From Bricks to Bits

Unmasking Real Estate Investment in the Bitcoin Era

Unmasking the Real Estate Charm

- Even the best-performing areas do not offer significant real estate returns above inflation after considering real estate costs.
- This perspective is further complicated when considering real estate's associated costs, individual investment situations, and the perception of real estate as a sure-fire hedge against inflation.

Liquidity is rarely considered

- Real estate suffers from relative illiquidity and the 'mark-to-market' issue, creating an illusion of stability in its returns.

We ran the numbers

- The hidden (and not so hidden) costs eat away most if not all of the returns.
- We built a comprehensive web app so anyone can run simulations and check the results.

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Epoch IV
Block height 794,180

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"Look, Mom! A waterfall! In our living room!"

The alarm was first sounded by a kitchen island lamp, which began dripping water. My wife, raising her eyes from the strange phenomenon, noticed water cascading down the stairs like a surreal waterfall.

The culprit? Our innocent, bubble-loving five-year-old daughter. Earlier that day, she had decided to indulge in a bubble bath, innocently turning the water on in the upstairs bathroom. Lost in the anticipation of her aquatic adventure, she got distracted and trotted off to join my wife downstairs, leaving a ticking time bomb upstairs.

My phone buzzed and my wife's frantic voice echoed through the line, "The kitchen ceiling is about to collapse!". Swiftly, I dialed the insurance company. Within hours, an emergency crew swarmed our house with massive fans that ran relentlessly, day and night, to ward off the encroaching threat of mold.

The aftermath of this incident was no less daunting. Our once familiar home turned into a construction site, necessitating a temporary move. A new kitchen ceiling was needed, new floors had to be installed. While the insurance company bore some of the costs, it fell short of covering even half of our losses. And there was no clause in the policy to cover the headaches, the stress, and the disruption.

The joys of being a homeowner.

While that episode was certainly a stressful chapter of our homeownership saga, it's not the full story. As is often the case in life, alongside the challenges are moments of immense joy and fond memories. That house, despite its occasional surprises, was also the setting of countless cherished moments.

It was the place where both our children first opened their eyes to the world, their gurgles and giggles echoing through the halls, adding a new layer of warmth and love to the bricks and mortar. Each room of that house held a thousand memories - a whisper of the past.

Owning a home is not just about real estate; it's about creating a safe haven, a personal sanctuary. A home echoes with the laughter of loved ones, absorbs tears during times of sorrow, and celebrates every little victory. Despite the occasional challenges that homeownership brings, there's an undeniable pleasure in calling a piece of this vast world, 'my own.'

However, it's important to distinguish between owning your own home and owning an investment property. The latter brings its own unique set of challenges that can be quite distinct from the former. Owning an investment property means you still shoulder the responsibilities of homeownership - maintenance issues, market fluctuations, financial risks, among others. Yet, the intangible benefits that often make homeownership worthwhile - the joy of making a space truly your own, the memories created within its walls, the sense of security and belonging - these tend to fade in the realm of investment properties.

Instead, the relationship you have with an investment property is predominantly financial. You become a landlord, dealing with tenant issues and property management, often without the personal attachment you'd have to a primary residence. The 'heart' element of a home gets replaced with the 'head' aspects of a business transaction.

In this analysis, our primary focus will be on the financial aspects of real estate investing, an area that typically relates more directly to investment properties. It's an exercise in challenging the common perception that real estate is a fail-safe store of value. Indeed, the prevailing wisdom suggests this to be the case; however, upon closer examination, the data often tells a different story.

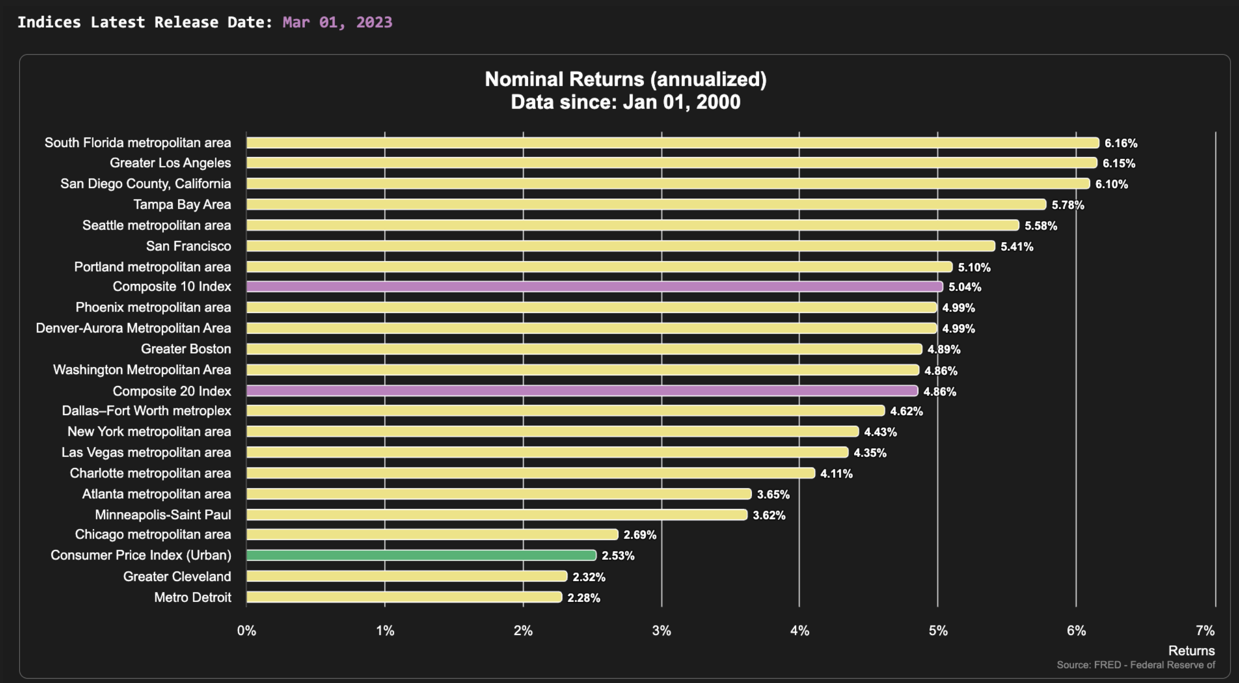
The Illusory Appeal of Real Estate: A Tale of Inflation

The real estate market has a kind of mesmerizing charm, often selling the dream of solidity and steady returns. Yet, the reality can be quite different, especially when we consider the ghost in the room – inflation.

To lay the groundwork, let's first understand some important metrics that we'll use for our comparison.

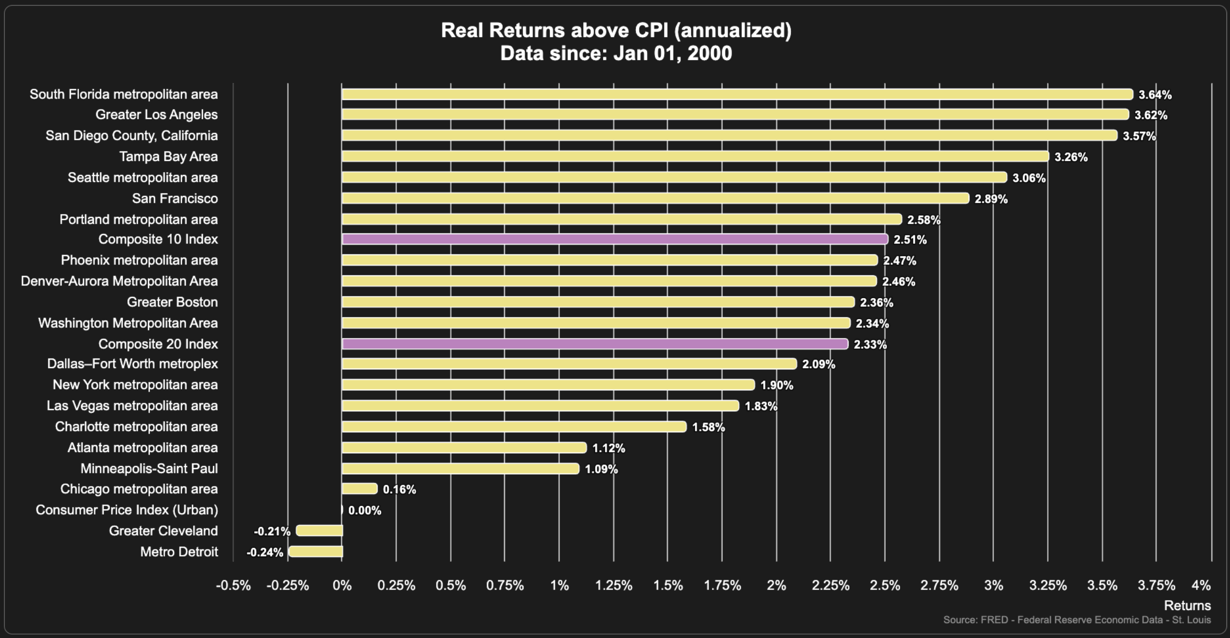
In simple terms, we'll be using two key tools for our comparison. The Case-Shiller Home Price Indices give us an accurate way to track real estate prices, making sure we're comparing similar properties over time. Meanwhile, the Consumer Price Index (CPI) gives us a general idea of how the average price of everyday goods and services is changing, serving as a common, albeit imperfect, indicator of inflation. These tools will help us see how real estate investments stack up against inflation.

As in other research pieces, we've developed a series of open source code and web applications to support the analysis. The first one feeds from the latest CPI and Case-Shiller indices to compare returns.



The chart above summarizes annualized returns since 2000 for each of the indices available. The Composite-10 and Composite-20 indices are meant to be close to US national averages.

No shocker that regions like South Florida have outperformed places like Detroit. What is surprising, though, is how these returns hold up when compared to inflation during the same period. Even the best-performing areas don't offer staggering real estate returns above inflation. The Composite-20, for instance, offered a return of just 2.3% above inflation.



However, this is just the tip of the iceberg, looking only at raw real estate prices. These figures don’t even factor in any of the costs tied to real estate investing, like maintenance, taxes, closing costs, etc. \ In real estate, it is essential to dive deeper and consider all the associated costs that can further eat into these returns.

The situation deepens in complexity when we acknowledge the inadequacy of CPI as a measure of true inflation for homeowners.

The Consumer Price Index (CPI), though widely used, can be a misleading gauge of inflation, particularly for homeowners. CPI generally reflects the average cost of goods and services consumed by households, but it often fails to capture the full scope of expenses associated with homeownership. This is primarily because it doesn't take into account certain elements such as home maintenance, property taxes, insurance, and particularly the rising cost of homes themselves. Moreover, the use of "owners' equivalent rent" in CPI calculations often under-represents the real-world increase in housing costs, because it measures what homeowners might expect to pay if renting their homes rather than the market prices of houses. Thus, homeowners may experience a rate of inflation that's significantly higher than what's reported by the CPI. There are some alternative indices to measure inflation that better represent real costs. Here are some good alternatives: Chapwood Index, Shadow Stats and Truflation.

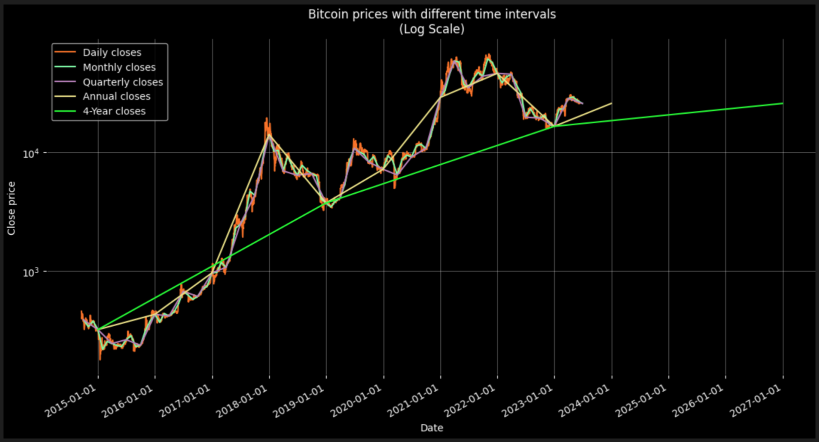
Keep in mind, however, that while the numbers might paint a certain picture, every investor's situation will be unique, influenced by a range of factors from the timing of their investment to the specifics of their property and the area in which it is located. This analysis is meant to challenge the perception of real estate as a 'sure-fire' hedge against inflation, encouraging a more nuanced and informed perspective.

The Liquidity Trap

Let's begin by unpacking the concept of liquidity in the context of real estate. In financial terms, liquidity refers to the ease with which an asset, or security, can be bought or sold in the market without affecting its price. By this definition, real estate is relatively illiquid. Unlike stocks, bonds or bitcoin, you can't sell a portion of your house or instantly trade it in the market. Selling property involves a more extended process with costs such as agent fees, taxes, and potential repair work.

But the liquidity problem extends beyond just the ability to buy and sell quickly. It also manifests in the form of the 'mark-to-market' issue. This term refers to the practice of valuing an investment at its current market value. In the context of real estate, you would only mark your property to market when you sell it, or perhaps if you refinance. This infrequent updating of the value of your investment smoothes out the appearance of its returns over time.

Imagine if we applied the same process to Bitcoin, a notoriously volatile asset. If we only marked Bitcoin to market once a year, its perceived volatility would be much lower. Once every 4-years and it almost looks like it has no volatility. This is the mark-to-market risk



paradox, having a more frequent mark to market may lead to a higher perception of risk.

This inherent lack of liquidity and the inability to frequently mark to market create an illusion of stability in real estate returns. It's important to be aware of this illusion because it can mask the true volatility of the asset class.

Beware of conflicted advice

Real estate agents are key in molding perceptions about property investment, frequently spotlighting its alluring facets. Advocates often underscore the prospective gains in property value, consistent rental income, attractive tax deductions, and purportedly, a buffer against inflation. However, these rose-tinted narratives seldom capture the complex realities, including the fluctuating property appreciation dependent on location, the volatility of rental demand, the burdens of upkeep expenses, or the uncertainty surrounding evolving tax regulations.

While real estate agents are knowledgeable about local markets and transactions, they are not financial advisors. It's important to remember that their incentives might not align with your financial interests due to commission-based earnings. Therefore, it's vital to conduct independent research and possibly consult a financial advisor before making a significant real estate investment, ensuring a balanced understanding beyond the promising yet often unsubstantiated claims.

Your keys, your home?

Asset seizure is not an abstract risk; it is a documented reality, even in the United States. The government holds the authority, via the principle of eminent domain, to confiscate private property for public use. This principle, as stated in the Fifth Amendment of the Constitution, ensures fair compensation for the property owners but can pose considerable inconvenience and potential financial loss.

Historical instances highlighting this power are numerous. In 2005, the city of New London in Connecticut seized private property to boost economic development, a move that was controversially upheld by the Supreme Court. Earlier, the 1831 Cherokee Nation v. Georgia case had significant implications related to property seizures, leading to the notorious "Trail of Tears". In the 1950s, the Berman v. Parker case enabled the government to seize private property in blighted areas for urban renewal. Furthermore, to facilitate the construction of the Interstate Highway System, a series of property seizures took place between 1956 and the present day. And most recently, there are several examples of farmers losing their land for pipelines [1] [2] [3] [4].

Seizure due to unpaid taxes, while different from eminent domain, represents another risk. Local governments can seize and sell properties if homeowners fail to pay property taxes (which they can raise significantly), akin to a foreclosure. Despite these risks, it's essential to note that property seizures, either through eminent domain or tax defaults, are relatively rare when compared to the total number of properties. The U.S. legal system offers robust protections to property owners, necessitating the government to demonstrate a compelling public need and provide adequate compensation for any seizure nevertheless is not a risk to be completely ignored.

Government incentives and policies play a significant role in shaping the real estate landscape. They can both propel and dampen the appeal of real estate investment, and their impact can often be profound and long-lasting.

One of the prime examples of these incentives is tax deductions on mortgage interest payments, which have long made owning a home more financially attractive. These deductions effectively lower the cost of borrowing, making it cheaper for individuals to buy homes. If such deductions were to be reduced or removed entirely, this could result in an increase in the effective cost of homeownership, potentially lowering property values and affecting investors negatively

Furthermore, changes in mortgage rates can also have a profound impact on real estate investment. When mortgage rates are low, borrowing is cheaper, which can spur increased demand for houses, subsequently driving up prices. Conversely, when rates rise, the cost of borrowing increases, which can depress demand and lead to a drop in property values. As mortgage rates are influenced by broader economic policies and conditions, they can be somewhat unpredictable, adding another layer of risk to real estate investments.

Another policy-related risk comes from zoning laws. These laws determine what a piece of property can be used for and can greatly influence a property's value. Changes in zoning, whether to allow higher-density housing or to restrict certain types of development, can dramatically impact property values.

Lastly, we should consider policies related to rent control and tenants' rights. These policies can make it more challenging for property owners to increase rents or remove tenants.

In essence, while government incentives and policies can make real estate ownership more appealing, they also add to its complexity and risk. These factors are often outside an individual investor's control.

Additional Risk Factors

Before we move into some modeling (you knew math was coming), let's highlight some of the other risk factors related to Real Estate.

Ending of Tax Deductions: Many investors count on real estate tax deductions to make their investments more profitable, but these policies are subject to political whim and can change, leaving investors with an unexpected financial burden.

Fluctuating Mortgage Rates: An increase in mortgage interest rates can drastically increase your expenses and decrease your profits. It's important to account for potential rate increases in your financial planning.

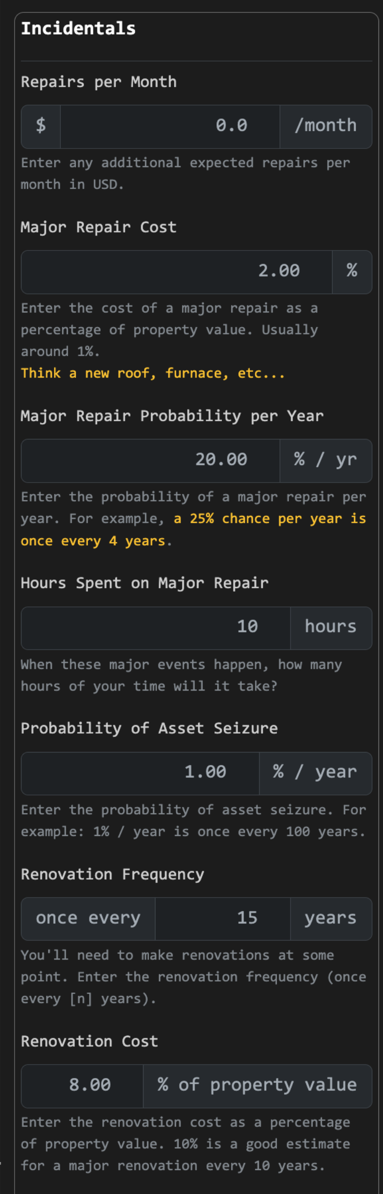
Moving and Selling at a Less Ideal Time: Sometimes, life throws curveballs and you may need to move and sell your property at a less ideal time. This could result in selling the property at a loss.

Natural Disasters: A property can be damaged or destroyed by natural disasters such as fires, floods, earthquakes, or hurricanes. While insurance can cover some of the damages, it often doesn't cover everything, and the process can be stressful and time-consuming.

Tenant-related Issues (for investment properties): Dealing with tenants can bring about unexpected costs, from unpaid rent to property damage, not to mention the legal complexities that might arise from disputes or eviction processes.

Market Fluctuations: Property values can go up and down based on a range of factors, from the overall health of the economy to localized issues. These fluctuations can affect the profitability of your investment.

Maintenance and Unexpected Repairs: Unlike stocks or bonds, real estate requires ongoing maintenance and occasional significant repairs, which can eat into your profits.



Running the Numbers

In this analysis, we took an unconventional approach. Rather than solely relying on historical data, we chose to run simulations. Though past data remains a crucial part of understanding asset behavior, we incorporated numerous simulations to project future outcomes. The primary benefit of this approach is its capacity to factor in a range of events, such as the potential need to replace your roof, or even the off-chance your daughter opts for an indoor waterfall. We then simulate these scenarios to assess their impact on returns. For an example of the parameters we use, see the inputs in the image on the side.

We've also accounted for often-underestimated factors, such as the time dedicated to home maintenance activities. For instance, if you spend between 1 and 2 hours a week on home-related tasks, that's time not spent with your family. Depending

on how you value your time, these hours can accumulate significantly.
You can run your own scenarios here.

For illustrative purposes, we'll consider a $500,000 home purchased with a 20% down payment. We'll also assume that the family plans to reside in this property for the next decade. For the sake of this example, we'll use the National Case-Shiller index as a gauge for home price expectations. Here are the results after running 100 mini simulations.

$808,551	+4.84%	+3.17%
Expected house value in 10 years	Average annual increase in your area based on 23 years of data Composite 20 Index (SPCS20RSA)	Simulated expected inflation rate (annualized) based on historical data FRED:CPIAUCSL

After 10 years, the home's projected value exceeds $800k. On first impression, this seems impressive. People often fixate on this part: "Wow. My 500k home is now worth $800k in 10 years. That's amazing!" However, observe that the forecasted inflation rate (which we also simulated) is 3.17% per annum, while the home's value appreciated by 4.84%, leaving only a +1.67% real return. This doesn't even account for costs. Let's consider some of these.

100	1.0 hours	$28,687
Number of simulations concluded	Average weekly hours expected to be spent on home owning tasks representing an opportunity cost of $496 /week.	Total renovation costs during 10 years. Assuming renovations happen, on average, once every 15 years each costing 8% of property value.
2	**0x**	
Major repairs needed during the 10 years. Each costing $10,000 on average.	Number of times the property was seized	

Next, let's consider other expenses. The table below provides an overview of the expected monthly costs, including maintenance, major repairs, and other fees. To balance things out, we've also factored in certain advantages, such as not having to pay rent and potential tax deductions on interest.

Using the average between all simulations, the following are the expected cash flows

Upfront

Downpayment	$100,000
Closing Costs	$-
* Closing costs of $12,000 are being financed. The total mortgage amount is $412,000.	
TOTAL upfront	$100,000

Monthly Costs
(avg. between all simulations)

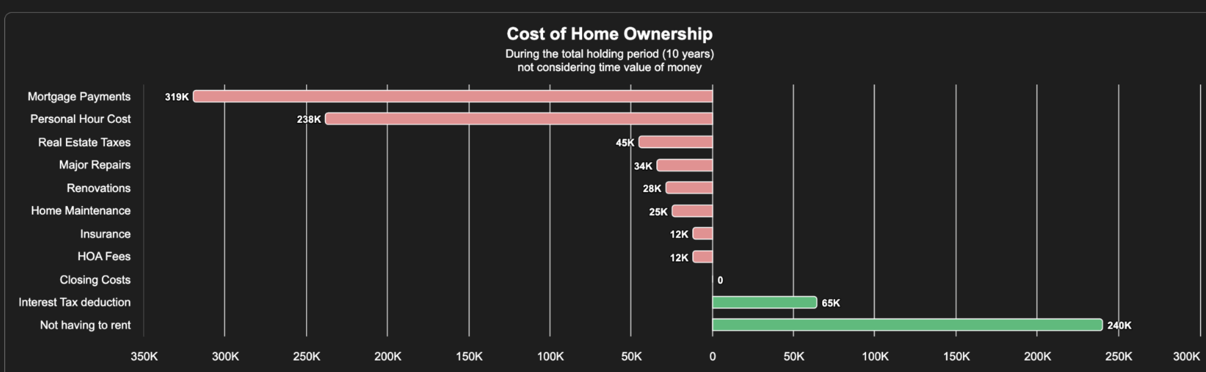
Mortgage Payment	$2,661
HOA Fees	$99
Insurance	$100
Home Maintenance (small repairs)	$207
Major Repairs	$285
Renovations	$237
Real Estate Taxes	$375
TOTAL / month	$3,964
x	120 months
=	$475,645

Opportunity Costs
(monthly)

Not having to rent	$2,000
Interest Tax deduction	$538
Hours Spent	3.97 hours per month
Personal Cost	$1,984
TOTAL / month	$555
x	120 months
=	$66,561

When we factor in all costs, we can calculate the total cost of home ownership.

$500,000	Initial Home Value
$808,551	Forecast Home Value
$409,084	Total cost of home ownership through 10 years This is equivalent of buying 0.82 houses Not considering time value of money
↑ $308,551	Gross PnL
↓ $-100,533	Net PnL



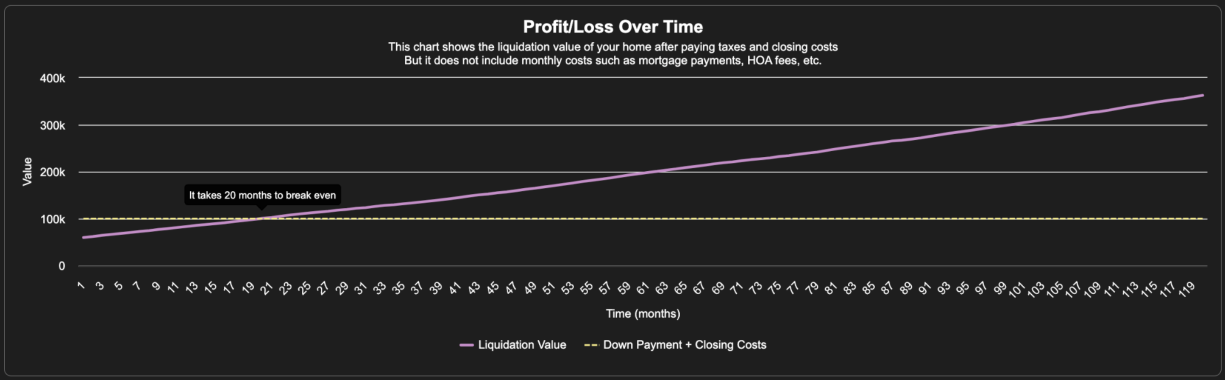
Upon considering all of these elements, the actual cost of home ownership becomes apparent, offering a stark contrast to the "gross profit" that solely considers price appreciation. Furthermore, we find it takes 20 months just to recoup the initial down payment.

$+262,657

This is the mental calculation most people will do when selling their house.
They will compare their final liquidation value to their downpayment.
It leaves out many costs

$-146,427

But this is the PnL after accounting for all costs (see cash flow tab)



In conclusion? You might have been better off stacking sats... Even if we only account for the down payment.

How much would you have made if you had invested in BTC instead?
Note that these are forecasted prices based on historical returns. Most certainly they will be wrong but they are in line with the methodology used to forecast the home value.

BTC

Benchmark used

$26,905

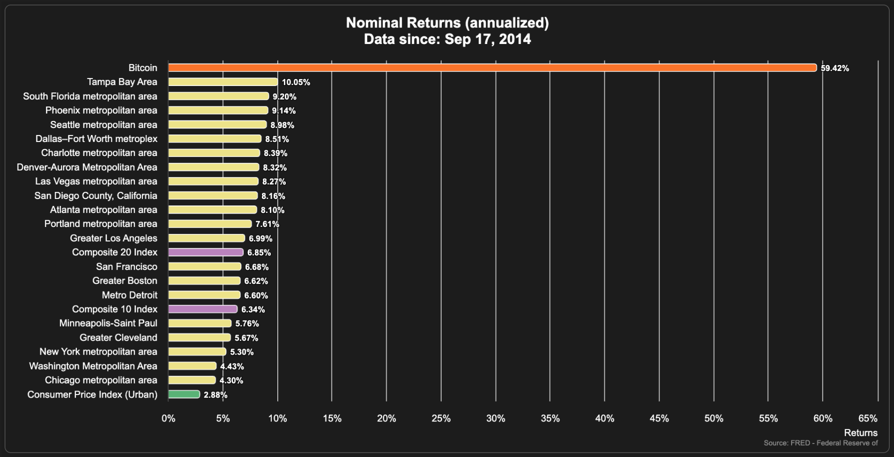
Starting Price

$564,410

10 year forecasted Price using a 50.00% discount on past returns

$2,097,823

Your $100,000 downpayment is forecasted to be worth this amount in 10 years

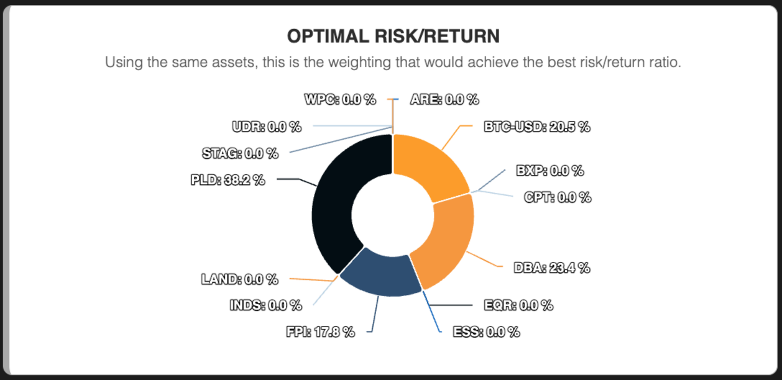


REITs

We'll veer off on a slight tangent here as this is a subject frequently broached by Real Estate investors. I've heard something akin to: "Well… I know Real Estate is fraught with challenges and can be time-consuming. That's why I invest in REITs."

Real Estate Investment Trusts (REITs) are companies that own, operate, or finance income-generating real estate. They allow individuals to invest in portfolios of properties similar to how they would invest in mutual funds or stocks. REITs present a more liquid alternative than owning direct Real Estate, as you can buy and sell shares similar to stocks. Although one could also argue that you don't really own a property but rather an IOU on it.

As REITs are assets that investors typically place in their portfolios, we'll use our portfolio analytics tool to check their performance and whether a Bitcoin allocation could potentially enhance risk-adjusted returns. One of our template portfolios is a diversified basket of REITs that includes office, residential, industrial, and others. Without delving too deeply (this could be a topic for a future research piece), let's analyze the results.

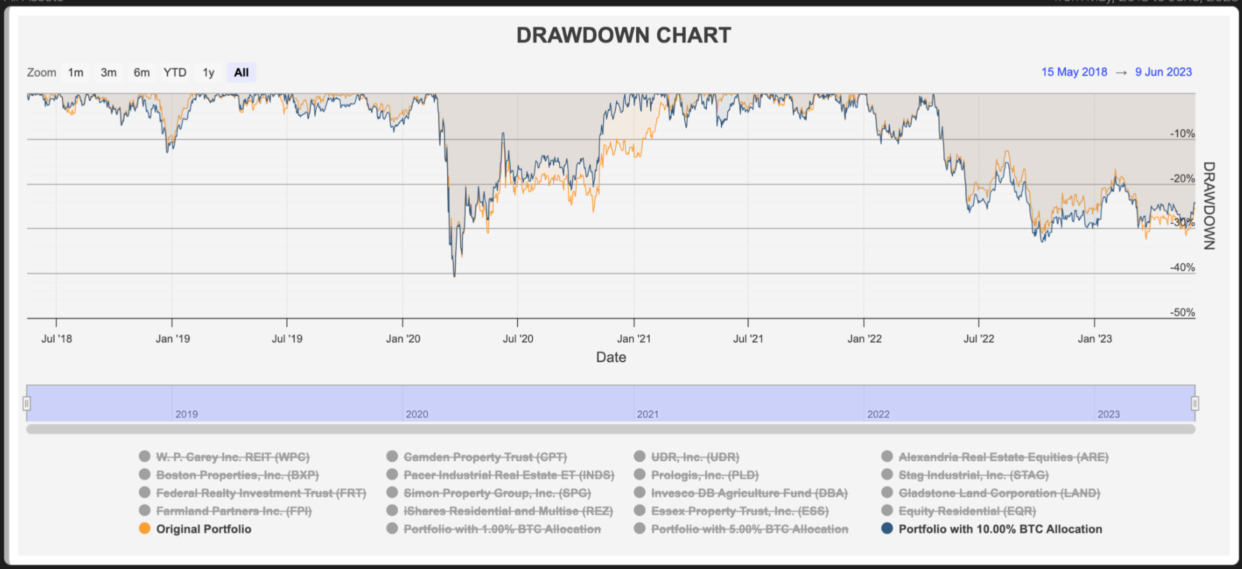


You can review the full results of this analysis here. However, I'd underscore that a Bitcoin allocation could notably improve risk-adjusted returns. In fact, the optimal risk/return portfolio would entail a 20% BTC allocation. Of course, these findings are based on historical returns and should be taken with a grain of salt, but fundamentally, the lack of correlation between the asset classes makes perfect sense.

It's also worth noting that a BTC allocation would have actually reduced the drawdown risk in REITs portfolios in the past, providing further evidence of the lack of correlation.

All Assets

from May, 2018 to June, 2023



Bear in mind that REITs extend far beyond residential real estate. I'll conclude by noting that we believe there is a much higher risk this time around in commercial real estate compared to residential. This is by no means an endorsement of residential real estate, especially given that a credit crunch and price drop in commercial real estate could potentially have a domino effect on all real estate classes.

James Lavish recently published a meticulously organized piece on commercial real estate, which I recommend reading here. The implications for the broader real estate market and regional banks should not be underestimated.

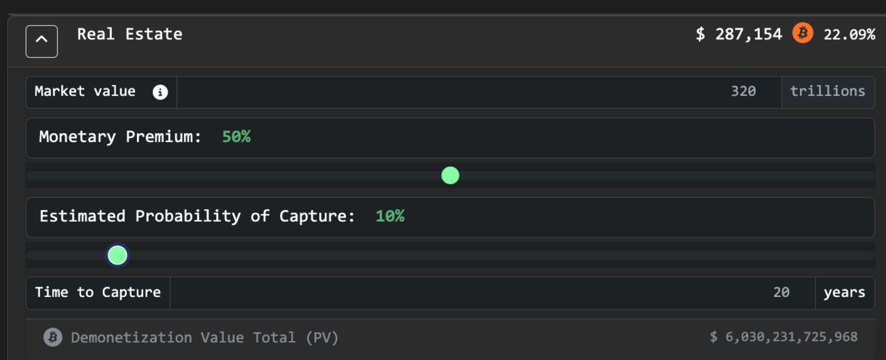
Bitcoin vs. The $300 Trillion Titan

The global real estate market, estimated at a staggering $320 trillion, is heavily influenced by investors who prioritize long-term capital preservation and the store of value. With 50% of U.S. residential properties being non-owner occupied, it is evident that real estate is not just about providing shelter but also serves as a lucrative investment. It's our view that the growth in this market cap is, in part, driven by the lack of a reliable store-of-value asset, rather than a fundamental case for investment.

Commercial real estate investment is also predominantly driven by large asset managers and private equity firms. Firms like Blackrock, known for their active engagement in multi-family purchases, and other entities investing heavily in single-family residences, reflect the growing monetization of real estate by investors not necessarily seeking intrinsic use.

As the investment landscape evolves, real estate risks losing some of its appeal due to emergent asset classes like Bitcoin. As we explored in our "Bitcoin's Schrödinger Model," even a marginal probability of Bitcoin capturing a part of this real estate monetary premium could have a significant impact.

Consider this: a 10% chance of Bitcoin capturing this value over the next two decades justifies a fair Bitcoin price of $280K+ today. You can run this scenario here.



Bitcoiners Run the Numbers
The code used for this article is open-source and available here.
Clone, Fork, modify, verify.