NORTHERN TRUST
ASSET MANAGEMENT

A HORSE RACE AMONG TRADITIONAL, ROTH, HSA, AND 529 PLANS

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Suppose we want to best utilize $100. We could put it to work in a traditional or Roth retirement plan, a health savings account (HSA) or a 529 plan. Which would get the biggest bang for the buck? Let's run a horse race among them. By "traditional" and Roth, we encompass defined contribution (DC) plans broadly, including individual retirement accounts (IRAs) and employer-sponsored plans.

The seemingly simple decision of where to put the $100 triggers multiple tax implications. To a great degree, the tax code determines which horse is faster, which we will see shortly.

Before the race, let's set the basic premises. For simplicity, let's assume these accounts are being used for the purposes that they are designed for and thus ignore the penalties when they are not. That is, the traditional and Roth accounts will be withdrawn to support consumption in retirement (after age 59½), the 529 account pays for college education and the HSA can be invested to cover healthcare costs into the future.

In contrast to the misperception of HSA being only for the immediate need, it can be a long-term investment. This long-term nature is arguably more applicable to the savings after paying for current healthcare; alternatively, as permitted by law, HSA holders could keep medical receipts for decades and ask for reimbursement in retirement after having reaped long-term investment returns.

REVISED to include Tax Cut and Jobs Act of 2017

Basics of Tax Differentials

A traditional DC plan allows participants to make pre-income-tax contributions, defer taxes on investment earnings, and then pay ordinary income taxes on all withdrawals. A Roth plan reverses the order whereby participants pay income taxes on contributions up front

and then accrue returns and make withdrawals without tax obligations. DC plan contributions are subject to Federal Insurance Contributions Act (FICA) taxes for Social Security and Medicare.

Through an HSA, the worker can make pre-tax contributions, accrue tax-free returns and pay no tax on qualified healthcare expenses. Further, HSA contributions are not subject to FICA taxes. These result in a triple tax benefit (or quadruple if income and FICA taxes were counted separately).

For a 529 account, the contributions are after federal income and FICA taxes. Contributions are not subject to state income tax, and investment returns and withdrawals for college education are tax free. Figure A1 in the Appendix highlights the key tax provisions governing these plans.

Marginal Tax Rates

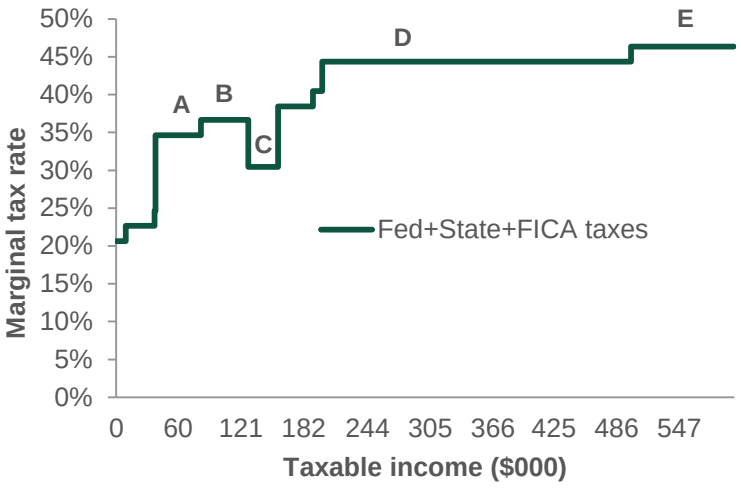
A closer look at FICA taxes is in order. For many workers, these mandatory deductions from their paychecks, also referred to as “payroll taxes”, are 7.65% of earnings – 6.2% for Social Security on earnings up to the taxable maximum ($128,700 in 2018) and 1.45% for Medicare on all earnings. Therefore for higher-earners, the FICA tax is 1.45% for Medicare only on their earnings in excess of the taxable maximum, up to certain thresholds. Under the 2010 Patient Protection and Affordable Care Act, there is an additional 0.9% Medicare tax on worker wages over the statutory thresholds ($200,000 for singles, $250,000 for married couples filing jointly, not indexed). Thus, the marginal FICA tax is increased from 1.45% to 2.35% for these highly-paid workers.

It is also worth noting that the new federal tax brackets under the Tax Cut and Jobs Act of 2017 are used to calculate annualized accumulations in this analysis.

Adding up federal, state and FICA taxes, we have a curve of total marginal tax rates that generally steps up with worker earnings but has a dip for certain wages along the spectrum, as shown in Exhibit 1 for a few illustrative workers A, B, C, D and E. We assume three brackets for state income tax (3%, 5%, and 7%) as an approximation for the wide range of state systems.

Compared to the taxes in working years, federal and state income taxes on withdrawals in the future are assumed to ratchet down by one notch, respectively. Figure A2 in the Appendix gives the specific tax rates assumed for these illustrative workers.

EXHIBIT 1: MARGINAL TAX RATES FOR ILLUSTRATIVE SINGLE WORKERS



NOTES: Marginal tax rates are the sum of marginal federal income tax (brackets 10%, 12%, 22%, 24%, 32%, 35%, and 37% under the Tax Cut and Jobs Act of 2017), state income tax (brackets 3%, 5%, and 7% as an approximation for the wide range of states), and FICA taxes (1.45%, 2.35%, or 7.65%). See text for discussion).

SOURCE: Source: Assumptions by Retirement Solutions, Northern Trust.

Win-Place-Show for a Representative Worker

Let's first run the race for a representative worker (A in Exhibit 1, with earnings of $50,000, roughly equal to the current national average wage). The investment horizon could be 40 years in DC plans and HSA (from age 25 until retirement at 65). The horizon for a 529 is generally up to 18 years, at which point the money is withdrawn for the beneficiary's college education. We assume a constant 5% investment return, for simplicity (implicitly, comparable investments across these plans).

Trumpet sounds, we are off to the races… and here are the outcomes (rankings), as plotted in Exhibit 2:

- HSA always wins out. It reaps the full force of contributions and investment returns given its triple tax exemptions, upfront and afterwards, as long as the fund is used for healthcare.
- Retirement accounts, traditional and Roth, supersede 529 when these accounts have the chance to run their full course (with investment horizons of 40 or 18 years, respectively).
- 529 could beat Roth, when the race is for an equal length of time (18 or 10 years). The reason is that the upfront taxes on Roth cut the horse too lean and it fails to catch up with the state tax exemption that is granted to 529.
- A taxable account – featuring after-tax contributions and after-tax returns – ranks last. It is the least endurable or slowest horse for

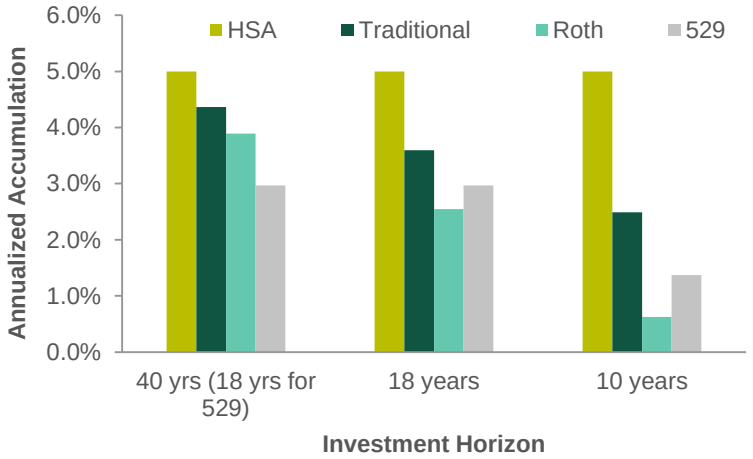
long-term wealth accumulation, and has been eliminated in the qualifying process (thus not plotted in the chart).

So overall, the pecking order to best utilize the pre-tax $100 is:

HSA > Traditional > Roth > 529 for younger workers with many years

HSA > Traditional > 529 > Roth for older workers with shorter horizons

EXHIBIT 2: ANNUALIZED ACCUMULATION, NET OF APPLICABLE TAXES, RELATIVE TO THE INITIAL PRE-TAX $100



SOURCE: Assumptions and calculations by Retirement Solutions, Northern Trust. For illustrative purpose only.

NOTE: The horizon for a 529 Plan is generally up to 18 years, at which point the money is withdrawn for the beneficiary's college education.

A brief clarification: the scoring metrics above have netted out applicable taxes at the end of horse race, divided the resulting balance by the initial pre-tax $100, and derived an annualized pace of wealth accumulation. The calculations thus reflect the tax effect, investment compounding and length of time to fairly measure the consequence of the location choice.

The ranking of traditional vs. Roth could flip if tax rates were expected to go up in retirement than in working years. We have assumed a one notch downward shift of tax brackets here.

Impact of Employer Match

How does it fare if the employers choose to feed the horses, more specifically by matching contributions to the DC accounts? The majority

of corporate plans (81%) match all or part of what employees put into their DC plans.[1]

Assuming that the employer matches 50¢ for each $1 saved by the employees to their DC accounts, the funding priority should be in the following order as indicated by Exhibit 3:

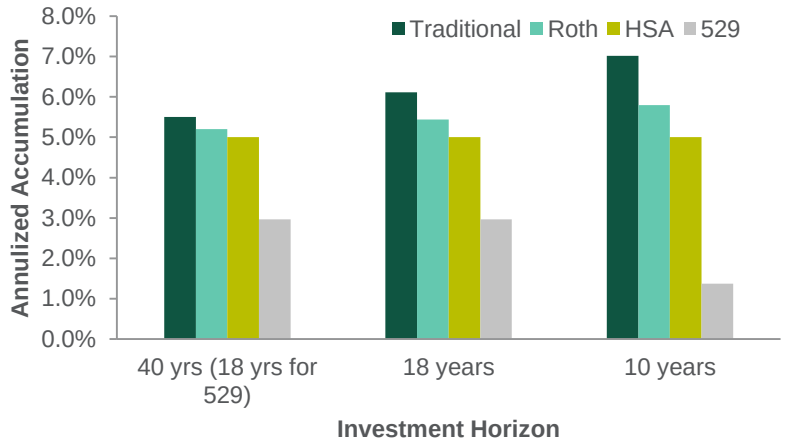
Traditional > Roth > HSA > 529

The employer match has significantly changed the race. The ranking echoes the conventional wisdom that workers should capture the employer match.

Some employers also provide subsidies to HSA accounts. These incentives, however, tend to be small and independent of employees' contributions. Without loss of generality, these healthcare incentives are not critical for our comparison here and thus ignored.

An employer match can significantly change the suggested funding priority.

EXHIBIT 3: ANNUALIZED ACCUMULATION, WITH 50% EMPLOYER MATCH FOR TRADITIONAL AND ROTH PLANS



SOURCE: Assumptions and calculations by Retirement Solutions, Northern Trust. For illustrative purpose only.

NOTE: The horizon for a 529 Plan is generally up to 18 years, at which point the money is withdrawn for the beneficiary's college education.

[1] Northern Trust, 2016, "Survey of DC Plan Participants."

Subtleties for Higher Earners

So, when employer match is on the table, is it always wise to put DC plans ahead of HSA? Not necessarily. It gets more subtle for higher earners.

Let's now run the races for workers B, C, D and E. Again, tax brackets are assumed to shift one notch downward upon retirement. For these stylized workers, here are a few observations as revealed in Exhibit 4.

For the relatively better-paid workers (for instance, making $100,000, less than the Social Security taxable maximum), the priority order is

Traditional > Roth > HSA > 529

It is sensible to use the traditional or Roth account to capture the employer match, before contributing to a HSA. Before the 2017 tax reform, however, the Roth channel even with the match did not beat HSA, perhaps to one's surprise. The ranking was Traditional > HSA > Roth > 529. The main reason was that federal, state and FICA taxes took a significant bite from Roth upfront while HSA savings dodged all these taxes. The tax reform lowered the marginal tax rate applicable to this income level and made the Roth route less punitive than before.

Back to the new tax regime, for workers further up on the pay scale (for instance, making $150,000 –more than the taxable maximum but less than $200,000), the order is

Traditional > Roth > HSA > 529

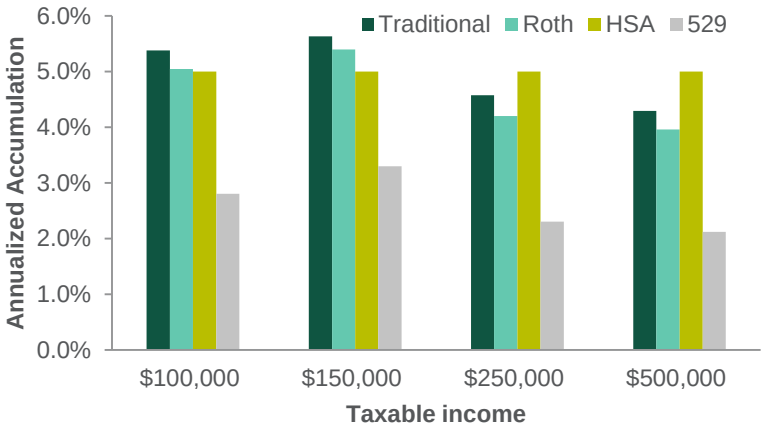
For this range of income, the FICA taxes drop from 7.65% to 1.45%, which makes both traditional and Roth accounts financially more forceful than HSA.

When the worker income is sufficiently high (for instance, more than $200,000 for a single), the horses reshuffle. Even with employer match, traditional and Roth accounts cease to be superior to HSA. The priority order is

HSA > Traditional > Roth > 529

For these workers, the FICA taxes increase again (from 1.45% to 2.35%), and so do the marginal federal and state income taxes. Although tax rates are assumed one notch lower in retirement, the total marginal taxes more than offset the employer match, in comparison with the HSA route. The action of saving in DC accounts invokes high taxes on both employee and employer contributions.

EXHIBIT 4: ANNUALIZED ACCUMULATION FOR HIGHER EARNERS



SOURCE: Assumptions and calculations by Retirement Solutions, Northern Trust. For illustrative purpose only.
NOTE: Assuming a 50% employer match for DC plans and investment horizon of 18 years

A Ratio to Guide the Choice Between DC and HSA

HSA is growing fast as more workers are being enrolled in the high deductible health plans. Assets in HSAs were projected to be more than $53 billion by 2018, in contrast to the actual $1.7 billion in 2006; meanwhile, 49% of HSA owners did not know their money could be invested elsewhere than in low-interest bank deposits.[2] In 2016, only four percent of them had investments other than cash.[3] That is equivalent to using a thoroughbred to plow the farming field.

The recent legislative attempt to reform healthcare had the intent to double HSA contribution limits.[4] The tax advantages make HSA an excellent second (or even primary) retirement vehicle.

So how savings should be prioritized between DC and HSA? We take a traditional DC plan, such as the most common 401(k)s in the private sector, and offer a DC/HSA ratio as a rough measurement. This ratio is the expected ending account balance in DC divided by the expected balance in HSA. A ratio greater than 1 indicates that DC wins out; a ratio less than 1 indicates that HSA wins out; and of course they tie otherwise.

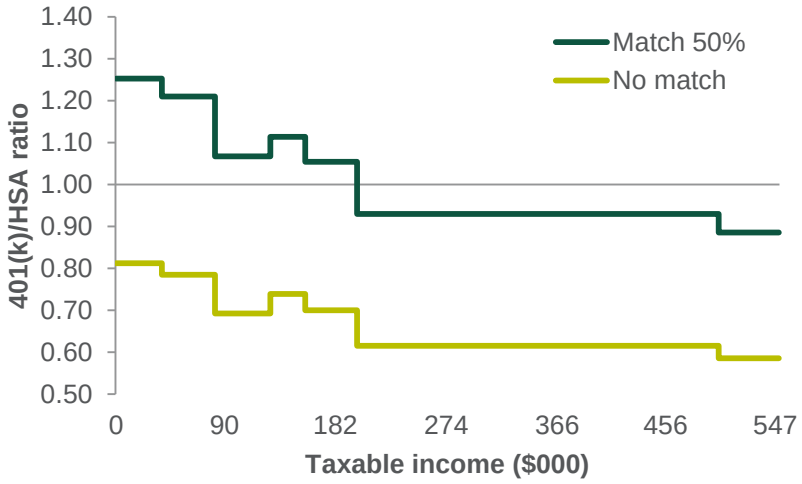
[2] Tom Anderson, May 12, 2017, "Health savings account contributions can boost your retirement," http://www.cnbc.com/2017/05/12/health-savings-account-contributions-can-boost-your-retirement.html.
[3] Paul Fronstin, "Trends in Health Savings Account Balances, Contributions, Distributions, and
Investments, 2011-2016: Statistics from the EBRI HSA Database," EBRI Issue Brief, no. 434, Employee Benefit
Research Institute, July 11, 2017.
[4] "This bill [American Healthcare Act] nearly doubles the allowable contributions to HSAs" by Paul Ryan, March 22, 2017, "Keeping Our Promise to Repeal ObamaCare," Wall Street Journal.

The calculation factors in the effects of taxes and returns, and assumes that the same amount of pre-tax dollars is placed in these accounts for the same investment horizon. The DC/HSA ratio is plotted in Exhibit 5 for a wide range of current worker earnings.

When there is no employer match to 401(k), the ratio is always below 1.0. Therefore, HSA should be the first priority to fund. This holds for all earnings levels. Workers should max out HSA before contributing to 401(k).

When the employer match rate is 50%, most workers ought to fully capture the match before contributing to HSA. However, when worker earnings are high enough (e.g., $200,000 for singles, with the additional 0.9% Medicare tax), the HSA starts to outgrow DC. The high earners are better off funding HSA prior to DC. This is a case where leaving money (employer match) on the table is not necessarily a bad idea. Many highly-paid workers likely have the capacity and desire to max out all the tax-preferred accounts. The above rankings hold true but may end up having no impact on where they put their money.

EXHIBIT 5: A DC/HSA RATIO TO GUIDE SAVINGS PRIORITY – SINGLE WORKERS AS AN ILLUSTRATION



NOTES: When the DC/HSA ratio starts falling below one, marginal tax rates are Federal 32%, State 5%, and FICA 2.35%. Federal and state income tax brackets are assumed to drop by one notch upon retirement. Results may vary with different assumptions.

SOURCE: Assumptions and calculations by Retirement Solutions, Northern Trust. For illustrative purpose only.

The chart above could be used in a dynamic fashion. Workers progress during their careers and their earnings rise, along with higher taxes correspondingly. At each life stage and earnings level, the worker could use Exhibit 5 to weigh the DC vs. HSA routes, as the starting point.

Of course, workers are expected to save more than just $100. When the worker locates the first $100 on Exhibit 5, she deposits it into her DC plan if the DC/HSA ratio is bigger than 1 or into HSA otherwise. Then she works on her second $100, likely moving along Exhibit 5 from right to left. The process repeats so on and so forth until she has exhausted her savings capacity.

Conclusion

U.S. workers have a rich set of plans that they can utilize to manage household finance. They have a limited budget, typically, and thus seek to put their resources to the best use. The financial plans are complex and often perplexing, however, in terms of rules and tax implications.

Going through the maze, and running horse races, we have illustrated that it is generally wise for workers to help themselves out, by saving for their retirement and healthcare, before helping others by contributing to 529 accounts for the benefit of their children or grandchildren.

It is a serious misuse of HSAs if the owners simply treat them as specialized checking accounts. Rather, HSAs can serve well as the second, if not primary, powerhouse of long-term investment. They are tax free for healthcare purposes and can team up with DC plans for general retirement purposes. For most workers, the best option for their money is in their DC plan if they get the employer match. Otherwise, HSA is a better horse, on the condition that investment strategies and costs are comparable in these plans.

For more discussion, contact John Abunassar at JA188@ntrs.com or at 312.630.6594.

Appendix

FIGURE A1: TAX DIFFERENTIALS

	401(k)	Roth	HSA	529	Taxable account
Applicable to contributions?					
Federal income tax		×		×	×
State income tax		×			×
FICA	×	×		×	×
Applicable to invest return?					
Fed & state income tax					×
Applicable to withdrawals?					
Federal income tax	×				
State income tax	×				
FICA					

FIGURE A2: ASSUMED TAX RATES FOR ILLUSTRATIVE WORKERS

Worker	A	B	C	D	E
Income	$50,000	$100,000	$150,000	$250,000	$500,000
Marginal tax rates in working years					
Federal	22.00%	24.00%	24.00%	35.00%	37.00%
State	5.00%	5.00%	5.00%	7.00%	7.00%
FICA	7.65%	7.65%	1.45%	2.35%	2.35%
Total marginal	34.65%	36.65%	30.45%	44.35%	46.35%
Marginal tax rates upon withdrawals					
Federal	12.00%	22.00%	22.00%	32.00%	35.00%
State	3.00%	3.00%	3.00%	5.00%	5.00%

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