a \$7 million hedge fund of investments managed by students

**Wall Street Boot Camp 1 and 2** **University Park, PA**  
*Member* *Jan 2017 – Present*

- Selected from over 250 students to engage as part of a 40-student cohort in weekly sessions designed to prepare students for careers on Wall Street via presentations and workshops on topics such as: Investment Banking, Sales and Trading, Wealth Management, as well technical skills such as accounting, modeling, and financial statement analysis

**Textron Aviation Inc.** **Wichita, KS**  
*Parts and Programs Sales Intern* *May 2017 – August 2017*

- Developed parts expenditure analysis to compare what is covered under warranty along with ProParts and made a visual representation in Power BI that can be used as a sales tool
- Analyzed the price of airplane parts to create a cash flow tool to show customers the benefit of the program ProParts

**Personal Portfolio** **University Park, PA**  
*Manager* *Sep 2016 – Present*

- Managed a portfolio trading different equities and commodities through buy/sell, short/cover, and call/put options

### LEADERSHIP EXPERIENCE

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**Alpha Kappa Psi Co-Ed Professional Business Fraternity** **University Park, PA**  
*President* *Feb 2018 – Present*

- Augmented the professional and philanthropic development of 120 brothers to ensure 100% job placement amongst graduating seniors and eligible juniors by increasing professional exposure and workshops
- Coordinated with an executive board of 7 members to obtain sponsors such as Blackrock, Fisher Investments, Altria, and TEKsystems for the professional development of the fraternity
- Updated the brotherhood on annual plans and ensured compliance with procedures and expectations

*Vice President of Finance* *Oct 2017 – Feb 2018*

- Budgeted the student bank account to pay dues in a timely manner, reimburse chairs, and provide pay order for suggested events

**Global Business Brigades** **University Park, PA**  
*Executive Board / Vice President of Membership* *May 2017 – May 2018*

- Managed the recruitment of new members to participate in the philanthropic business brigade which strives to enhance rural developing communities throughout Central America and Africa

*Consultant* *Sep 2015 – May 2017*

- Provided financial literacy education, micro-enterprise consulting, and promoted community based credit savings to 509 community members of the developing Central American nation of Honduras
- Educated the community on the importance of business and facilitated a financial plan for its newly opening bakery by calculating cost analysis and profit projections with the outcome of a 7-week business plan

### HONORS/SKILLS/INTERESTS

- 
- Honors: Schreyer Academic Excellence Scholarship, National AP Scholar, AP Scholar with Distinction, National Honor Society
  - Skills: Working knowledge in Bloomberg and Microsoft Office (Word, PowerPoint, Excel, Power BI)
  - Other Activities/Interests: Billy Joel, Buffalo Bills, James Bond, kayaking, skiing, soccer, volleyball