

Ceteris Paribus

As fiduciaries we are obligated to act in our clients' best interest. We often answer the call by providing recommendations that are conditional rather than absolute, because as economists we recognize that perfect solutions are rare – more often there are only trade-offs to be evaluated. These trade-offs, furthermore, vary among clients.¹

A lack of concrete answers does not mean analysis is useless. To the contrary, economic reasoning is extremely valuable. It eliminates extraneous considerations and allows one to determine an optimal course of action based on reason, given the uncertainties at hand.

It is the advisor's duty to understand his client's goals and objectives and help form a decision framework built only on relevant factors. We try to clarify the question at hand and identify and isolate all pertinent costs and benefits. In the process we separate emotional considerations – not to discard them, but to encourage clients to recognize them. These crucial "intangible" considerations are usually not measurable. But once acknowledged they can be considered against hard realities, many of which can be quantified with the advisor's assistance.

This month we describe such a framework for homeowners wondering whether to pay off their mortgage ahead of schedule – a decision fraught with challenging trade-offs. We employ several tools of the economics trade. For example, more than once we use the phrase "all else equal" to assess how a single variable among many might affect this decision. Economics is social science – unlike natural scientists we cannot evaluate the impact of changing one variable while holding others constant – we have no Petri dish at our disposal. So instead we use this device (often invoking the Latin phrase "[ceteris paribus](#)") to consider cause and effect.

While prudent investors will be satisfied with this methodology, those looking for a quick answer (e.g., "Pay Down Your Mortgage Now!") will doubtless be frustrated. As a title, that phrase would certainly draw more attention. But we are content to serve a thoughtful, even if smaller, cohort of readers.

There are, unfortunately, predators in our industry who take the opposite tack, by proclaiming certainty in a world of risk and by playing upon the human tendencies of greed and fear. We hope the *Investment Guide* will help you to avoid such gambits.

1. A frustrated President Harry S Truman is said to have exclaimed out of frustration: "Give me a one-handed Economist. All my economists say 'on one hand...', then 'but on the other...'"

Rates of Interest

As of October 19, 2018

Government Obligations¹

Fed Funds Rate	2.19%
3-Month Treas. Bill	2.27%
10-Yr. Treas. Note	3.17%
30-Yr. Treas. Bond	3.36%
10-Yr. TIPS	1.07%
Muni Bonds - Nat'l 10-Yr.	2.75%

Mortgage Rates²

15-Yr Fixed	4.26%
30-Yr Fixed	4.85%

Banking³

Savings	0.09%
Money Market	0.15%
12-month CD	0.47%

[1] Federal Reserve, fmsbonds.com. Annualized Rates. Notes, bonds, TIPS reflect yield to maturity.

[2] Freddie Mac. Average (National average mortgages with 0.5 points).

[3] FDIC. Average national rates, non-jumbo deposits (<\$100k).

WHEN DOES IT MAKE SENSE TO PAY OFF A MORTGAGE?

Workers and retirees might find themselves with “a good problem to have.” Through a lifetime of prudent spending and saving, some have accumulated a cash nest-egg outside of their retirement accounts. We also hear from baby boomers who have received a cash inheritance. Many of these investors are still making mortgage payments and ask: “Should I pay off the mortgage early or instead invest it in my portfolio?”

The answer depends on quantitative factors and personal preference. We can help by providing a framework to clarify the tradeoffs.

What is the Rate?

From a strictly financial standpoint, the analysis boils down to what the mortgage rate is versus what an investor could earn in a portfolio of primarily stocks and bonds. Paying down a loan or mortgage with a 4.5 percent interest rate is effectively the same as investing in a portfolio that guarantees a 4.5 percent return.

For purposes of this article, we will confine our analysis to consider investors with fixed rate mortgages. (See the box below for more regarding variable rate mortgages).

In Table 1 we compare the net present value of paying off a hypothetical

\$100,000 mortgage with 15 years remaining versus investing \$100,000 and continuing to make monthly mortgage payments.

At one extreme, if the subsequent investment return is 3 percent and the mortgage rate is 6 percent, the value of paying off the mortgage today is \$22,192. At the other extreme, if the mortgage rate is 3 percent and the subsequent investment return is 9 percent, the value of payoff is significantly negative, (\$31,914).

The “breakeven” point occurs when the mortgage rate is equal to the subsequent investment return. In those cases the financial value of paying off the mortgage early is zero.

All else equal, the higher the mortgage rate, the more advantageous it is to pre-pay the mortgage. The lower the mortgage rate, the more advantageous it is to invest.

The Known and the Unknown

While you know your mortgage rate, future investment returns are unknown. We suspect that many of our readers have benefited from falling mortgage rates in recent years and hold mortgages with annual rates of 5 percent or less.¹ But the future return from an investment portfolio is unpredictable. Historical

returns are available but are of limited use, particularly over short periods. We contrived Table 1 with a 15-year horizon because a shorter period is especially unpredictable.

Nevertheless, history is all we have. So, to put the hypothetical returns presented in Table 1 into perspective: over 15 years, a “60/40” portfolio of U.S. stocks and bonds would have returned, on average, roughly 9 percent per year. However, there have been 15-year periods with annual returns as low as 2.2 percent and as high as 16 percent.²

Moreover, investors are not bound to a 60/40 allocation, so

one’s risk tolerance factors in on the decision. Aggressive investors willing to assume higher market risk in pursuit of higher expected returns should be more willing than risk-averse investors to invest the extra cash, all else equal. Conversely, conservative investors who are content with lower but more stable market returns may prefer to pay off the mortgage.

Risk Cuts Both Ways

The other fundamental factor to weigh, beyond trying to gauge market risk, is the risk you bear by investing in your home.

By choosing to invest in a conventional portfolio of financial assets you will own assets subject to the fluctuations of stocks and bonds. But paying off your mortgage is risky as well. It entails investing in a single asset – a residential home – and home values are also subject to fluctuations in value. As many homeowners learned during the financial crisis, home values can drop precipitously and stay depressed for several years. Many well-laid retirement plans predicated on accessing home equity ended up on the rocks.

Taxes and Other Considerations

Workers who are not maximizing contributions to tax-deferred or tax-free retirement accounts should consider doing so prior to pre-paying a mortgage. If available, these accounts can reduce current taxes and boost after-tax returns relative to taxable accounts, which makes paying off a mortgage less attractive at the margin.³

Starting this year the standard deduction has been increased. As a result many taxpayers will no longer itemize deductions, including mortgage interest expense. For those homeowners, this change makes the mortgage payoff option more attractive.

There may be other costs associated with holding the mortgage that can make paying off the mortgage more attractive. For example, homeowners with less than 20 percent equity are often required to purchase Private Mortgage Insurance (PMI). For these homeowners, it makes sense to pay down the mortgage in order to increase their equity to at least 20 percent in order to eliminate this cost.

Variable Rate Mortgages and Prepayment

Many homeowners opt for variable rate mortgages with payments that can change when interest rates change.

This complicates the prepayment decision, because the return on the investment portfolio is no longer the only unknown -- the mortgage rate is also indeterminate.

For example, variable rate mortgagors may currently be confronting higher payments as interest rates are rising. While it may seem tempting to use any extra cash to pay off the mortgage to avoid these suddenly-higher payments, it is not clear this is the optimal long-term decision – after all the rate can decline in the future.

The larger question of whether to apply for a fixed-versus variable-rate mortgage is a question for another day; there are numerous trade-offs to weigh. But it is clear that one of the “downsides” of variable rate mortgages is the added uncertainty regarding future payoff decisions.

The Mortgage Payoff Decision: "Rules of Thumb"		
Favors investing extra cash		Favors paying down the mortgage
Lower mortgage rate (< 4%)	Mortgage rate	Higher mortgage rate (> 5%)
Riskier portfolio allocation (more stocks, higher expected return)	Investment portfolio	More conservative portfolio allocation (more bonds, lower expected return)
Willing to tolerate market fluctuations, risk tolerant	Sensitivity to risk	Preference to "lock in" returns, risk averse
More room to invest in tax-advantaged 401(k)s, IRAs, and Roth IRAs	Tax-advantaged accounts	Tax-advantaged accounts are maxed out, must invest in taxable brokerage account
Itemizing taxes, mortgage reduces tax burden	Taxes	Standard deduction, mortgage has no effect on taxes
Not concerned with debt per se, content carrying a mortgage	Personal preferences	Prefer to minimize debt, likes the feeling of owning a house "free and clear"

Personal Preference

In our experience, many investors take great pride and derive enjoyment from owning a home unencumbered by debt. For many this also provides a sense of security. In that case, paying off even a low-rate mortgage can be perfectly rational. The quantitative analysis we have suggested serves only as a framework to put these less tangible considerations in perspective.

Does paying down your mortgage make you happy, even if financial benefits are not apparent? Introspection is necessary, which is not necessarily easy. We have found that married couples sometimes differ on this question. One answer is to "split the difference" – pay down some of the mortgage while investing the rest.

Summary:

The question of whether to pay off a mortgage versus invest in financial assets is most relevant to homeowners with many years (ten or more) remaining on their mortgage.

- As a conservative rule of thumb, homeowners with mortgage rates of 4 percent or less should pay off their mortgage early only if they place an extremely high preference on owning their home outright. On the other hand, pre-paying may well make

sense for investors with mortgage rates of 5 percent or more.

- All else equal, investors who are highly averse to market risk should favor paying off a mortgage while risk tolerant investors should favor investing extra cash.
- A home is an investment that carries its own risk. Home prices do not "always go up."
- Workers who have not yet "maxed out" their tax-advantaged retirement accounts should consider doing so before pre-paying a mortgage.
- Tax considerations are important, especially in light of changes to federal income taxes passed into law this year.
- Homeowners should keep in mind that the financial framework provided here is just that – a structure to consider alongside one's personal preferences.

		Mortgage Rate (Annual)			
		3.0%	4.0%	5.0%	6.0%
Investment Return (Annual)	3.0%	0	7,109	14,509	22,192
	4.0%	(6,640)	0	6,907	14,081
	5.0%	(12,673)	(6,464)	0	6,708
	6.0%	(18,164)	(12,345)	(6,290)	0
	7.0%	(23,169)	(17,706)	(12,021)	(6,117)
	8.0%	(27,738)	(22,599)	(17,252)	(11,700)
	9.0%	(31,914)	(27,072)	(22,034)	(16,802)

- Over the ten years ending December 2017, the national average rate on 30-year primary mortgages averaged 4.6% versus 6.8% during the prior ten years. Source: Freddie Mac
- Hypothetical portfolio comprised of 60% S&P 500, 40% U.S. Treasury Notes, rebalanced annually. Compound average annual return (933 rolling 15-year periods beg. Jan. 1926) 8.95%, range 2.22% to 16.03%.
- Traditional 401(k) plans allow employees to contribute up to \$18,500 per year (\$24,500 for workers age 50 and over). IRAs and Roth IRAs allow additional contributions of \$5,500 per worker (\$6,500 for those over age 50), although there are income restrictions.

QUARTERLY REVIEW OF CAPITAL MARKETS¹

Global stock markets provided strong overall returns during the third quarter. Bonds and global real estate were essentially flat. Gold ended down for the quarter and trailed all other asset classes.

Cash Equivalent Assets²

As the quarter drew to a close, the Federal Reserve Open Market Committee announced its third rate hike for the year. The fed funds rate target now stands at 2.00 - 2.25 percent.

The three month Treasury bill began the quarter yielding 1.93 percent and ended at 2.19 percent. The 1-year Treasury bill yield climbed from 2.33 percent to 2.59, double its yield from one year ago.

Price inflation, measured by the non-seasonally adjusted Consumer Price Index (CPI), increased by 0.17 percent during the quarter. Prices of everyday goods, as measured by AIER's Everyday Price Index (EPI) were essentially flat. Over the past twelve months the EPI has increased 2.25 percent while the CPI increased 2.28 percent.

At quarter-end the market was pricing in 10-year inflation expectations of 2.14 percent per year.

Fixed Income

Long term interest rates increased as well. By quarter-end the [yield curve](#) had shifted upward while becoming flatter.

The overall U.S. bond market was flat over the three months, returning only 0.02 percent while both U.S. and foreign short/intermediate term bonds managed a 0.26 percent return. Short-term municipal bonds returned -0.20 percent. TIPS had losses, returning -0.82 percent as real interest rates increased.

At quarter-end, the average 30-year fixed mortgage rate stood at 4.72 percent with 0.5 points.³

Real Estate

U.S. REITs were up slightly during the quarter, returning 1.06 percent while international REITs returned -1.40 percent. Global REITs, which include both U.S. and foreign holdings were essentially flat, with a return of -0.03 percent.

U.S. Stocks

When the third quarter ended, U.S. stocks had turned in a 7.13 percent return. Large cap growth stocks led, with a return of 9.17 percent, outpacing the 5.70 percent return on large cap value shares. Large caps outperformed small

The Market Decline

Since the end of the third quarter global equities haven't fallen sharply. U.S. stocks, which had been holding up well versus foreign markets have not escaped the downturn. Through October 26th the S&P 500 had fallen by 8.8 percent.

Investors should take this setback in stride. To put the market's recent decline in perspective, see [Recent Market Volatility](#) in the [Subscribers Only](#) section of our website.

caps. Small cap value shares returned 1.61 percent.

Our hypothetical HYD model returned 6.88 percent for the quarter. For more detail, see page 78.

Foreign Stocks

Developed market stocks overall eked out a small positive return of 1.31 percent during the quarter, while emerging markets ended in negative territory, registering a -1.09 percent return.

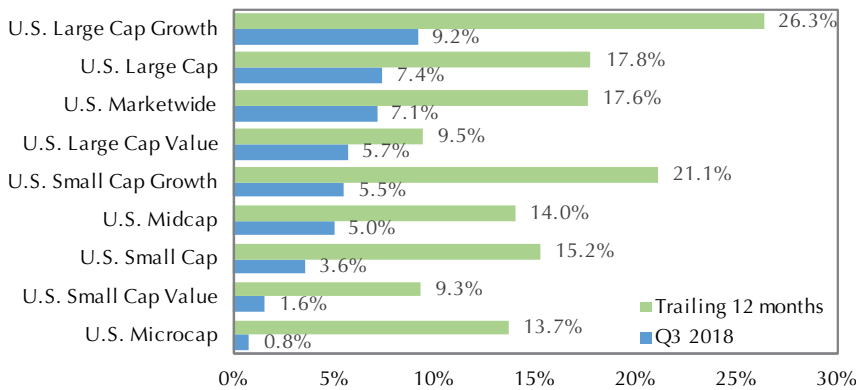
Israel for the second straight quarter recorded the best performance (in U.S. dollar terms) among 23 developed market countries, just outpacing the U.S. Meanwhile Belgium and Ireland posted the lowest returns.

On a trade-weighted basis the dollar was essentially flat against major currencies, gaining [0.15 percent](#) while gaining [1.33 percent](#) against the broad-market index.

Gold

The gold price finished the third quarter at \$1,187 per ounce, for a quarterly return of -5.1 percent. Rising interest rates may have had a negative impact. Gold and U.S. treasuries are regarded as safe haven assets. But treasuries provide interest income while gold does not, so rising rates can shift demand away from gold.

US Equity Returns
Q3 2018 and Trailing 12 Months



1. This article contains information and excerpts from The Vanguard Group, Fidelity Investments, and Dimensional Fund Advisors, as well as data obtained from several index providers.
 2. Sources for cash and equivalent data: U.S. Treasury, U.S. Labor Department (Bureau of Labor Statistics), St. Louis Federal Reserve, EPI: American Institute for Economic Research. EPI, CPI not seasonally adjusted.
 3. Mortgage rates: Freddie Mac

AIS Sample Standard Allocations⁽¹⁾
For the Period Ending September 30, 2018

Asset Class ⁽⁵⁾	Sample Percentage Allocations ⁽²⁾			Asset Class Statistics: Risk and Return (annualized, %)				
	Conservative	Moderate	Aggressive	Total Return				Std. Dev.
				1 Year	5 Year	10 Year	15 year	15 year
Cash & Equivalent Assets⁽³⁾	as needed	as needed	as needed	1.59	0.52	0.34	1.30	0.49
U.S. Inv. Grade Fixed Income	70.00	35.00	15.00	-0.38	1.06	2.30	2.61	1.83
Global Real Estate	2.50	6.00	8.00	2.85	6.33	5.86	7.37	19.17
U.S. Stocks	15.00	36.00	48.00	17.58	13.46	12.01	9.86	13.63
Foreign Stocks	7.50	18.00	24.00	1.76	4.12	5.18	7.20	16.76
Gold Related	5.00	5.00	5.00	-7.05	-2.10	3.03	7.77	17.83
Sample Standard Portfolio Statistics: Risk, Return (%) and Growth⁽⁴⁾								
				Conservative	Moderate	Aggressive		
Portfolio Return 1 Year				1.55	5.62	7.89		
Portfolio Return 5 Year (annualized)				2.52	5.67	7.43		
Portfolio Return 10 Year (annualized)				3.79	6.42	7.69		
Portfolio Return 15 Year (annualized)				4.10	6.44	7.56		
Portfolio Standard Deviation 15 Year (annualized)				4.04	8.60	11.46		
Growth of \$10,000 over 15 Years				\$18,275	\$25,497	\$29,834		

AIS Sample Enhanced Allocations⁽¹⁾
For the Period Ending September 30, 2018

Asset Class	Sample Percentage Allocations ⁽²⁾			Asset Class Statistics: Risk and Return (annualized, %)				
	Conservative	Moderate	Aggressive	Total Return				Std. Dev.
				1 Year	5 Year	10 Year	15 year	15 year
Cash & Equivalent Assets⁽³⁾	as needed	as needed	as needed	1.59	0.52	0.34	1.30	0.49
Fixed Income								
U.S. Short-Term Investment Grade	46.67	23.33	10.00	-0.38	1.06	2.30	2.61	1.83
Foreign Investment Grade (hedged)	23.33	11.67	5.00	1.66	1.70	2.15	2.72	1.10
Real Estate								
U.S. REITs	1.67	4.00	5.33	3.84	9.00	7.41	9.29	22.76
Foreign REITs	0.83	2.00	2.67	3.39	4.18	5.40	7.00	17.37
U.S. Stocks								
Large Cap	5.00	12.00	16.00	17.77	13.67	12.09	9.84	13.39
Large Cap Value	5.00	12.00	16.00	9.45	10.72	9.79	8.89	13.85
Small Cap	2.50	6.00	8.00	15.24	11.07	11.11	10.12	17.88
Small Cap Value	2.50	6.00	8.00	9.33	9.92	9.52	9.50	17.85
Foreign Stocks								
Developed Markets	5.00	12.00	16.00	2.67	4.24	5.18	6.85	16.19
Emerging Markets	2.50	6.00	8.00	-0.81	3.61	5.40	9.65	21.28
Gold Related	5.00	5.00	5.00	-7.05	-2.10	3.03	7.77	17.83
Sample Enhanced Portfolio Statistics: Risk, Return (%) and Growth⁽⁴⁾								
				Conservative	Moderate	Aggressive		
Portfolio Return 1 Year				1.39	4.35	6.00		
Portfolio Return 5 Year (annualized)				2.46	5.22	6.76		
Portfolio Return 10 Year (annualized)				3.64	6.10	7.28		
Portfolio Return 15 Year (annualized)				4.20	6.61	7.78		
Portfolio Standard Deviation 15 Year (annualized)				4.01	8.94	11.98		
Growth of \$10,000 over 15 Years				\$18,536	\$26,138	\$30,746		

1 Performance was achieved by means of retroactive application of a model designed with the benefit of hindsight. Past performance may not be indicative of future results. Therefore, no current or prospective investor should assume that the future performance of any specific investment, investment strategy (including the investments and/or investment strategies recommended by the AIS), or product made reference to directly or indirectly, will be profitable or equal to past performance levels. Historical performance results for investment indexes and/or categories generally do not reflect the deduction of transaction and/or custodial charges or the deduction of an investment-management fee, the incurrence of which would have the effect of decreasing historical performance results. The results portrayed in this portfolio reflect the reinvestment of dividends and capital gains.

2 See back page for a list of investment vehicles that correspond to each asset class.

3 Investors should maintain a cash balance tailored to one's circumstances. Considerations should include anticipated short term spending, an emergency reserve and price inflation.

4 Sample Portfolio Statistics are hypothetical and do not reflect historical recommendations of AIS. Annual portfolio rebalancing is assumed. Sample portfolio returns reflect the deduction of 0.725% management fee, the PAM rate charged to \$500,000 account managed by AIS. A maximum annual management fee for the PAM service of 1.50% applies to accounts of \$100,000 (our minimum account size) in Assets Under Management ("AUM"). The fee decreases thereafter as AUM increases. Accounts with AUM less than \$500,000 would incur a fee greater than 0.725% and, therefore, returns would be lower than indicated. See AIS ADV Part 2 for full details, available at https://www.americaninvestment.com/images/pdf/AIS-Firm-Brochure_31-March-2018.pdf.

THE HIGH-YIELD DOW INVESTMENT STRATEGY

Recommended HYD Portfolio

As of October 15, 2018	Rank	Yield (%)	Price (\$)	Status	—Percent of Portfolio—	
					Value (%)	No. Shares (%) ¹
Verizon	1	4.50	53.60	Holding**	26.62	34.49
IBM	2	4.45	141.13	Buying	23.05	11.34
Exxon Mobil	3	4.06	80.82	Holding**	21.05	18.09
Chevron	4	3.83	116.94	Holding**	15.10	8.97
Proctor & Gamble	5	3.58	80.13	Holding	1.58	1.37
Pfizer	7	3.15	43.12	Selling	11.27	18.15
General Electric	NA	3.77	12.15	Holding	1.33	7.59
Cash (6-mo. T-Bill)	N/A	N/A			0.01	N/A
Totals					100.00	100.00

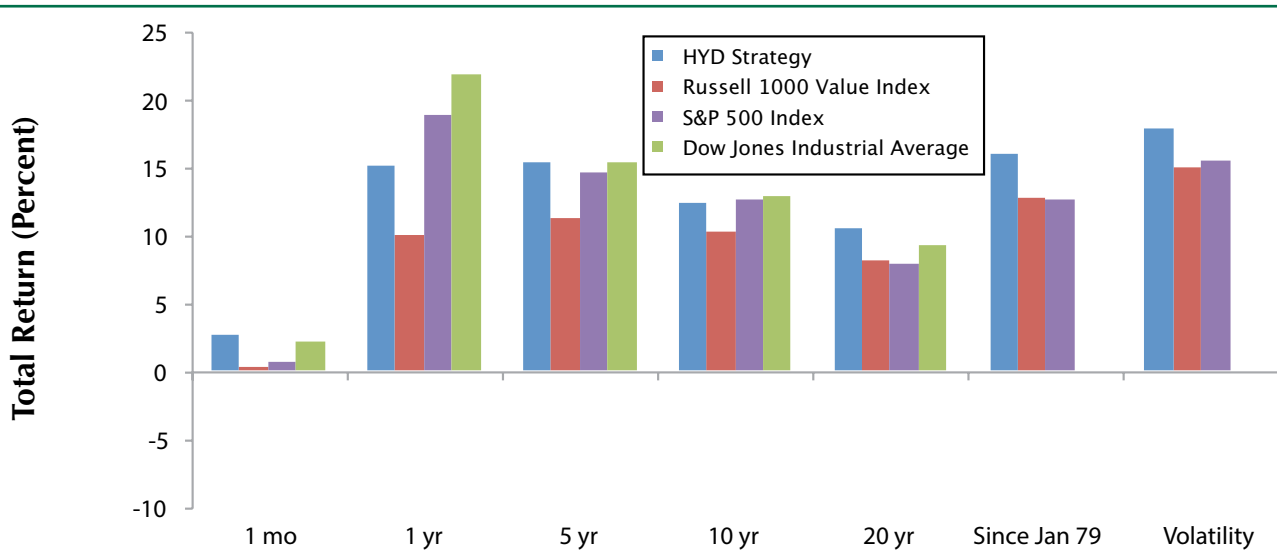
**Currently indicated purchases approximately equal to indicated purchases 18 months ago.¹ Because the percentage of each issue in the portfolio by value reflects the prices shown in the table (closing prices on the date indicated), we are also showing the number of shares of each stock as a percentage of the total number of shares in the entire portfolio.

Subscribers can find a full description of the strategy and methodology in the "Subscribers Only" (Log in required) section of our website: www.americaninvestment.com.

Comparative Hypothetical Total Returns (%) and Volatility

The data presented in the table and chart below represent total returns generated by a hypothetical HYD portfolio and by benchmark indexes for periods ending September 30, 2018*. Returns for the 5-, 10- and 20-year periods are annualized, as is the volatility (standard deviation) of returns.

	<u>1 mo.</u>	<u>1 yr.</u>	<u>5 yrs.</u>	<u>10 yrs.</u>	<u>20 yrs.</u>	<u>since Jan 79</u>	<u>Volatility since 1979</u>
HYD Strategy	2.52	14.36	14.67	11.76	9.95	15.18	17.04
Russell 1000 Value Index	0.20	9.45	10.72	9.79	7.64	12.09	14.31
S&P 500 Index	0.57	17.91	13.95	11.97	7.42	12.00	14.71
Dow Jones Industrial Average	1.97	20.76	14.57	12.23	8.78	N/A	N/A



*Data assume all purchases and sales at mid-month prices (+/- \$0.125 per share commissions), reinvestment of all dividends and interest, and no taxes. Model HYD calculations are based on hypothetical trades following a very exacting stock-selection strategy. They do not reflect returns on actual investments or previous recommendations of AIS. Past performance may differ from future results. Historical performance results for the Russell 1000 Value Index, the Dow Jones Industrial Average and the S&P 500 Index do not reflect the deduction of transaction and/or custodial charges, or the deduction of an investment-management fee, the incurrence of which would have the effect of decreasing historical performance results. HYD Strategy results reflect the deduction of 0.725% management fee, the annual rate assessed to a \$500,000 account managed through our Professional Asset Management service.

Unless otherwise specified returns and data cited within this publication are derived from the following sources: **U.S. stock benchmarks:** U.S. Marketwide - Russell 3000 Index; U.S. Large Cap Stocks - Russell 1000 Index; U.S. Large Cap Value - Russell 1000 Value Index; U.S. Large Cap Growth - Russell 1000 Growth Index; U.S. Midcap Stocks - Russell Midcap Index; U.S. Small Cap Stocks - Russell 2000 Index; U.S. Small Cap Value - Russell 2000 Value Index; U.S. Small Cap Growth - Russell 2000 Growth Index; U.S. Microcaps - Russell Microcap Index. **Fixed income benchmarks:** Cash & Equivalents - ICE BofAML US 3-Month Treasury Bill Index; U.S. Short-Term Investment Grade - Bloomberg Barclays US Government/Credit Bonds Index 1-5 Years; U.S. Bonds - Bloomberg Barclays US Aggregate Bond Index; U.S. Government Bonds - Bloomberg Barclays US Government Bond Index; TIPS - Bloomberg Barclays US TIPS Index; Municipal Bonds - Bloomberg Barclays Municipal Bond Index 5 Years; Foreign Bonds (hedged) - FTSE Non-USD World Government Bond Index 1-5 Years (hedged to USD). **Foreign stock benchmarks:** All returns in U.S. dollars. Developed Markets - MSCI World ex USA Index (net div.); Developed Markets Value - MSCI World ex USA Value Index (net div.); Developed Markets Growth - MSCI World ex USA Growth Index (net div.); Developed Markets Small Cap - MSCI World ex USA Small Cap Index (net div.); Developed Markets Small Cap Value - MSCI World ex USA Small Value Index (net div.); Developed Markets Small Cap Growth - MSCI World ex USA Small Growth Index (net div.); Emerging Markets - MSCI Emerging Markets Index (net div.); Emerging Markets Value - MSCI Emerging Markets Value Index (net div.). **Real estate benchmarks:** Global REITs - S&P Global REIT Index (net div.); U.S. REITs - S&P United States REIT Index (gross div.); International REITs - S&P Global ex US REIT Index (net div.). **Gold benchmark:** Gold London PM Fix Price. All data from DFA Returns 2.0 program, except Gold data from World Gold Council and Currency data from St. Louis Federal Reserve. Country performance provided by Dimensional Fund Advisors, based on respective indexes in the MSCI All Country World ex USA IMI Index (for developed markets) and MSCI Emerging Markets IMI Index. Sector returns represented by S&P 500 sectors.

RECENT MARKET STATISTICS

Precious Metals & Commodity Prices (\$)

	10/15/18	Mo. Earlier	Yr. Earlier	Prem. (%)
Gold, London p.m. fixing	1,229.95	1,201.95	1,299.60	
Silver, London Spot Price	14.74	14.22	17.20	
Crude Oil, W. Texas Int. Spot	71.84	68.98	51.43	

Coin Prices (\$)¹

American Eagle (1.00)	1,254.95	1,226.95	1,324.60	2.03
Austrian 100-Corona (0.98)	1,199.35	1,171.91	1,267.61	-0.50
British Sovereign (0.2354)	289.53	282.94	305.93	0.00
Canadian Maple Leaf (1.00)	1,239.95	1,211.95	1,309.60	0.81
Mexican 50-Peso (1.2056)	1,474.83	1,441.07	1,558.80	-0.54
Mexican Ounce (1.00)	1,247.95	1,219.95	1,317.60	1.46
S. African Krugerrand (1.00)	1,236.95	1,208.95	1,306.60	0.57
U.S. Double Eagle-\$20 (0.9675)				
St. Gaudens (MS-60)	1,220.00	1,230.00	1,255.00	2.52
Liberty (Type II-AU50)	1,325.00	1,325.00	1,325.00	11.35
Liberty (Type III-AU50)	1,169.00	1,182.00	1,230.00	-1.76
U.S. Silver Coins (\$1,000 face value, circulated)				
90% Silver Circ. (715 oz.)	11,843.50	11,843.50	12,047.00	12.38
40% Silver Circ. (292 oz.)	4,821.00	4,821.00	4,716.00	12.01
Silver Dollars Circ.	23,250.00	23,250.00	22,875.00	103.94

¹Premium reflects percentage difference between coin price and value of metal in a coin. The weight in troy ounces of the precious metal in coins is indicated in parentheses.

Recent Market Returns

Data through September 30, 2018

	U.S. Stocks (Mktwd)	Foreign Dev. Stocks	Foreign Emerg. Stocks	Global REITs	U.S. Bonds	Foreign Bonds (hedged)	Gold
1-month	0.17%	0.78%	-0.53%	-2.38%	-0.64%	0.20%	-1.26%
	↑	↑	↓	↓	↓	↑	↓
3-month	7.13%	1.31%	-1.09%	-0.03%	0.02%	0.26%	-5.05%
	↑	↑	↓	↓	↑	↑	↓
1 year	17.58%	2.67%	-0.81%	2.85%	-1.22%	1.66%	-7.05%
	↑	↑	↓	↑	↓	↑	↓
5 year (annualized)	13.46%	4.24%	3.61%	6.33%	2.16%	1.70%	-2.10%
	↑	↑	↑	↑	↑	↑	↓
15 year (annualized)	9.86%	6.85%	9.65%	7.37%	3.78%	2.72%	7.77%
	↑	↑	↑	↑	↑	↑	↑

Best and worst one-year returns, Jan. 2001 - September 2018

Best	56.0%	57.2%	91.6%	85.7%	13.8%	7.1%	57.6%
During:	03/2009-02/2010	04/2003-03/2004	03/2009-02/2010	04/2009-03/2010	11/2008-10/2009	07/2008-06/2009	06/2005-05/2006
Worst	-43.5%	-50.3%	-56.6%	-59.5%	-2.5%	0.1%	-27.4%
During:	03/2008-02/2009	03/2008-02/2009	12/2007-11/2008	03/2008-02/2009	09/2012-08/2013	04/2010-03/2011	12/2012-11/2013

THE DOW JONES INDUSTRIALS RANKED BY YIELD*

Ticker Symbol	Market Prices (\$)			12-Month (\$)		Latest Dividend Amount (\$)	Record Date	Payable Date	Indicated Annual Dividend (\$)		Yield† (%)
	10/15/18	9/14/18	10/15/17	High	Low				Dividend	Yield†	
Verizon	VZ	53.60	54.55	47.86	55.90	43.97	0.603	10/10/18	11/1/18	2.410	4.50
IBM	IBM	141.13	148.33	144.82	171.13	131.83	1.570	8/10/18	9/10/18	6.280	4.45
Exxon Mobil	XOM	80.82	82.92	80.07	89.30	72.16	0.820	8/13/18	9/10/18	3.280	4.06
Chevron	CVX	116.94	117.38	114.63	133.88	108.02	1.120	8/17/18	9/10/18	4.480	3.83
Procter and Gamble	PG	80.13	83.61	93.27	93.14	70.73	0.717	10/19/18	11/15/18	2.869	3.58
Coca-Cola	KO	44.91	45.99	46.18	48.62	41.45	0.390	9/14/18	10/1/18	1.560	3.47
Pfizer	PFE	43.12	42.96	35.36	45.81	33.20	0.340	11/9/18	12/3/18	1.360	3.15
J P Morgan	JPM	106.34	113.50	91.62	119.33	95.95	0.800	10/5/18	10/31/18	3.200	3.01
Cisco	CSCO	44.67	47.40	32.44	49.47	33.45	0.330	10/5/18	10/24/18	1.320	2.96
McDonald's	MCD	163.67	160.84	156.92	178.70	146.84	1.160	12/3/18	12/17/18	4.640	2.83
Merck	MRK	69.46	69.98	66.16	72.89	52.83	0.480	9/17/18	10/5/18	1.920	2.76
3M Company	MMM	198.94	207.88	213.35	259.77	190.57	1.360	8/24/18	9/12/18	5.440	2.73
Intel Corp	INTC	44.53	45.54	37.00	57.60	39.83	0.300	11/7/18	12/1/18	1.200	2.69
Johnson & Johnson	JNJ	133.95	139.49	134.45	148.32	118.62	0.900	8/28/18	9/11/18	3.600	2.69
DowDupont	DWDP	58.94	68.58	69.86	77.08	58.81	0.380	11/30/18	12/14/18	1.520	2.58
Travelers	TRV	123.39	130.01	120.70	150.55	120.74	0.770	9/10/18	9/28/18	3.080	2.50
Caterpillar	CAT	141.80	144.90	121.37	173.24	129.40	0.860	10/22/18	11/20/18	3.440	2.43
Walgreen's	WBA	74.72	70.28	82.50	80.68	59.07	0.440	8/20/18	9/12/18	1.760	2.36
United Tech.	UTX	130.33	137.80	113.08	144.15	115.40	0.735	11/16/18	12/10/18	2.940	2.26
Wal-Mart Stores	WMT	93.82	94.59	80.38	109.98	81.78	0.520	12/7/18	1/2/19	2.080	2.22
Home Depot, Inc.	HD	191.17	209.07	158.40	215.43	160.53	1.030	8/30/18	9/13/18	4.120	2.16
Boeing	BA	358.88	359.80	249.00	394.28	254.50	1.710	8/10/18	9/7/18	6.840	1.91
Microsoft Corp.	MSFT	107.60	113.37	75.31	116.18	77.35	0.460	11/15/18	12/13/18	1.840	1.71
American Express	AXP	102.62	109.56	86.99	111.77	87.54	0.390	10/5/18	11/9/18	1.560	1.52
Goldman Sachs	GS	215.22	229.24	225.22	275.31	210.95	0.800	11/30/18	12/28/18	3.200	1.49
Walt Disney	DIS	113.44	109.26	98.52	118.10	96.89	0.840	7/9/18	7/26/18	1.680	1.48
Unitedhealth Group	UNH	260.25	265.31	198.18	272.81	202.70	0.900	9/7/18	9/18/18	3.600	1.38
Apple	AAPL	217.36	223.84	159.88	233.47	150.24	0.730	8/13/18	8/16/18	2.920	1.34
Nike	NKE	74.99	83.49	53.87	86.04	51.48	0.200	9/4/18	10/1/18	0.800	1.07
Visa Inc.	V	137.23	147.84	105.30	151.56	106.60	0.210	8/17/18	9/4/18	0.840	0.61

† Based on indicated dividends and market price as of 10/15/18. Extra dividends are not included in annual yields.

All data adjusted for splits and spin-offs. 12-month data begins 10/15/17.

ASSET CLASS INVESTMENT VEHICLES

Data as of September 30, 2018	Security Symbol(s) (1)	Avg. Market Cap / Avg. Maturity	Number of Holdings	Expense Ratio (%)	Turnover (%)	Price-to-Book Ratio	Trailing 12-Mo. Yield (%)	Annualized Returns (%)			Tax Cost Ratio - 3 Years (%) (3)	
								1-Year	3-Year	5-Year		
Fixed Income												
Short-Term Bonds	VBISX	2.80 yrs	2530	0.15	50		1.83	-0.50	0.59	0.89	0.67	
Short-Term Bonds	SPDR Portfolio Short Term Corp Bd ETF	2.00 yrs	1111	0.07	67		2.18	0.57	1.48	1.30	0.78	
Short-Term Bonds	iShares 1-3 Year Treasury Bond ETF	1.97 yrs	71	0.15	85		1.47	-0.16	0.23	0.42	0.42	
Interm-Term	Vanguard Total Bond Market	8.40 yrs	17394	0.15	55		2.63	-1.39	1.19	1.99	1.05	
Interm-Term	iShares Core US Aggregate Bond ETF	8.20 yrs	6863	0.05	252		2.51	-1.31	1.22	2.11	1.05	
Tax-Exempt	Vanguard Ltd-Term Tax-Exempt	3.00 yrs	5047	0.19	19		1.74	-0.01	0.94	1.20	0.00	
Tax-Exempt	SPDR Nuveen Blimbg Barclays ST MunBd ETF	3.16 yrs	1418	0.20	32		1.16	-0.74	0.34	0.69	0.00	
Tax-Exempt	Vanguard Interm-Term Tx-Ex Inv	5.50 yrs	7784	0.19	15		2.82	-0.28	1.86	2.91	0.00	
Inflation-Protected	iShares TIPS Bond ETF	8.36 yrs	39	0.20	32		3.03	0.34	1.91	1.23	0.81	
Inflation-Protected	Vanguard Inflation-Protected Securities	8.40 yrs	42	0.20	22		3.20	-0.11	1.93	1.21	0.96	
International	Vanguard Total International Bond	9.40 yrs	5201	0.13	19		2.21	2.22	2.82	3.62	0.78	
Real Estate (REITs)												
U.S. REITs	Vanguard REIT	12.93 B	187	0.26	6	2.40	4.16	1.93	7.56	8.30	1.43	
U.S. REITs	SPDR Dow Jones REIT	12.34 B	99	0.25	9	2.30	3.45	4.39	6.58	8.84	1.58	
Int'l REITs	Vanguard Global ex-US Real Estate (2)	6.36 B	622	0.34	6	0.97	5.01	0.21	7.84	3.81	1.52	
Int'l REITs	iShares International Developed Property	6.77 B	362	0.48	11	0.96	4.81	1.64	6.66	3.91	1.63	
Global (incl. U.S.)	SPDR Dow Jones Global Real Estate ETF	9.71 B	229	0.50	13	1.54	3.73	3.37	5.39	5.86	1.48	
U.S. Stocks												
Large Cap (blend)	Vanguard S&P 500	109.49 B	516	0.14	3	3.15	1.64	18.19	17.94	13.65	0.56	
Large Cap (blend)	iShares Core S&P 500	109.79 B	509	0.04	4	3.21	1.73	17.88	17.28	13.89	0.55	
Large Cap (blend)	iShares Russell 1000 ETF	83.99 B	988	0.15	4	3.14	1.66	17.66	16.92	13.51	0.53	
Large Cap Value	Vanguard Value	98.20 B	342	0.17	9	2.28	2.24	13.69	16.51	12.15	0.72	
Large Cap Value	iShares Russell 1000 Value	61.62 B	730	0.20	15	2.03	2.23	9.32	13.36	10.50	0.66	
Small Cap (blend)	iShares Core S&P Small-Cap ETF	1.87 B	605	0.07	12	2.25	1.19	19.05	19.45	13.31	0.41	
Small Cap (blend)	Schwab US Small-Cap ETF	2.74 B	1766	0.05	11	2.12	1.22	14.52	16.08	11.11	0.45	
Small Cap Value	Vanguard Small Cap Value	3.83 B	856	0.19	19	1.92	1.84	11.16	15.45	11.29	0.62	
Small Cap Value	iShares Russell 2000 Value	1.77 B	1392	0.24	23	1.47	1.77	9.12	16.05	9.82	0.62	
Small Cap Value	iShares Micro-Cap	0.54 B	1460	0.60	22	1.89	0.98	13.72	16.47	10.52	0.38	
Marketwide	Vanguard Total Stock Market	61.44 B	3661	0.14	3	3.00	1.61	17.89	17.68	13.20	0.63	
Marketwide	Fidelity Total Market Index	61.86 B	3380	0.09	2	3.00	1.50	17.93	17.72	13.25	0.91	
Foreign Stocks												
Developed Markets	Vanguard FTSE Developed Markets ETF	23.00 B	3895	0.17	3	1.52	2.88	3.18	10.27	n/a	0.77	
Developed Markets	iShares Core MSCI EAFE ETF	23.89 B	2524	0.08	2	1.57	2.93	2.79	9.63	4.97	0.73	
Emerging Markets	Vanguard Emerging Markets Stock	19.46 B	4097	0.32	6	1.62	2.37	-2.35	10.93	2.60	0.77	
Emerging Markets	Schwab Emerging Markets Equity ETF	30.79 B	968	0.13	7	1.60	2.51	-2.19	10.93	3.45	0.68	
Gold-Related Funds												
Gold ETFs	SPDR Gold Minishares			0.18			0.00	n/a	n/a	n/a	0.00	
Gold ETFs	GraniteShares Gold Trust			0.20			0.00	-7.16	n/a	n/a	0.00	

Data provided by the funds and Morningstar. (1) Some funds are available as mutual funds and ETFs, in which case both symbols are shown. In these cases, data represent the mutual fund. The ETF may offer a lower expense ratio and returns may deviate. For Vanguard funds, the investor share class is shown. The Admiral share class, which has a higher minimum investment, may offer lower expenses. (2) VIGRX includes a 0.25% fee on purchases and redemptions, which are paid directly to the fund. (3) This represents the percentage-point reduction in an annualized return that results from income taxes. This calculation (source: Morningstar) assumes investors pay the maximum federal rate on capital gains and ordinary income.

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