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Financial Literacy: The Basics to Learn in High School

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Financial Literacy: The Basics to Learn in High School

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Abstract:

Humans are capable of not only understanding but operating with certain levels of autonomy to prepare for future circumstances, a fact pivotal to many problems facing society in today's world. Among these problems is the issue of both poverty and financial instability, consequences in part due to a lack of understanding of personal finances in many adults. A partial solution being presented to this issue is the integration and teaching of eight significant finance-related concepts to promote healthier financial decision-making, improve autonomy, and increase long-term happiness in individuals. Rather than covering specific teaching methods, the intent is to demonstrate the importance of these eight concepts and their practicality in relation to everyday finances. A secondary effect of understanding these concepts would also be eliminating the uncertainty which surrounds many young adults and understanding their finances, setting them up for future success in reaching financial goals.

Brief of the Problem:

According to the United States Census Bureau, in 2021 there were approximately 37.9 million people in poverty, or 11.6% of the total population. (Creamer, Shrider, Burns, & Chen, 2022). While each of these individuals have their own circumstances which may have put them there – or else started them in a position of relative poverty – each one may benefit from the understanding of basic financial practices to improve their material livelihoods. Furthermore, in satisfying many of these basic needs an individual's level of depression, stress, and anxiety may decline, leading to a more enjoyable and fulfilling life.

One potential method to expose more individuals to these financial principles would be the implementation of financial curriculum in secondary education as a federal or state requirement not dissimilar to reading, math, and science or social studies. While not inspecting the specifics of how to implement a financial curriculum in relation to education-based teaching practices, instead the aim of this is to examine the principles and concepts necessary or advantageous for individuals to learn. These circumstances are not related exclusively to finance-based activities and expand to those desiring practical benefits like purchasing a

house, having a rainy-day fund, or retiring with adequate funds to avoid poverty post-retirement. With many of the concepts soon to be introduced, the goal is for an individual to become better-equipped for adulthood and many of the financial hurdles that one may face in the future.

Indeed, the livelihoods of many individuals over the course of the last few centuries has drastically improved from a materialist perspective, and the clearest example of the positive social impact would be the average life expectancy for individuals over the course of the last 150 years. In 1860, the life expectancy for an individual in the United States was approximately 39.5 years, while in 2020 the average life expectancy is twice that, at 78.81 years (O'Niel, 2021). Additionally, one may argue the quality of life for everyone is higher, with more access to a variety of food, clean drinking water, and economic opportunities. An individual today will not need to work in agriculture, but instead now can pursue ambitions outside the work of a parent or guardian.

This perspective unfortunately also overlooks factors such as homelessness, poverty, and rampant inflation – all of which pose a barrier to gaining social needs like housing, adequate food, and a sense of security. In 2021 alone, there was an estimated 582,462 reported homeless individuals in the United States, with many more being unaccounted for due to the difficulty in tracking them (US Department of Housing and Urban Development (Office of community planning and development), 2023). In addition, an estimated 37.9 million people (11.6% of the population) is expected to be in a state of poverty in the United States, or making only $12,880 per year for an individual (approx. $35.29 per day) for all basic needs, (U.S. Dept. Health & Human Services, 2023). To clarify, the average consumer spends $66,928 annually ($183.36 per day), over five times as much as the poverty earning power (Bureau Labor and Statistics, 2022).

Additionally, even as poverty and homelessness remains an issue, another issue regarding the financial wellbeing of individuals remains persistent; According to the Pew Research Center, 53% of Americans reported they did not have a rainy day fund that would cover their expenses up to 3 months, with about one quarter of adults saying “they cannot pay some of their bills or can only make partial payment on them in a typical month,” (Parker, Menasce Horowitz, & Brown, 2020). After lockdowns for COVID-19 especially, anxiety over job security was

more acutely felt with an increase in staff shortages and restrictions causing significant workplace changes, causing an increased awareness for those in financial straits on whether they would be able to cover monthly expenses or not.

Beyond the financial or physical impacts of financial inadequacies lies the psychological impact of poverty, especially regarding the additional tax which it entails an individual. In the findings of the American Psychological Association,

> *"Chronic psychosocial stress is gaining recognition as a major mechanism through which poverty exerts a negative toll on children and adults. Ongoing stress associated with poverty, or the stress of living with less than one needs, creates constant wear and tear on the body, dysregulating and damaging the body's physiological stress response system and reducing cognitive and psychological resources for battling adversity and stress," (Wadsworth & Rienks, 2012).*

The carryover effect of poverty from merely a material struggle to a cognitive struggle as well would hamper the experienced livelihoods of many individuals, including the 37.9 million in poverty currently. Additional psychological tolls such as anxiety and depression may also be effects of a perceived socio-economic inequality, with a study from the United Kingdom predicting that "Perceived income inequality predicted adverse mental health and a range of interpersonal difficulties during adolescence, even when controlling for objective family income," (Piera PI-Sunyer, Andrews, Orben, Speyer, & Blakemore, 2023).

The impact expands through multiple disciplines, including economics, health, and psychology, as poverty becomes a leading factor in adverse reactions for each field. Whether it comes down to the inability to pay bills, or the failure to satisfy some essential needs, or the psychological toll taken on an individual when living paycheck-to-paycheck, the disparate impact made causes significant negative effects on not only society, but also on the individual level.

Financial Concepts- Introduction

The issue is a daunting one, that requires a greater societal desire to learn and avoid the pitfalls associated with fiscally smart decision making; It is easier to

succumb to short-term desires compared to the disciplined actions needed to create a better future for oneself. Additionally the field itself is an intimidating one, with many stereotypes of greedy manipulators and bad-faith actors hoarding wealth. Counter-intuitively, those earning more tend to pay more both on a percentage basis and on an absolute gross income measure. The top one percent paid 42.3% of all gross tax income in 2020 (approx. $5.3 trillion of the $12.5 trillion in adjusted gross income), while also having an individual tax rate nearly twice that of the average US citizen (26% compared to 13.6%), (York, 2023). Additionally, those making more pay more in charity each year, with the largest dollar donation amounts equaling $6,000.00 per individual making greater than $162,500 annually. (Philanthropy Round Table, 2016). While not as great of a contribution as potentially available, Charitable giving in the United States in 2021 totaled greater than $480 billion dollars, or about 2% of total Gross Domestic Product (National Philanthropic Trust, 2022).

Additionally, there is one other pretense that needs to be dispelled before continuing: There is no “right time” to begin, nor can one be “too early” or “too late” to begin working towards a more fiscally smart future. For example, an individual who begins investing $150 per paycheck every two weeks, for the next 40 years, will retire with over $3.5 million, assuming an average growth rate of .5% every two weeks, or about 12% average growth per year – a topic to be covered in greater detail further in. Presently, there are certain habits or behaviors that build a foundation for the rest of the material, and form a basis that any individual can implement both within the context of personal finance or outside it.

Section 1 – Habits

“Habits” are defined as “: a settled tendency or usual manner of behavior” as noted by the Merriam-Webster dictionary (Habit, 2023), and are the crux of many basic principles that undergird intelligent financial practices. In the context of personal finance, the habits which one develops with the usage of their money can significantly help or hinder an individual from reaching their goals, while also causing added psychological stress. Instead, the goal is to develop the right habits with finances to promote a healthy and happy financial lifestyle.

Spending < Earning

First among these habits is the heuristic of "spending less than you earn." While a simple concept, in practice it becomes blurred by the craze of everyday expenses. As reported by the Financial Health Network, the percent of surveyed individuals who reported "spending less than or equal to income" dropped to 79%, a "record low." In context, this places 1 in 5 surveyed Americans in a state of spending more than they earn, and going into debt. (Dunn, Warren, Celik, & Chege, 2022).

The best first lesson each individual may learn about financial wellbeing would be to spend less than you make; Evidence of this resonates from major financial institutions adopting "Financial health" services from Budgeting software to tracking purchases based upon categories; Within each of these tools also comes the intuitive guideposts to creating positive goals, with a prime example being part of the Chase mobile app: Underneath the "plan & track" section, one may glance at a spending summary that records monthly data and will subtly remind a user if they are overspending, as compared to tracked income (JP Morgan Chase, 2022). Other banks are also moving in this direction, with the explicit purpose being to aid the general populus in wise financial practices – without impeding the agency of the individual themselves.

Put into practice of a learning atmosphere, the learning of spending less than one earns also puts into mind a state of holding some cash inflow for future usage – an act that compliments an individual's ability to budget. To be able to spend less than one makes requires a certain level of humility as well, as it necessitates an individual to live below their means; A variety of financial advisors and financial influencers home in on this specific point of whether by increasing one's means or decreasing your expenses, it is necessary to make expenses less than income. This application travels beyond finances specifically, as many times it may be beneficial to be able to "say no" when it comes to spending money or making decisions.

Purchasing Habits

Further exploring the topic, the purchasing habits of an individual demand a greater focus, as not only reducing spending becomes important but also the act of being more conscious in spending habits will benefit an individual in the long

term. An example of this would be the intentional spending of money on others, with “both correlational and experimental studies show that people who spend money on others report greater happiness.” Additionally, the reasoning to justify the boost in joy can be explained by a “Self-Determination theory…framework for understanding when and why giving leads to happiness,” (Dunn, Aknin, & Norton).

Increased autonomy as a driver for increased reported happiness levels (Kelley, et al., 2023) demonstrates a desire for individuals to be self-deterministic in choices made; With conscious spending habits leaning into the same desire for autonomy, one can assume that a greater control over decision making in regards to spending habits leads to a greater fulfillment level. This benefits an individual monetarily as well, with the increase in control over spending habits leading inevitably to a lesser outflow of cash and leaving a greater cash balance at the end of the day. Once a habit is formed of creating a surplus of cash value an individual possesses more purchasing power and freedom in purchases, which inevitably leads to more opportunities in the future.

Budgeting

How one can create and notate the progress of adding surplus value at any age would be the formation of a budget. Put simply, a budget allows an individual to track their income and their expenses, allowing for any individual to observe whether one is running at a surplus or deficit of cash at the end of a period. The largest drawback to budgeting would be the necessity to stick close to it, requiring the same conscious spending mindset previously mentioned. With the conscientious steps of thinking about one’s personal finances – what needs to be paid in what amounts during a specific period – the result is often a surplus of cash which then can be allocated to other tasks:

		Notes
		Highlighted amounts are estimates for the month
Pay before Tax	**$ 4,500.00**	
Taxes	$ 1,125.00	Non-Highlighted amounts are exact amounts known for the month
Pay after tax	**$ 3,375.00**	
Expenses		
Rent	$ 1,800.00	Amounts can change over time, & should change to fit circumstances
Car Payment	$ 250.00	
Utilities	$ 50.00	
Food	$ 450.00	Every time spending money should be noted, not just bills; A budget mirrors your spending, not what you should spend
Car Insurance	$ 150.00	
Netflix	$ 19.99	
Gas	$ 200.00	
Fun Expense	$ 300.00	Income - Expenses is the leftover cash that you can assign to other things (saving for vacation or retirement planning)
Pandora	$ 6.99	
Total Expenses	$ 3,226.98	
Income - Expenses	**$ 148.02**	

Above is an example of a simple personal budget that demonstrates just how much could potentially be leftover even with notable expenses like an $1800 rent for one individual, spending $450 for food in one month, and a "fun expense" of $300 to be used for any fun expenses for the month. The end goal is to have a "surplus" of income, avoiding a "deficit," or a negative bottom amount that signals expenses are greater than income.

Further insight into building a budget is also necessary, with the example above exemplifying *one way of building a budget*[1]; What also is necessary to understand is how it comes together, beginning with putting the entirety of the budget in one period that can be repeated, in a period long enough to track. The second thing to note is that **every** expenditure needs to be recorded to accurately understand your financial situation. An unrecorded expense would cause an overestimation and end up with a greater realized deficit long-term. Additionally, within a budget itself is the presence of the "estimates" for variable expenses; These cover any expense whose cost may change over the course – or are

[1] Budgets can be customized to the needs and wants of an individual; Additions of columns or subtractions of existing columns is recommended to match one's financial situation.

otherwise not fixed payments – for the period and are estimated through conservative historical costs (Mint, 2019).

Budgets can also be powerfully effective tools for reaching a quantitative financial goal, whether it involves reduction of debt, increasing savings for an emergency fund, or setting money aside for retirement. This can be done by either taking the surplus value for the period and setting it aside, or by adding an additional expenditure for each period. If a person is saving for a vacation in 5 months that will cost $1,000, "budgeting" in an extra $200 as an expense each month will save that cash each period and equaling enough to afford the trip at the end of the goal. A simple formula to reach this $200 is listed below, with the numerator being the total amount ($1000) to be spent, and the denominator being the periods of time until a person needs the amount:

$$Monthly\ Expense = \frac{Total\ Cost\ of\ (Expense)}{\#\ of\ Months\ until\ Expense}$$

Using a simple formula, one can then get the amount of money to be tucked aside to reach the desired goal over the course of time (Mint, 2019). Not only does this create a plan for being able to afford the desired goal within the budget itself, but also systematically develop one's ability to delay gratification while also learning how to plan.

Section 2 – Uncontrollables

Although there are many things which are within the autonomy of an individual to influence, there are also significant issues that land outside the control of an individual; Because of this reality, the need to understand them becomes even greater as one needs to circumnavigate these "*uncontrollables*" to succeed in their personal finance goals. Once an individual can adapt to the factors out of their control, then those same factors may be used to the advantage of an individual as well.

Depreciation & Appreciation

Depreciation is an accounting principle which acts as a method for devaluing an asset over the course of time. The usage of this asset is often the chief cause for the depreciation, as through usage over time the asset will wear down or become out of date (Merriam Webster Dictionaries, 2023). Albeit

simplified from many depreciation methods, this same principle can be applied to a personal finance perspective: While not depreciating long-term assets (as a business would), depreciation can instead be leveraged to understanding the actual cost of something over time until it breaks.

Example 1		
	Shoe A	Shoe B
Cost	$ 50.00	$ 150.00
Time Lasted (Years)	1	5
Cost / Year	$ 50.00	$ 30.00

Example 1 demonstrates the usage of depreciation per year (labeled as "Cost / Year") to understand how much the product – in this case, shoes – cost each year of use. In this case, the cost / year is what should be considered when purchasing a product. While Shoe A costs less initially, because it lasts only a year necessitates that in a year a new shoe will need to be bought. Contrarily, Shoe B costs more but will last five times as long, leading to only costing $30 per year of its life. Example 2 quantifies exactly how much cheaper Shoe B is than Shoe A, assuming at the end life of each shoe an identical shoe is bought. Over the course of the five years that shoe B lasts, five new Shoes will need to be bought for shoe A, each time paying $50 for it to only last a year. In the end, the total cost over five years for Shoe A is $250, while Shoe B costs $150, making it the cheaper alternative.

Example 2		
	Shoe A	Shoe B
Initial Cost	$ 50.00	$ 150.00
Year 1	$ 50.00	$ 150.00
Year 2	$ 50.00	$ -
Year 3	$ 50.00	$ -
Year 4	$ 50.00	$ -
Year 5	$ 50.00	$ -
Total Cost	$ 250.00	$ 150.00

This concept is not without flaws, as it assumes a specific period; The issue comes when altering the time of purchasing an item, and if not considering when

each item will be fully depreciated, costs may appear or lesser than actuality. Additionally, depreciation requires an understanding of the useful life of a product, an assumption that needs to be made before buying product A or B. Application of depreciation in product purchasing therefore requires experience with the quality, or a historical understanding of the extent to which each product *may* last, estimating a period from that information.

In tandem with depreciation is the ability for assets to potentially gain value over time in a process called appreciation. Unfortunately, appreciating assets are much rarer for individual consumers, however the greatest example would be the purchase and owning of land. Homes are generally considered an appreciating asset as their value over time increases, however the house itself depreciates while the land it's built on appreciates, due to both a constant a shortage of land and an increasing demand for it, the value of the land rises and lifts the listed price (Stammers, 2022) along with it. With this appreciation, an asset will be worth more at the sale than at the purchase, all other expenses from home purchasing and maintenance aside.

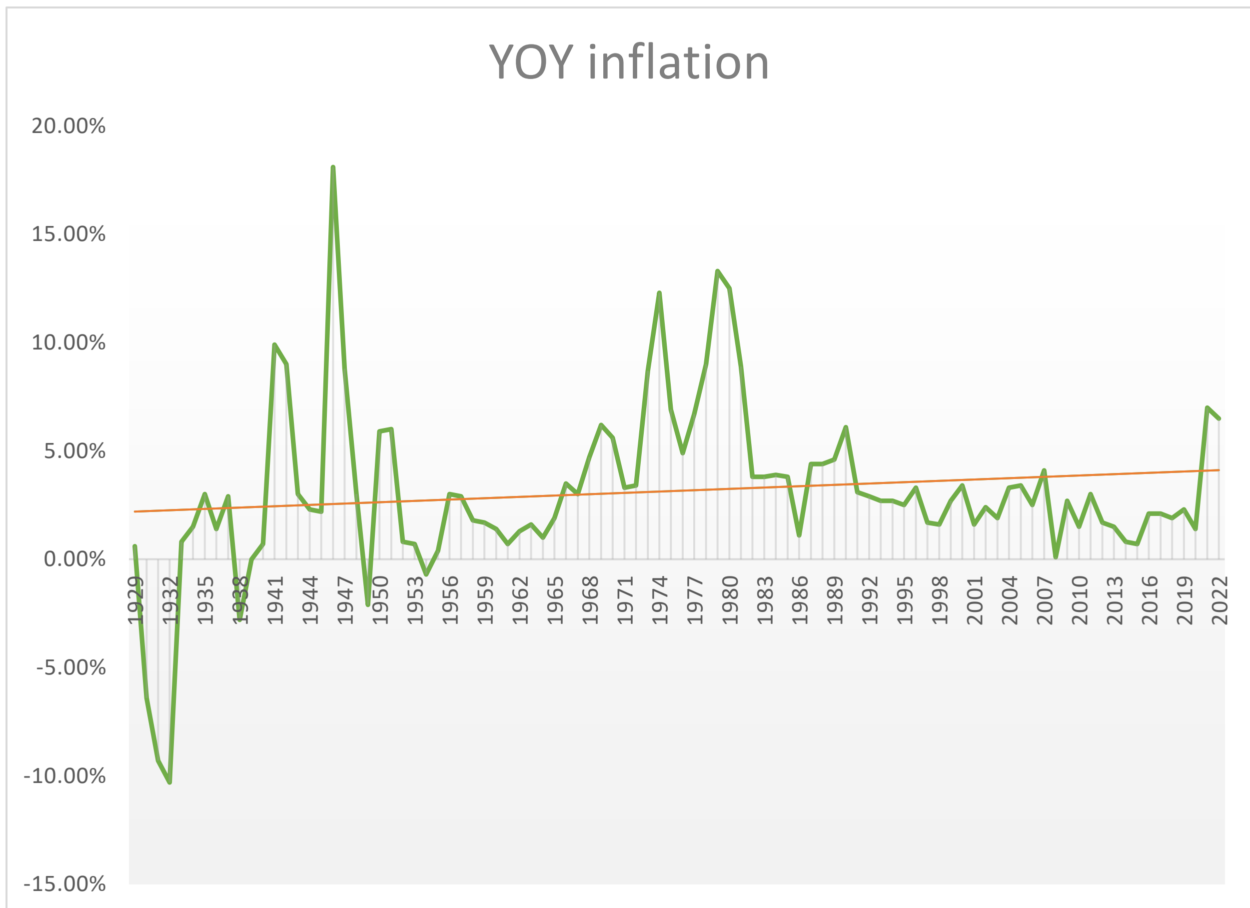
Inflation

Inflation can be simplified into the statement that money loses value over time, similarly to depreciation. Time is not the only factor which affects this inflation rate however, with credit rates set by the federal reserve and government spending on credit playing a core factor in the inflation rate. Inflation is not completely negative, as a healthy inflation rate of about 2% would occur in a scenario where the economy is growing, and the currency value isn't deflating; With a small amount of inflation, the economy maintains a positive growth progression, with wages and prices not falling significantly (The Federal Reserve, 2011).

However, a high rate of inflation does cause economic struggles, with a rapid constant inflation rate – also known as *hyperinflation* – devaluing money at a rate which would make that currency worthless in a brief period. In this circumstance, the economy would go through an event called a "crack-up boom" – coined by economist Ludwig Von Mises in 1912 – which the currency devalues into nothingness, and a new currency is necessary (Mises, 1912). A less extreme outcome is a high inflation rate which prices out many wages and rates of an

individual, making consumer items more expensive but without wages rising enough to match it. In this case – to support an equivalent purchasing power – one would need to find alternative ways of growing wealth, including but not limited to, high-yield savings, Certificates of Deposit, or investments with a return on investment at least equivalent to the inflation rate.

At current, the graph of YOY Inflation[2] gives an example for the variability of inflation over time, with significant domestic and world events impacting the inflation rate; World War Two ending between 1944 and 1947 led to a sharp rise



in inflation at above 15%, before tanking below 0% briefly. The line across the middle of the graph illustrates the slowly rising average year-over-year inflation rate, currently sitting at an average of 3.16% per year[3] (Amadeo, 2023). Overall,

[2] "YOY inflation" represents Year-over-Year inflation rate, or the growth each year of inflation, separate from the prior four quarters. Importantly, YOY inflation does not include or account for prior year inflation, and only includes the devaluing for the year.

[3] Data from US Inflation Rate by Year: 1929-2023 (thebalancemoney.com) sourced originally from Bureau of Labor statistics, "Consumer Price Index Database, All Urban Consumers"

one may understand that inflation – although a potent adversary at times – is widely variable from the mean, and short-term inflation is not an issue; Instead, longer, persistently elevated levels of inflation are chief causes of concern, leading to a greater impact on prices than short term inflation.

What one can do in the face of such inflation rates is little regarding outright prevention, as the reduction of

Boom and Bust – Economic Expansion & Recession

The economy both contracts and expands over time, with factors such as Gross domestic product (GDP), unemployment rates, and monetary inflation rates all being affected by the expansions and contractions.

GDP is a summation of all the economic activity in the United States (Bureau of Economic Analysis, 2023) that can also measure the growth of the economy. This period of growth is often known as an economic expansion or "boom" cycle, and both positive sentiment as well as low interest rates lead to an increase in borrowing and lending activity. It becomes easier to start new companies and technology advances forward as money flows more freely, with this sort of growth being considered long-run economic growth (Chien, 2015). Additionally, as the economy grows, jobs are created and individuals tend to gain opportunities for work, causing unemployment to decline to "full employment" levels (Pettinger, 2021).

Growth of an economy is a positive action; however it also can actively spiral out of control: Because money is flowing more freely, and creditors are able to lend out money at cheaper rates, the value of money decreases as there is more created. In other words, the inflation rate of cash begins to grow out of control due to the low credit rates and will continue to do so until corrected. At this point, the Federal Reserve will begin contractionary policy movement, raising its own discount rate[4]. This one act alone will cause commercial and retail banks to raise their lending rates, making access to credit more difficult and slowing the rate of the flow of money (Columbia University, 2021). A consumer at this point will find the economic opportunities disappearing, as businesses are no longer able to borrow money as freely for development, and unemployment will rise as

[4] Discount rate: The rate which the Federal Reserve loans credit to banks, causing banks to alter their own lending rates based on changes to the discount rate (Estevez, 2023).

GDP slows into a "bust," or recessionary period, as this contraction continues for six months or longer, (Bureau of Economic Analysis, 2023).

At this point, there is nothing a consumer may do, as the metaphoric vaccine has already been administered, and the economic "pinch" felt is a passing occurrence that may last for a few months or a few years. The goal of the individual at this point should be keeping a steady income through one's job, and to continue practicing the healthy financial habits. Understanding the recessionary period before it occurs allows for preventative measures to be taken and will present some incredible opportunities as the contraction begins to end, both of which will be covered under the investments section.

Section 3 – Debt

Debt often may be used colloquially in the negative, however debt itself may be used as a tool that can amplify returns beyond normal scope, or it may conversely cause significant issues for the consumer in multiple aspects. Instead of developing a mindset of debt being always a negative, the goal is to teach an individual the basics of leveraging debt to act as a bonus for the individual while avoiding negative characteristics of debt.

The through-line between all forms of debt is the borrowing of funds for a purchase, and "interest" being added to the "principal" amount, or the amount loaned out in the beginning. Interest acts as an added amount paid to the creditor for loaning money and taking the risk of potentially going unpaid. The payments made each period – until the loan is complete – automatically include an interest percentage in addition to a reduction of the initial amount loaned. The interest rate becomes the most significant factor in debt then, and a general heuristic states that a lower interest rate is always preferred. While not entirely wrong, the period will also determine whether to potentially take higher interest rates to pay less interest in the long-term.

Good and Bad Debt

Simply dividing debt into two categories from the beginning assists in the separation of when to use debt, before characterizing how to use debt in a responsible manner. Put simply, "Good Debt" is the usage of taking out loans to increase wealth or enhance one's life. "Bad Debt" by contrast is the act of taking

out loans on objects for consumption that rapidly depreciate and do not possess a significant enhancement to one's life (Smith, 2023). In short, taking out loans for short term gratification can be considered "bad debt," with good debt being the usage of debt to earn more money.

Exemplifying "good debt" first, purchasing a home is considered a form of "good debt," as not only does the purchasing of property significantly enhance an individual's life, it also is an opportunity for building wealth as property appreciates (see *Depreciation & Appreciation*). In the purchasing of a home, one will take out a "mortgage" or a type of loan that is used for property acquisition or maintenance. A mortgage lasts for a lengthy period of time, with a common mortgage being for 30 years, where the individual will make monthly payments until the principal is completely paid plus interest. (Kagan, 2023) Mortgages are often one of the few types of "good debt" loans for most individuals, however any individual starting a business will more than likely possess loan(s) to support their business activities. While there is added complexity in the process of mortgages, the bottom-line involving mortgages is the benefit of purchasing an appreciating asset can outweigh the cost of debt.

"Bad Debt" on the other hand is characterized as using debt for an individual consumption, without adding positive value to the individual. A clear example of this "bad debt" usage is taking out a loan in order to go on vacation, as the vacation only costs money without any financial return involved; Additionally, as it is consumed it becomes worthless, depreciating instantly while also like out of the budget range of an individual (Smith, 2023). Leveraging debt for purchasing a new automobile often may be considered a form of "bad debt" as the commodity rapidly depreciates and does not pose any sort of significant enhancement to an individual's life, however if purchasing an automobile for work-related opportunities that outweigh the cost then it may be a form of "good debt." Accounting for how it can add value to an individual is the crucial factor to consider when leveraging debt and can help avoid the pitfalls of relying on debt for unwise purchases.

"Good Debt" often becomes associated with many investment and business practices because debt creates more opportunity for growth, something a majority of people fail to account for; An example of how exactly debt can be used

in a positive way is listed below[5] and illustrates how debt can create further opportunities for an individual, compared to waiting and saving without debt. As one can see, there is a shortage of $1000, and without taking out debt, the individual would miss out on earning an extra $850 per year; Additionally, if the individual were to take out the entire amount, they would be paying more in loan amounts, leading to less in the return, however also freeing up the $5000 for other endeavors.

Scenario Summary	
Cash	$ 5,000.00
Investment Cost	$ 6,000.00
Investment Return / Year	15%
Loan	
Interest Rate	5%
Loan Cost / Year	$ 50.00

Debt to Invest Results			
	No Debt	Debt to Cover	Full Investment
Changing Cells:			
Loan Taken Out	$ -	$ 1,000.00	$ 6,000.00
Result:			
Loan Cost / Yr	$ -	$ 50.00	$ 300.00
Net Gain / Yr	Unable to invest	$ 850.00	$ 600.00

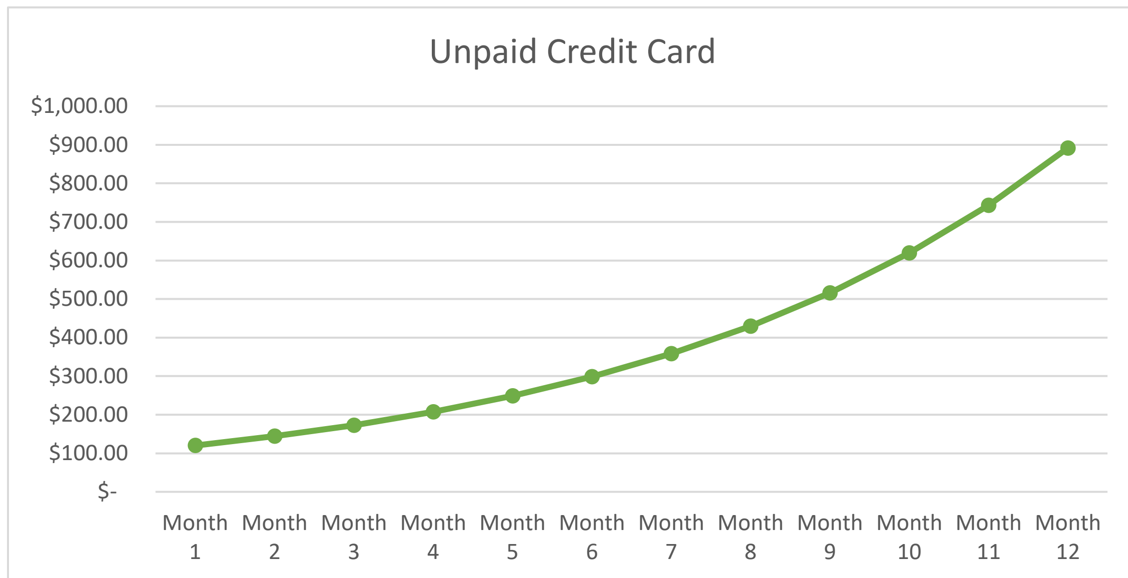
The result of using debt is determined by how debt is used and may aid an individual in their journey towards financial independence; It also becomes easy to abuse debt as a method for purchasing without paying. In such a scenario, the result moves an individual in the opposite direction, instead burdening one with the added obligations, rather than freeing them of it.

Credit Cards

Credit cards are a more involved aspect of debt, as credit cards act as a form of lending; Separate from a debit card – which acts as a withdraw from a deposit or bank account – credit cards instead act as a way of borrowing comparatively insignificant amounts to then pay back at a later point. Credit cards are often used entirely for "bad debt" purchases, however, should not be avoided entirely: Used as a method for building credit for beginners, a credit card can be

[5] Includes information related to Section 4: Investments

an introduction into paying back debt in lesser amounts, instead of beginning with larger lending alternatives. Additionally, many credit cards offer exclusive benefits that can be used for net improvement within certain criteria that apply for all credit cards. First, the balance of a credit card should be paid in full every statement cycle[6], as this will minimize the usage of the card while also avoiding the interest rate of borrowing from a credit card (Bieber, 2021). This interest rate – also known as the Annual Percentage Rate, or APR – often is in double digits, and likely over 20% for newer borrowers; This rate, left to itself, will compound within



a brief period to nearly unmanageable levels, as shown by the initial $100 balance on a credit card left for 12 months. At the end of a year, the card balance is now 9x as large as what it originally was, causing a debt trap for unsuspecting cardholders. Put simply:

> *"Compound interest is the eighth wonder of the world. He who understands it, earns it... he who doesn't... pays it." – Albert Einstein*

Aside from continuously paying off a credit card on time, another requirement for smart card usage is to limit the amount of credit used to at most 30% of the available amount; In practice, this means if the available credit totals to $2000, then at most one should use about $660 on the card; Ideally, one uses less than the 30%, however the 30% acts as a cap before negatively impacting a

[6] Statement Cycle: a 30-day period at the end of which requires a payment to avoid being considered "delinquent" and affecting one's credit score.

credit score (Bieber, 2021). Additionally, as available credit increases, the amount used should stay the same, dropping the total usage of the card. The largest pitfall for many new cardholders comes to both passing the 30% mark, as well as adjusting spending with available credit and spending more than what is budgeted. Altogether, credit cards are a risky endeavor that can only be beneficial if used in a conscious manner and with the solid fundamental habits already in place.

Section 4- Investments

Being the most quantitative of the four sections, investments are also the greatest builder of long-term wealth, providing opportunities in many different applications. Additionally, involvement level can be adjusted to the individual's preferences, allowing for automation or passive investment strategies for those wanting less involvement in the investing process. Regardless of involvement level, there are fundamentals to investing that determine success or failure and require coverage before discussing application.

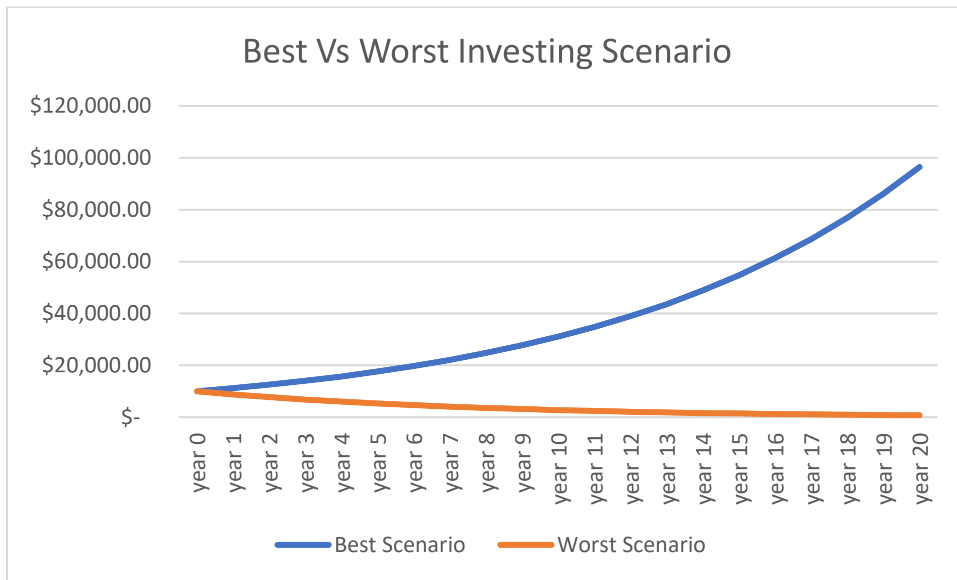
Risk vs. Reward

Chief among the investment fundamentals is the principle that there is a positive correlation between risk level and reward, or profit from the investment. It is vital to understand that as one increases the riskiness of an investment, the possibility of big losses or big rewards goes up too; At this point, an individual must understand themselves and their goals in life, as those goals will help determine what sort of risk profile is right for the individual investor. (Butler, 2022) For those who will need funds in a relatively short period then lower risk options are more preferrable, as they will reduce the risk of losing significant portions of wealth. On the other hand, if the time horizon in which someone can afford to wait is longer, then compound interest can be incredibly beneficial.

Looking at chart below, there are two scenarios which are predicted over the course of 20 years of a $10,000 investment: In the best-case scenario, the investment grows at a rate of 12% per year[7] without any additional investments and becomes worth over $96,000 at the end of 20 years. In the worst-case scenario, the stock loses 12% of its value per year, until being worth only about

[7] Mirroring the average growth rate of the S&P 500, a collection of 500 stocks put together to quantify the growth of the stock market.

$800, or 8%. Of course, the amount difference between the two scenarios is staggering; Because compound interest grows things at an exponential rate, the growth is exponentially increasing, and the losses are being lost at an exponentially decreasing rate. Additionally, with only $10,000 investment, which is the maximum which may be lost, while the growth potential is unlimited in simple investments such as these.



The biggest concern for many involves the fear of losing money, and that concern is warranted due to the very real potential of losing every dime. What is not often understood is the benefit of the potential to grow at a far greater rate than what can be lost. Additionally, the risk of lost capital also needs to be considered; Invested capital should only include the amount which the individual feels can be lost without impacting the budget or bottom line (Butler, 2022). Without also considering how much can be lost as a grounding influence, one may overexert their risk tolerance and lead to significant losses an individual is unprepared for.

Diversification

Diversification is a method of lowering the risk level of an investment profile, an act achieved through holding multiple different investments that have a low profit-loss correlation. In other words, the investments gain or lose money at different rates so in the event one loses value, other investments account for the loss. The tradeoff due to the loss in risk is a loss in potential profit, however the

aim of a well-diversified portfolio is to maintain a growth rate greater than an average growth rate for the year while losing less than an average loss rate for years in which the stock market loses value due to the impact of external factors like an expanding or contracting economic environment (Segal, 2022).

To diversify, not only might companies in different industries be invested in, but also companies of varied sizes and external risk levels should be considered, and even different investment types. For example, the investment of not only stocks[8], but also bonds[9] and even holding different currencies may impact risk rates of an investment portfolio. Calculating diversification of a portfolio requires some advanced statistics beyond the scope of an introduction to personal finance basics, however the concept itself remains both valuable and applicable to beginner investment strategies: By investing in different investments with different risks will reduce overall risk and increase opportunities to lose less money over the course of time. Later, optimizing a portfolio to either minimize risk or have the greatest return rates, an individual can adapt to different circumstances and avoid pitfalls from inflation, expansionary economic conditions, or crises like supply chain shortages, (Ben Abdelaziz & Chibane, 2023).

Time Value of Money (TVM)

Money – like humans – exists within time and is affected by time, a concept touched upon in prior subjects as well. Time value of money as a financial theory then reaches back to each of the other topics and adds a layer of complexity to each of them, as each of the prior topics also require time for growth. What TVM does to complicate matters involves tying inflation of money into the value of money in present and future values based on assumptions about the return rate and inflation rate. Applied, TVM can also optimize portfolios for maximizing returns, like diversification stratagem altering risk levels of a portfolio. Time remains primary in the process throughout, as it still determines compounding interest, although this time in favor for the investor (Young, 2023).

Like diversification, calculating TVM requires complicated formulas to extend for longer than a few years, although the basic formula can be used for short-term benefit:

[8] Stocks: A Share of the equity of a company
[9] Bonds: An issuance of debt by the individual to a company, which the company pays interest to the individual for.

$$Future\ Value = Present\ Value * (1 + interest\ rate)^{Number\ of\ periods}$$

$$Present\ Value = Future\ Value * \ (1 + interest\ rate)^{-number\ of\ periods}$$

Present value is used to understand what the current value of an investment is, with the interest rate being the rate of growth of the investment per period. Periods are often measured in years, quarters, or months to estimate growth rate of the period. Overall, the goal is to accurately understand what an investment is worth in the future, and by using the simple formulas, one can predict the total investment value after a period. The second formula can then revert that Future value back to present dollar value if the investment return rate is exchanged for an estimated inflation rate – which of course reduces the value of money over time (Young, 2023).

TVM can also be applied to make other calculations comparable in one timeframe, including with taking on debt; Take an example of getting an auto loan to purchase a new car worth $20,000; Assuming a monthly payment of $250, and the loan to be for 36 months at .63% per month (about 7.5% APR), we can see that the car loan will be about $35,000 in the future. We can then take that number and find the present value based upon inflation (about 3.16% annually or .26% monthly) to then see that it would only be worth about $32,000 in today's dollars.

Loan Valuation			Present Value	
Initial Cost	$(20,000.00)		FV	$35,086.77
PMT	$ (250.00)		Months	36
Months	36		I%	0.26%
I%	0.63%		PV	$31,917.32
FV	$35,086.77			

The example above demonstrates only the simplest uses of TVM, with many others being capable of finding interest rates, monthly payments, and even the time it would take for money to reach a certain value from compounding. Conceptually, TVM operates as a method for understanding monetary values as they appreciate or depreciate through time, and even without concrete calculations, TVM supports the notion of both appreciation and depreciation of assets, or the compounding returns of investments in today's dollars.

Conclusion

After conceptualizing many distinct aspects of personal finance, the question still may remain as to why everyone should learn these financial principles aside from their financial benefit; Indeed, the benefits from a financial perspective are irrefutable, however the intangible benefit to an increased autonomy through understanding cannot be discounted either. By understanding many of these concepts – even on a basic level – one can make smarter choices and face obstacles which present themselves with the confidence in making an informed decision. Further, this added autonomy and ability to work towards individualized goals asserts the human belief that we can improve our future through delayed gratification, leading to greater happiness and well-being later in life. From this perspective, learning even the basics of personal finance is intensely human, as it not only requires goals but also the sacrifice of enjoyment today for a greater return in the future as well as long-lasting happiness for those in control of their own lives.

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Appendix:

How Many See Personal Finance:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{i,m}(RPM_t) + \beta_{i,sml}(SML_t) + \beta_{i,hml}(HML_t) + \varepsilon_{i,t}$$

What Personal Finance is in Practice:

1. Perfect Positive Habits

2. Eliminate Negative Habits

3. Think About The Future

Before I begin, I wanted to take a bit of time to thank Andrew and his research about an interesting use of neural networks and starting us off on the right note. I will do my best to reach the standard he just set.

The intent behind what I will be discussing this morning– as well as my paper – is to extract and simplify some basic personal finance principles, in an attempt to inform on specific pieces of information everyone should learn in their life. This may be easier said than done, especially because the perception of finance as a whole ultimately appears to many as this top formula; instead, personal finance at its core appears to be much more these three principles: First, one must build positive habits into their lifestyle. Second, one should eliminate the negative habits and unnecessary financial burdens in their life. Third, one needs to begin thinking about what they want in the long-term; In other words, personal finance at its core is all about building good habits in order to make your dreams come true.

The consequences for not learning how to manage one's personal finances may be significant; according to one Pew research study, 53% of Americans are living without an emergency fund, without money put aside in case of an emergency. Now, whether you tragically lose your job, a medical bill comes up - which can cost thousands of dollars out of pocket - or you choose to spontaneously go out for dinner at Canlis restaurant, which may cause an issue on your finances if

you are not adequately prepared. In this regard, personal finance is about how you would like to live your life, regardless of background.

Now, before I delve into what I will discuss today, I lastly wanted to make a quick note that what I discuss is non comprehensive of my paper in its entirety: for example I will not talk at all about the last section regarding investments section today, however if you would like some introductory information regarding investments, you should either talk to a certified financial advisor, or of course read my paper.

Instead, I chose three of my subtopics to cover today as a “flight” of what to expect from my paper. I chose these three subgroups primarily because I believe each is incredibly beneficial to know in its own right. These topics would be at the forefront of advice I would give my own friends and family who are beginning their financial health development and are topics that every banker and financial advisor wishes their clients knew before asking for personal financial advice.

The first of these topics originates from the first section of my paper, labeled the “habits section,” and can be described simply as “spend less than you earn.” Seems obvious on its face, however for the sake of argument, why should you spend less than you earn? Because spending less than you bring in each month means you have money that you can put aside, which increases your savings or your emergency fund and means you have more money put aside for your bigger goals – including

buying a home in the future. This one in particular I believe people my age - the age bracket of 18 to 24 - especially need to learn, as according to the US Bureau of Labor those the age of 18 to 24 are doing the exact opposite, spending more than they earn per year, at about 30k in expenses versus 28k in income. This principle originates and simplifies a business's statement of cash flows, which follows the process of accounting for all the cash which both enters the pocket of the business as well as leaves their pocket, over a period of time. Maintaining this "positive" flow of cash in (versus a "negative" flow out) creates the backbone for every business to grow, a lesson many people can benefit from implementing.

Additionally, beginning early is something that everybody needs to do, as those few years lost can be the difference between tens or sometimes hundreds of thousands of dollars, certainly a significant barrier that will make it harder reaching your desired lifestyle. By contrast, getting the concept of "outflows being less than inflows" down quick means you are that much closer to getting that life you wish you had right now. Personally, that would be being financially free, where money is not a primary issue of stress in my family; Rather, if something were to come up it may be handled without the stress that not just my, but many families associate in regards to managing financial straits.

The next topic I cover is under Section 2 of my paper that I fondly call, "the uncontrollables," or things outside your ability

to control. Specifically, the subtopic I will discuss today is depreciation; Depreciation is an accounting principle used for devaluing long term assets, however I wanted to cover depreciation not in a strict accounting basis, but how applying it to everyday purchases can be beneficial in forward-thinking purchases. Additionally, depreciation introduces the variable of time to valuation in a very simple sense, an important concept to keep in your mind going forward. Now, for example, if you were in the market to buy a new pair of shoes, and you were faced with the choice between a $50 pair and a $150 pair, you likely would buy the $50 pair to save $100. If that is all you can afford without overspending, that would be a wise purchase, however the concept of depreciation can change the math slightly: if that $50 pair of shoes only last for a year, but the $150 pair can last for five years, then under a straight line depreciation (or subtracting each year an equal amount from the price every year), the math works out that you would be paying $30 per year for that $150 pair. Over the same five years, you would be paying $50 for a new pair of shoes every year. In those five years, ultimately you would have saved $100 by buying the more expensive pair of shoes, all because we considered time in the purchasing process, rather than just the short term of today. Concepts that lead your mind towards a forward-thinking mindset are incredibly vital in personal finance because they will be your opportunities to save money in the long run. Of course, we want to save money in the long run

because that means you will have more money in the long run to put for those high-ticket items.

Finally, I would like to cover a portion of my third section covering debt, specifically a brief conversation about credit cards and how to best use them. Now, as I look around, I am willing to bet the majority of you all have at least one credit card; In fact, the average American has nearly three times as many, making credit card management a vital topic to cover. That being said, Credit cards are a big responsibility; It is no mistake that debt is the third section, as it necessitates learning the prior two sections before moving to the third. I recommend using them only when you have understood the prior two sections of positive habit building and understanding uncontrollable factors you will face.

To begin, the worst thing that you can do with a credit card is to not pay it off in full each statement cycle, or about every 30 days. If you do not, then you will likely be charged interest, also called your APR (or annual percentage rate) and is the price you will pay for not paying it off every statement period. It is a percentage rate charged on top of your existing card balance, meaning you will be paying an added percentage of how much you owe, an effect that will continue to snowball getting larger and larger with every month. This effect is commonly called compounding interest, which Albert Einstein has a wonderful quote about, stating that “compound interest is the eighth wonder of the world. He who understands it, earns it, and he

who doesn't, pays it." In this case, you, the consumer would be the one paying it. For a quantitative example, imagine you left $100 on a credit card, and it has a 20% APR, a reasonable APR for many individuals, especially in today's rate market. If left untouched and not added to, in about 10 years it will cost you nearly $900, a nine times increase to that original 100, all because of $100 neglected. If you pay it off each month then of course you will be paying no interest on it to instead glean the rewards without paying the price for using it.

The other part about credit cards which you need to know for today is how much of it you should be using, or rather how much you should not be using. This is called the utilization rate and it is the percentage of your total credit limit which you use before paying it off. Calculating is very simple, by just dividing how much is on the card by the total card limit. The hard upper limit of this utilization rate is 30%; for those of you a bit older you likely already know this number, however regardless of your age you should never cross that 30%. In fact, the rule of thumb is to utilize less; Ironically, by utilizing less then you will be approved for more credit, and it will boost your credit score even more in a positive upcycling trend. This then can then be turned around and used as a better credit score check for larger purchases like houses or auto loans, bringing you that much closer to a lifestyle which you desire. Imagine knowing this when you were in your late teens or early twenties, as compared to likely the decade of…questionable decisions it took to understand. By reaching out to those in school and

explicitly teaching them, we can undercut that decade of decisions to instead put a future generation on a better path in life.

Once again, this is non-comprehensive of even what I covered in my paper, but only three of the highlights that I found important enough to speak on today. With that in mind, I hope you did learn something of the rules that everyone should learn, whether you have $10 or ten million in the bank. To that end, I believe that we all can agree that learning personal finance principles in applicable way like this is incredible beneficial, as we consider many of the financial-related tragedies of our current world, including the poverty, homelessness, and financially precarious situations we each see every day. While better decisions cannot prevent all of life's challenges, it can certainly aid in compounding tragedy and is the goal of personal finance as a whole. Thank you for your time.