

# Rethinking Asset Location

## between tax-deferred, tax-exempt and taxable accounts

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### Abstract

The Asset Location (AL) decision determines which of the assets owned should be held in which account-type (tax-deferred, tax-exempt or taxable) in order to maximize the tax-reduction benefits from those accounts and to maximize ending wealth.

This paper argues against AL practices that

- a) phrase general rules in terms of asset-types, instead of in terms of the metrics that decide the issue,
- b) produce rules for AL that are shown to fail to maximize wealth and
- c) ignore the impact of a change in tax rates between contribution and withdrawal, and
- d) make the objective of AL to maximize the utility from mean-variance-optimization, while ignoring tax-reduction benefits and ending wealth.

A general model of the accounts is created that calculates their benefits and deconstructs the total benefit into its two sources. The two sources of benefits are analyzed to develop AL rules.

An AL procedure is illustrated to deal with the most complicated situations. The metrics used for ranking assets are the same calculations that deconstruct the accounts' benefits. The procedure is extended to include the Asset Allocation decision.

Keywords: Asset location; Asset allocation; Tax-exempt; Tax-deferred; taxes and retirement savings; portfolio selection; Roth IRA; IRA; RRSP; TFSA

JEL Classification G11

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### TABLE OF CONTENTS

INTRODUCTION .....	3
DESCRIPTION OF THE TAX SHELTER ACCOUNTS .....	3
PHRASING OF ADVICE.....	4
COMMONLY HEARD ASSET LOCATION RULES.....	4
THE BENEFITS OF TAX SHELTER ACCOUNTS.....	7
BENEFITS FROM TAX-SHELTERED PROFITS.....	9
BONUS (OR PENALTY) FROM CHANGED TAX RATES .....	11
THE ASSET LOCATING PROCESS .....	12
AN EXAMPLE OF THE PROCESS.....	12
COMBINE ASSET LOCATION AND ASSET ALLOCATION .....	13
THE ASSET LOCATION OBJECTIVE.....	14
CONCLUSIONS.....	16
PUBLISHED PAPERS.....	17

## INTRODUCTION

The Asset Location decision determines which of the assets owned (or to be owned after the Asset Allocation decision) should be held in which account-type in order to maximize the tax-reduction benefits of those accounts and to maximize ending wealth. Although the broader issue includes many other account types (e.g., trusts, offshore accounts, insurance policies, etc.) this paper limits the accounts considered to

- normally taxable accounts,
- tax-deferred accounts (TDAs), and
- tax-exempt accounts (TEAs).
- When comments apply to both TDAs and TEAs the term 'tax shelter accounts' will be used in this paper.

The broader issue includes decisions to move money between accounts, but this paper assumes the size of each account is a given. Government regulations that differ between countries restrict movement in and out of tax shelter accounts.

This paper looks at the math to determine how the decision should be made, and whether there are any broadly relevant rules of thumb.

## DESCRIPTION OF THE TAX SHELTER ACCOUNTS

Many countries encourage savings, particularly savings for retirement, with special accounts that reduce taxes otherwise payable in taxable accounts. Despite fine-tuned regulations that differ from country to country, there are two common generalized structures.

For both TDAs and TEAs, profits earned inside the accounts are never taxed. Past Asset Location literature has limited itself to this benefit, which is always equal between the two accounts.

Contributions to TEAs come from after-tax savings, the same as contributions to a taxable account. There is no tax event when assets are withdrawn from TEAs.

Contributions to TDAs come from before-tax savings. In the U.S. and Canada this is effected by claiming the contribution as a reduction to taxable income. The reduced taxable income reduces taxes owing at each person's marginal tax rate. Some countries may directly deposit a matching percentage into the account, and not flow the transaction through the tax return. For the purposes of this paper the marginal tax rate in those situations would be the matching dollars as a percent of the total resulting combined contribution.

The tax reduction on contribution (Contribution Credit) can be thought of as a loan from the government. The government's money gets invested along with the investor's own after-tax savings. There is no benefit from this loan because the amount to be repaid grows at the same rate as the realized returns.

Withdrawals from TDAs are added to taxable income in the year of withdrawal, increasing taxes paid at each person's marginal tax rate. The taxes paid are an allocation of the principal between the owner and the government, or a repayment of the government's loan, not a tax of profits.<sup>1</sup> When the marginal tax rate on withdrawal is lower (or higher) than the rate on contribution, an additional bonus (or penalty) is created. Past Asset Location literature has ignored this bonus/penalty.

### PHRASING OF ADVICE

Conclusions regarding the optimal Asset Location decision often take the form of generalized rules for particular asset-types (e.g. "Typically bonds are held in TDAs to defer tax"<sup>2</sup>).

These conclusions are worthless because it is not the asset-type that determines the issue. The issue is determined by the specific attributes of each asset; the rate of return and the effective tax rate on its profits. These attributes will differ over time, between individuals and between assets within any asset-type. Any generalization will be wrong in many situations, without the investor knowing.

- E.g. Debt assets include high-yield junk bonds that are fully taxed, as well as low-return Municipal bonds that attract no tax.
- E.g. Historical average rates of return from Debt are unlikely when 10-year Treasuries currently yield 1.5%.
- E.g. Rules developed using top marginal tax brackets will not apply to investors in the bottom tax bracket.

Any generalized advice and rules for Asset Location should be phrased so that investors can make their own decisions based on their particular situations.

### COMMONLY HEARD ASSET LOCATION RULES

The most commonly heard rule of Asset Location is "*Long-run wealth accumulation generally will be maximized by placing the most heavily taxed assets in the tax-deferred account while holding the less heavily taxed asset in the taxable account*".<sup>3</sup> True or false?

False. The objective of AL is not to minimize tax percentages. Percentages won't pay the bills. Reducing tax dollars is the objective. This advice comes from the misunderstanding that profits in TDAs are only tax-deferred but taxed on withdrawal at full tax rates. Any benefit from a deferral of taxes calculated at low rates would be offset by the high tax rate on withdrawal. But the profits in TDAs are never taxed (see the Description of Accounts above), so this reasoning is wrong.

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<sup>1</sup> For a conceptual model of TDAs see the spreadsheet <http://www.retailinvestor.org/RRSPmodel.xls> and explanation <http://www.retailinvestor.org/RRSPmodel.html>.

<sup>2</sup> "A Scenario Based Approach", A. Berkin, et al in the Journal of Financial Planning August 2013 <http://www.fpanet.org/journal/AScenarioBasedApproachtoAfterTaxAssetAllocation/>

<sup>3</sup> "Asset Location for Retirement Savers" by Poterba, Shoven, Sialm <http://www.mcombs.utexas.edu/faculty/Clemens.Sialm/PSSChap10.pdf>

The rule can be tested with a spreadsheet model that tracks over time a taxable account and tax shelter account, where two assets are held and rebalanced <sup>4</sup>. In the example below Asset B is taxed at twice the rate of Asset A, but when it is prioritized in the tax shelter the resulting wealth is lower.

**Figure 1:**

Variables	A	B	Tax Rate on Contributions	30%
Rate of Return	7.0%	3.5%	Tax Rate on Withdrawals	30%
Income Tax %	15.0%	30.0%	TDA Balance @ Start	\$ 1,000 or \$ 700 in a TEA
Allocation	50%	50%	Taxable Balance @ Start	\$ 700

Asset A Prioritized in Tax Shelter Account						
	Tax Shelter Acct		Taxable Account		Ending Wealth	
	A	B	B	A	TEA	TDA
t=0	700.00	-	700.00	-	1,400	1,400
profit	49.00	-	24.50	-		
tax	-	-	7.35	-		
t=1	749.00	-	717.15	-	1,466	1,466
rebalance	733.08	15.93	717.15	-	1,466	1,466
t=29	2,827.52	1,308.20	1,412.36	-	5,548	5,548
rebalance	2,774.04	1,361.68	1,412.36	-	5,548	5,548
profit	194.18	47.66	49.43	-		
tax	-	-	14.83	-		-
t=30	2,968.22	1,409.34	1,446.96	-	5,825	5,825

Asset B Prioritized in Tax Shelter Account						
	Tax Shelter Acct		Taxable Account		Ending Wealth	
	B	A	A	B	TEA	TDA
t=0	700.00	-	700.00	-	1,400	1,400
profit	24.50	-	49.00	-		
tax	-	-	7.35	-		
t=1	724.50	-	741.65	-	1,466	1,466
rebalance	724.50	-	733.08	8.58	1,466	1,466
t=29	1,898.31	-	2,650.15	683.54	5,232	5,232
rebalance	1,898.31	-	2,616.00	717.69	5,232	5,232
profit	66.44	-	183.12	25.12		
tax	-	-	27.47	7.54		-
t=30	1,964.76	-	2,771.65	735.27	5,472	5,472

<sup>4</sup> Access spreadsheet at <http://www.retailinvestor.org/Challenge.xls> Tab at bottom called "YearByYear"

Notice in the model above, how the government's loan, created by the TDA's reduced taxes on contributions, is not included in either the calculation of the investor's wealth or the rebalancing. The government's money just goes along for the ride alongside the investor's wealth (as discussed in the Description of Tax Shelter Accounts section above).

Another rule sometimes explicit<sup>5</sup> but normally implicit in academic papers is to prioritize assets according to 'tax efficiency' - the difference between the nominal rate of return and the after-tax rate of return, or stated another way – the tax dollars paid per \$100 invested.

**Calculation 1:**

$$(\text{Nominal Rate of Return}) \text{ less } (\text{AfterTax Rate of Return})$$

E.g. Asset A difference =  $7\% - [7\% \times (1-15\%)] = 1.05$ , and Asset B difference =  $3.5\% - [3.5\% \times (1-30\%)] = 1.05$

**Calculation 2:**

$$(\text{Nominal Rate of Return}) \times (\text{Tax Rate})$$

E.g. Asset A =  $7\% \text{ return} \times 15\% \text{ tax rate} = 1.05$ , and Asset B =  $3.5\% \text{ return} \times 30\% \text{ tax rate} = 1.05$ .

When tested this rule fails as well. The two assets in the example shown above have the same 1.05 'tax efficiency'. According to this AL rule, the results should be the same whichever asset is in the tax shelter. But the results are different.

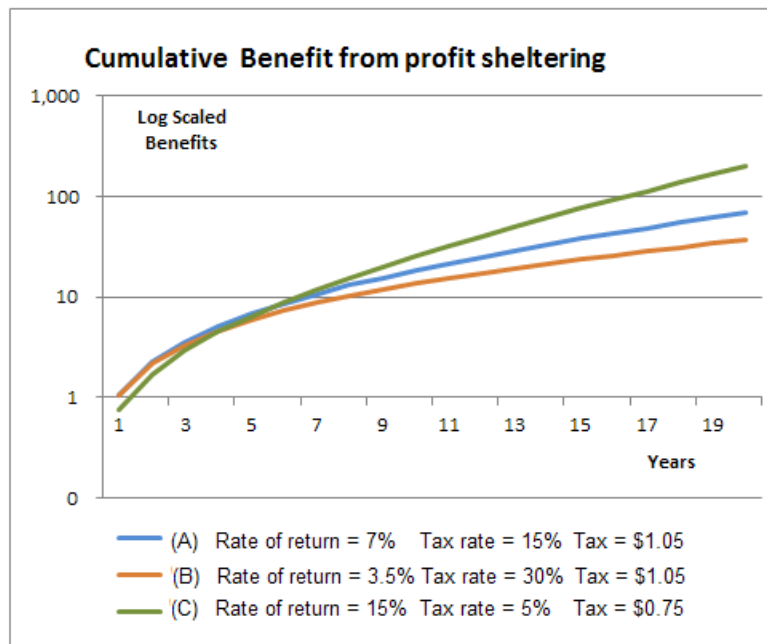
To see why, track two years of growth. The taxes are equal in only the first year. By the second year the taxes (which would be sheltered) are larger for Asset A. Compounding over time changes everything.

	<b>Asset A Holdings</b>	<b>7% Income</b>	<b>15% Tax</b>	<b>Asset B Holdings</b>	<b>3.5% Income</b>	<b>30% Tax</b>
<b>Year1</b>	1,000	70.00	10.50	1,000	35.00	10.50
<b>Year2</b>	1,070	74.90	11.24	1,035	36.23	10.87

The graph below tracks the cumulative benefit from sheltering profits from tax over time. It assumes no bonus / penalty from a difference between contribution/withdrawal tax rates, and no rebalancing. The first two assets have the same 'tax efficiency' = 1.05. The asset with the higher rate of return shows a larger benefit after year one. The third asset starts with a lower 'tax-efficiency' = 0.75 yet its cumulative benefit surpass the other two within a few years, again because of its larger rate of return.

The 'tax efficiency' metric does not work for Asset Location decisions.

<sup>5</sup> "The Optimal Allocation of Pension Fund Assets" 1991 Potts, Reichenstein  
[http://www2.stetson.edu/fsr/abstracts/vol\\_1\\_num1\\_p9.pdf](http://www2.stetson.edu/fsr/abstracts/vol_1_num1_p9.pdf)

**Figure 2:**

### THE BENEFITS OF TAX SHELTER ACCOUNTS

It is necessary to understand how the tax shelter accounts produce benefits before trying to maximize those benefits. This step is missing from all other papers. Below is a spreadsheet<sup>6</sup> screenshot. It calculates the accounts' benefits as the difference between the resulting wealth if in a taxable account and if in a tax shelter account. Then it deconstructs the TDA's total benefit into two sources.

(A) measures the benefit from the profits not being taxed. Both accounts produce this benefit. It equals the difference between the future value of the after-tax savings compounded at the nominal rate of return, and the value compounded at the after-tax rate of return (*Calculation 3*).

(B) may be either a Bonus or a Penalty depending on whether the TDA's tax rate on withdrawal is smaller or larger than the tax rate on contribution. It equals the amount withdrawn from the TDA multiplied by the change in tax rates (*Calculation 4*). This impacts only TDA net benefits, not TEA's.

<sup>6</sup> Access spreadsheet at <http://www.retailinvestor.org/Challenge.xls>

Figure 3:

<b>Variables</b>			<b>Calculate and Deconstruct Benefits from Tax Deferred Accounts and Tax Exempt Accounts</b>		
8.0%	Rate of return earned = after tax	6.4%			
20.0%	Tax rate on profits in taxable account				
40.0%	Tax rate on contribution				
30.0%	Tax rate on withdrawal				
\$20,000	\$ Gross Wages = after tax	\$12,000			
30	Years until withdrawal				

<u>Tax Deferred</u>		<u>Taxable</u>	<u>Tax Exempt</u>
\$20,000	Gross Wages	\$20,000	\$20,000
	Taxes Paid	(8,000)	(8,000)
<u>20,000</u>	Invested at t=0	<u>12,000</u>	<u>12,000</u>
Grows 30 yrs.		Grows 30 yrs.	Grows 30 yrs.
201,253	Future Value	77,167	120,752
(60,376)	Withdrawal Tax		
<u><u>140,877</u></u>	Net Cash	<u><u>77,167</u></u>	<u><u>120,752</u></u>

<b>Benefit of TDA =</b>	Value of TDA	140,877	<b>Benefit of TEA =</b>	Value of TEA	120,752
less	Taxable Acct	(77,167)	less	Taxable Acct	(77,167)
	Benefit	<u><u>63,710</u></u>		Benefit	<u><u>43,585</u></u>

<b>Deconstruction of TDA Benefits</b>		
A) Profits sheltered from tax	43,585	= TEA's benefit
B) Change in tax rates	20,125	= bonus / (penalty) .
	<u><u>63,710</u></u>	

**Calculation 3: Benefit from tax-sheltered profits**

$$\begin{aligned}
 & [AfterTaxSavings \times (1 + Rate\ of\ Return)^{\#years}] \\
 & \quad \text{less} \\
 & [AfterTaxSavings \times (1 + After\ Tax\ Rate\ of\ Return)^{\#years}]
 \end{aligned}$$

**Calculation 4: Bonus /Penalty from change in tax rates between contribution and withdrawal**

$$\$Withdrawn \times (TaxRate\ on\ Contribution - Tax\ Rate\ on\ Withdrawal)$$



Look at the presumptions used in past Asset Location papers. Potts and Reichenstein (1991)<sup>7</sup> thought:

*"Pension tax structures generally have three advantages and one potential disadvantage when compared to non-pension tax structures. The first advantage is the tax-deferral of the investment amount until withdrawal.' The second is the tax deferral until withdrawal of investment return-interest, dividends, and capital gains. The third advantage stems from the common expectation that individuals will be in lower tax brackets upon retirement.*  
*A potential disadvantage is present due to a possible reinstatement of a capital gains exclusion; under a pension tax structure all capital gains are taxed upon withdrawal, while capital gains realized outside of a pension could benefit from the exclusion."*

None of that is correct. They confused the individual mechanics with the net benefits of the whole. They make a presumption of benefits that may be penalties in reality. If you start with wrong assumptions about where the benefits of tax shelter accounts come from, you will surely end up with wrong conclusions.

### BENEFITS FROM TAX-SHELTERED PROFITS

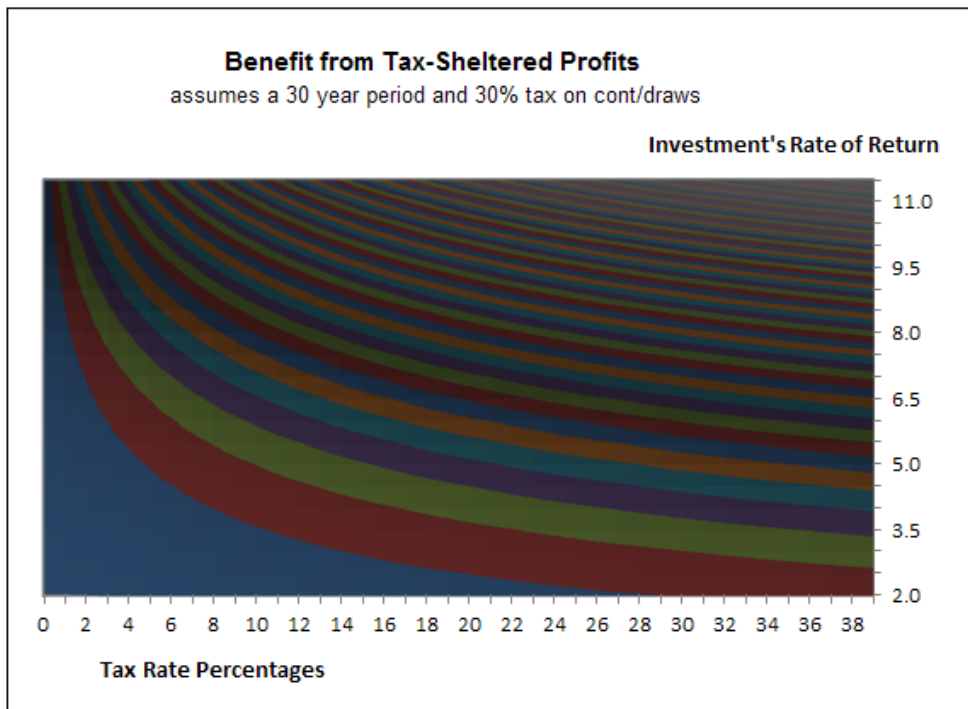
In both TDAs and TEAs profits grow without ever being taxed. The calculations for tax efficiency (*Calculation 1* and *Calculation 2* above) seem to be valid metrics to measure this benefit. But once you take Time into consideration the rate of return variable becomes the most important. Higher returns grow the account faster. A larger account produces larger profits and larger taxes, no matter how small the tax rate (within limits).

The *Calculation 3* above is a valid metric that correctly ranks the benefit from profit sheltering. Yes, it presumes no rebalancing, which is an extreme assumption. But it is not the specific dollar of benefits generated that matters here. All that matters is whether the metric produces the correct ranking of benefits. Comparing results from this 'never-rebalance' model (*Figure 2*) to the results from the 'yearly-rebalancing' model (*Figure 1*), shows they are consistent in most situations. The exceptions are when the time frame is short, in which case results should be confirmed with yearly-rebalancing model.

A visual representation of the relative importance of the rate of return, compared to the tax rate, is shown below. The benefit is calculated for each intersect and gradient lines show how the benefit changes – increasing from bottom left to top right.

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<sup>7</sup> "The Optimal Allocation of Pension Fund Assets" 1991 Potts, Reichenstein  
[http://www2.stetson.edu/fsr/abstracts/vol\\_1\\_num1\\_p9.pdf](http://www2.stetson.edu/fsr/abstracts/vol_1_num1_p9.pdf)

**Figure 4:**

Note how horizontal the gradients are at higher tax rates. An increase in tax rates increases benefits only very, very slowly, but an increase in the rate of return easily doubles benefits. But when the profits are taxed at low rates the trade-off is more equal.

This understanding supports a few AL rules of thumb for all TEAs and TDAs (assuming no difference in tax rates between contribution and withdrawal). No one objects to the obvious rule (a) "**When profits attract no tax, do not waste the room in tax shelter accounts protecting non-existent tax**". Probably no one objects to (b) "**Prioritize in tax shelter accounts those assets with both high tax rates and high rates of return, and vice versa**".

Another pretty obvious rule is (c) "**For assets with equal rates of return, prioritize in tax shelter accounts those with the largest tax rate. For assets with equal tax rates prioritize those with the largest rates of return**". Figure 2 above validates the rule (d) "**When assets are equally tax efficient (Calculations 1 and 2), give priority in tax shelter accounts to the largest rate of return**".

These rules will apply in so few situations that they are not really helpful at all. The most general rule possible, suggested by Figure 4, would be to (e) "**Prioritize in tax shelter accounts assets with the largest rates of return**". But this rule would not hold true for assets taxed at very, very low rates. It would also fail if the time span was short. The next section will show that the exact opposite may be true when withdrawals are taxed at higher tax rates.

### BONUS (OR PENALTY) FROM CHANGED TAX RATES

The deconstructed benefits in *Figure 3* show the impact of a change in tax rates between contribution and withdrawal. *Calculation 4* shows the math. It equals the amount withdrawn from the TDA multiplied by the change in tax rates. The resulting bonus (or penalty) applies only to TDAs, not TEAs.

The withdrawal tax rate used here is not the marginal rate on the last dollar of taxable income. It is the average marginal rate applied to the TDA withdrawal total, after including all other types of income. This rate may average two or more tax brackets.

Investors in retirement may qualify for income-tested pensions and other benefits from the government. Taxable withdrawals from a TDA may cut those benefits. For the AL decision, any benefits lost due to the TDA's withdrawal should be treated as an increase in taxes when calculating the marginal tax rate on withdrawal.

The Asset Location objective is to maximize any bonus and minimize any penalty. Because this factor changes nothing for TEAs, it is a common rule to ***"Put additional savings into a TDA when the withdrawal tax rate is expected to be lower, to maximize any Bonus. Savings are recommended for a TEA when the withdrawal tax rate is expected to be higher, to minimize any Penalty"***.

If tax rates on withdrawal are expected to be lower, there is no change to any of the conclusions reached in the section above considering only the benefits from tax-sheltered profits. The same high-return assets that create the larger benefits from tax-sheltered profits will also create larger bonuses from a lower tax rate on withdrawal, because the resulting account will be larger.

Higher tax rates on withdrawal though, may reverse those conclusions. The penalty created may more than offset the benefits from tax-sheltered profits.

High-return assets that create larger accounts also create larger withdrawals in retirement, which increase the likelihood of a higher tax bracket, a loss of government benefits, and a larger penalty. As will be shown in the 'Example Of the Process' section below, the low-return asset may end up being better in the TDA. There is no general rule to cover this decision. Each trade-off will be different.

Any starting assumption that the withdrawal tax rate will be lower, prompting the preference for high growth assets inside the tax-shelters, should be modelled to see exactly how big the resulting accounts will become as a result. Confirm that the effective tax rate on withdrawal will indeed not rise.

## THE ASSET LOCATING PROCESS

First estimate your personal expected rates of return for each asset-type. These are estimated from historical averages, personal past performance, market valuations and the health of the economy.

Then calculate your personal effective tax rate for each asset-type. Start with the statutory tax rate for each income-type at your personal tax bracket. Weight the different tax burdens when returns come from multiple income-types. Adjust for the effect of capital gains deferred until profits are realized. Net the dividend tax debits and credits.

If your decision is a simple choice between two asset-types and two account-types use the public spreadsheet in *Figure 1* above.<sup>8</sup> Things only get complicated when there are three account-types and three asset-types. They get even more complicated when a penalty from higher withdrawal tax rates is assumed (as follows).

Using the Rate of Return and Tax Rate for each asset-type, calculate a) the TEA's benefit from sheltered profits (*Calculation 3*), b) the bonus/penalty from a change in tax rates (*Calculation 4*), and c) the TDA's sum of the two. Rank the three benefits columns – largest benefits on top.

Start by filling any necessary taxable account with the asset ranked lowest for the TEA and Total TDA accounts. The location of the remaining assets between either tax shelter account will not change the benefit from tax-sheltered profits, so the next step is decided by the size of the bonus / penalty from a change in tax rates. Fill the TEA with assets from the bottom of the Tax Rate column's ranking. Lastly fill the TDA with the remaining assets.

## AN EXAMPLE OF THE PROCESS

This example assumes a higher tax rate on withdrawal – the most difficult Asset Location process. The choice of \$20,000 is arbitrary and makes no difference. The term chosen (30 years) need only be a rough estimate. Estimate rates of return and your personal effective tax rates for Assets A, B and C. Calculate the TEA's benefit from sheltered profits, the penalty from a higher withdrawal tax rate, and the TDA's sum of the two.

<b>Term</b> \$20,000 for 30 years <b>Contribution Tax</b> 30% <b>Withdrawal Tax</b> 45%					
Asset	Rate Return	Tax Rate	TEA Benefit	Change in Tax Rate	Total TDA Benefits
<b>A</b>	8%	15%	40,122	(30,188)	9,934
<b>B</b>	5%	20%	15,100	(12,966)	2,134
<b>C</b>	3%	40%	10,073	(7,282)	2,791

<sup>8</sup> Access spreadsheet at <http://www.retailinvestor.org/Challenge.xls> Tab at bottom called "YearByYear"

Then rank each column, largest benefits on top.

1	2	3
TEA Benefit	Change in Tax Rate	Total TDA
A	C	A
B	B	C
C	A	B

Fill the taxable account first with the lowest ranked assets in columns 1 and 3. Here there is disagreement between Asset B and C, depending on which account the asset would end up in if not chosen for the taxable account. Looking at column 2 you see that Asset C is least likely to end up in the TEA because its penalty from higher tax rates is smallest. That makes Asset B the priority for the taxable account (or last to fill any tax shelter accounts). Use Asset C for any excess room.

Fill the TEA next with the lowest ranked assets in column 2 – Asset A first, then any left-over Asset B. This leaves the Asset C with the smallest penalty from the higher withdrawal tax rate to fill the TDA.

### COMBINE ASSET LOCATION AND ASSET ALLOCATION

Once the assets have been given ranked priorities for the different account-types, how is the Asset Location decision combined with an Asset Allocation decision? Continue the example above with assumed account balances and a 30% tax bracket. You allocate your own wealth, and ignore the government's portion of the TDA.

	Account Balance	30% Loan	Your Wealth
TDA	200,000	<60,000>	140,000
TEA	50,000		50,000
Taxable	100,000		100,000
Total	350,000		290,000

Further assume a desired Asset Allocation weighting of assets.

	AA	Wealth
Asset A	20%	58,000
Asset B	30%	87,000
Asset C	50%	145,000
	<b>Total</b>	<b>290,000</b>

Now locate the assets according to the priority developed in the previous section. The taxable account gets all Asset B, and fills the remaining 13,000 with Asset C. The TEA takes up most of Asset A. The TDA gets the remains of Assets A and C.

	Wealth	Account Value	Account
Asset A	50,000 8,000	50,000 / (1-30%)= 11,429	TEA TDA
Asset B	87,000	87,000	Taxable
Asset C	13,000 132,000	13,000 / (1-30%)= 188,571	Taxable TDA
<b>Total</b>	<b>290,000</b>	<b>350,000</b>	

The allocated wealth is grossed up to include the government loan portion of the actual account values.

### THE ASSET LOCATION OBJECTIVE

Much of the literature on Asset Location for the past decade assumes an objective to maximize utility from mean-variance-optimization (MVO).<sup>9</sup> That objective conflicts with the commonly understood objective to maximize wealth by reducing taxes.

This school of thought asset allocates (AA) using mean-variance-optimization instead of simple rules-of-thumb. That process uses the expected risk and return of each asset-type to decide which combination of assets in a portfolio will deliver the greatest return for the acceptable risk. They add a layer of complexity by including the Location of each asset in this AA process. Their Asset Location conclusions are a by-product of their AA process.

The complexity they add is to double the asset-types they use for data inputs. Each asset-type has one variant using nominal returns and risk, and another variant using after-tax-returns and risk. The recommended portfolio that results from this augmented-MVO process will have assets of both nominal

<sup>9</sup> Asset Location in Tax-Deferred and Conventional Savings Accounts, by Shoven and Sialm (2003)  
<http://www.mcombs.utexas.edu/faculty/clemens.sialm/SSJPUBE.pdf>

and after-tax variants. The after-tax variants are, by definition, Located in the taxable account. The nominal variants are Located in the tax-shelter accounts.

There are reasons to reject this approach. First, as shown with the example above, Asset Allocation and Asset Location can be addressed independently. Most investors quite adequately manage risk with Asset Allocation and minimize taxes with Asset Location. By allowing the AA to decide AL, tax savings are ignored. This school of thought has never measured the opportunity cost (higher tax) of their resulting AL. No where have they measured any increased AA benefit from their augmented-MVO (over traditional MVO) that would offset the cost of those higher taxes.

Second, their AL is only relevant for those investors using their augmented-MVO process. No where do they justify why their AL conclusions should be relevant for investors who AA using rules-of-thumb or equal weights. There is literature arguing the MVO does not produce superior results, and it required specialized software and databases, so there is little reason for retail investors to use MVO, much less their augmented version.

Third, ignoring the issue of tax-savings, this augmented-MVO for AA depends on the presumption that the tax paid in taxable accounts lowers the risk and return experienced by investors, that it raises investors' risk tolerance.<sup>10</sup> But none of their research has attempted to show that to be the case. It is debatable.

Real life would argue that while investors intellectually appreciate the lower 'after-tax returns' it is the nominal returns that they react to emotionally. It is the investors' emotional reaction that determines their tolerance for portfolio risk.

Taxes are rarely paid from cash in the investment account, so the investor sees no change in value when taxes are paid or recovered. Taxes are paid yearly, long after gains and losses are realized, so their impact would never be in real-time when the emotional response matters. Since there will be no cash flows to trigger emotional responses does this school of thought presume that investors do their own math accruals?

Will investors make calculations of accrued taxes and pencil in notes on their monthly statements to reduce the stated value? Will they reduce their calculations of year-to-date profits by that accrued tax? Will their emotional response to a 20% loss in a taxable account be the same as a 10% loss in a tax shelter account, because intellectually they know they are taxed at 50%? Will their emotional response to an additional 20% loss later in the year be greater because they know it will be taxed at the next lower marginal tax bracket?

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<sup>10</sup> Good overview of past discussion - James William Reichenstein, "Implications of principal, risk, and returns sharing across savings vehicles", Financial Services Review Volume 16 (Nov 2007) ; [http://www2.stetson.edu/fsr/abstracts/vol\\_16\\_num1\\_p1.pdf](http://www2.stetson.edu/fsr/abstracts/vol_16_num1_p1.pdf)

Unlikely. The investor who wants to Asset Locate will view his portfolio as a whole, with all the assets in all the accounts together. He will not be paying attention to the changing values of separate accounts. He will not 'see' any tax impact. What he does not see he will not worry about it.

There are no good reasons to throw away the tax savings possibilities of Asset Location in exchange for an un-proven theoretically superior AA; that has no relevance for investors not using MVO; that does not reflect the actual behavior of investors.

## CONCLUSIONS

Many investors do not bother worrying about Asset Location. They may ear-mark different accounts for different purposes and Asset Allocate each account independently. Others feel that the liquidity of assets in different accounts is more important than maximizing every tax benefit. Others adopt KISS (Keep It Simple Stupid) and re-deploy cash according to their overall Asset Allocation, ignoring Asset Location. When yearly rebalancing is considered, the difference in ending wealth may not be large enough to warrant the complexity of AL.

There are no rules of thumb that apply in all situations. The truly valid rules apply in only limited situations. A deconstruction of the benefits from tax shelter accounts leads to a completely new understanding of how they work, and how to maximize benefits. It is valuable to know that the commonly accepted rules fail to maximize benefits and should not be used.

1. Many say preferentially taxed income should be kept outside TDAs because they believe profits earned inside are taxed at full rates on withdrawal. But the tax paid on TDA withdrawals is an allocation of principal, not a tax on income. It is the repaying of a loan along with all the income earned by that loan. The profits earned in TDAs are never taxed.
2. Some believe that securities with high rates of return should be in TEAs because the resulting larger portfolio in a TDA would create large tax bills on withdrawal. But the payment on withdrawal from TDAs exactly equals the future value of the original reduction in taxes on contribution. It has no cost because it is fully self-financed. If the withdrawal tax rate is higher than the contribution rate then, yes, there would be a penalty, but that situation should not be a basic assumption.
3. Many think the benefit of tax shelter accounts is the difference between after-tax and tax-free profits. So they conclude that income being taxed at the highest rates (usually debt interest) should be inside tax shelter accounts. But percentages don't pay the bills. The objective is to save tax dollars, not tax percentages.. Examples show the rule to be wrong.
4. Others think the benefit of tax shelter accounts is the difference between after-tax and tax-free profits. So they conclude that assets attracting the largest tax dollars (tax efficiency) should be inside tax shelter accounts. But while it is true that tax dollars (the rate of return multiplied by the effective tax rate) measure the benefit of tax shelter accounts in the first year, over time the compounding of benefits will be larger when the rate of return is higher, even when the tax dollars in the first year is lower. Examples show the rule to be wrong.



5. Some believe the tax benefit of capital losses is lost in tax shelter accounts so they conclude that common stocks should be held outside. But taxes on profits in taxable accounts are only paid on net profits over time. The benefits from the tax shelter accounts are also calculated on those same net profits. And no one invests with the presumption that they will lose money over time.
6. Academic work of the past decade is likely to have ignored the objectives to maximize ending wealth and minimize tax.

With only limited rules of thumb the Asset Location decision is time-consuming and technical. The benefits of each asset-type must be measured and compared for each account type, given the individual investor's particulars. Investors should be made aware that general rules may be reversed when a higher tax rate on withdrawal is anticipated. But the procedure need not be calculated each year. Neither the types of securities preferred by an individual, nor their personal tax rates, will change much from year to year.

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