

The Effect of an Elsie Discount on Treble Arbitrage



The module Holding 99 Percent explains how the [Elsie](#) will trade just above 99% of its [peg](#) to the U.S. dollar. The 99% Elsie is taken for granted in earlier modules such as [Parameters of Ground Rent in Early Days](#).

In the absence of retail holders, and by that, I mean any holders of the Elsie outside of the primary market maker, treblers seeking an arbitrage opportunity, the EDSF, incoming rent, and advance rent accounts, the Elsie can fall no lower than 99.05% of the peg. This is called natural demand. The pace of ram and jam prevents the Elsie supply from exceeding natural demand.

For the Elsie to fall below 99%, retail holders must purchase Elsies and then sell them at a loss!

An Elsie scare, a government crackdown, or the bankruptcy of a large Elsie holder could lead to a fall below 99%. AFFEERCE may be the next big thing for a year or two, and then the public's short attention span moves on to something else. Elsies are dumped on the market in favor of the new AICryptoBorg. This is neither unexpected nor problematic.

This module explains the [trebler's](#) [arbitrage opportunities](#) as a function of Elsie's discount to the peg.

Treble-danger point (4.61%) for a property in Denver, CO, at 99% of peg

These are the parameters used in the following simulations – The Elsie or VIP\$ as a percentage of peg (**in red**) changes, as does land share at the top. Ground rent as a percentage of land value (line 8) is set manually to the smallest possible [treble-safe](#) value.

In this run, the Elsie has the standard 1% discount at 99% of the peg. The land share is a high 60%, and the lowest safe ground rent is 4.61% of land value (\$420,000).

Is Property Safe From Trebler?	User Entered	Computed	
Land Share	60.00%		
Purchase Price	\$700,000		
Mortgage Rate	5%		
Land Appreciation	0%		
Structure depreciation	0%		
Land Value at start		\$420,000	
Structure value at start		\$280,000	
Ground Rent as percent of land value	4.61%	\$19,362	
Property Tax percentage	0.5%	\$3,500	
Bank down payment percent	20%	\$140,000	
Closing costs on title acquisition	2%	\$21,000	
Fees on bank loan	1%		
Bank loan term (months)/Total Down Payment	240	\$161,000	
Bank loan principle		\$560,000	
Treble 33.33% structure premium		\$92,400	
Trebled rent		\$57,505	
Loan fees on structure		\$2,772	
VIP\$ as percent of peg	99%		
Trebler down pymt = premium + 1 yr advance		\$152,677	
Higher/Lower down payment for Trebler		-\$8,323	
Monthly standard mortgage payment		\$3,696	** Treble Safe **
Total monthly payment for standard bank loan		\$3,987 = \$3,696 + \$292	
Bank loan to trebler on structure - monthly		\$1,829	
Interest on excess down payment		(\$416)	
Average Monthly Rent Refund		(\$159)	
Trebler monthly ground rent at start		\$4,792	
Midpoint rent		\$2,739	
Total monthly payment for trebler		\$3,993 = \$1,829 + (\$416) + (\$159) + \$2,739	

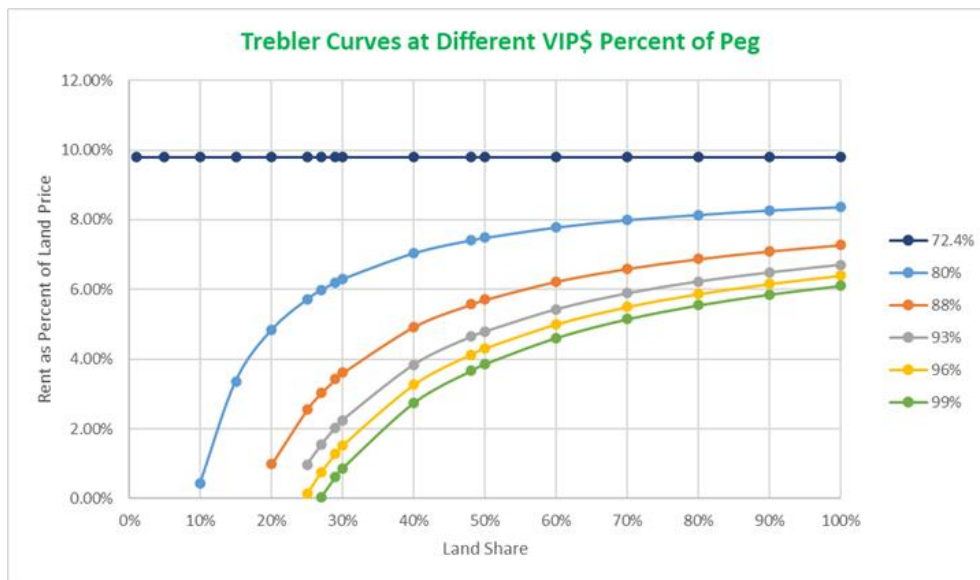
With the Elsie discounted by more than 1%, the trebler is willing to [treble](#) for a higher amount, all things being equal. By how much and how much do results vary by land share?

Discounts are applied to several parameters used to determine a treble-safe rent.

1. Discounts on the [structure value and premium](#) are the most crucial benefit to treblers in low-land-share areas. Discounted Elsies reduce the structure premium and, if low enough, change it into a discount. Whatever the current ground rent, it is only a fixed purchase cost.
2. The one-year [advance rent](#) – paid in Elsies, is now settled in discounted Elsies.
3. The variable loan fees charged by the bank on the structure. This is an automatic benefit since the loan amount is discounted if borrowed U.S. dollars are used to purchase Elsies at closing.
4. The monthly ground rent is voluntarily paid in discounted Elsies for the duration of the discount. This is a proxy for a spike in rent paid to account for the discount.

What happens to the treble curve when these discounts are applied?

Rents For Various Land Shares with VIP\$ at Different Percent of Peg							
Land Share	99% peg	96% peg	93% peg	88% peg	80% peg	72.4% peg	
1%						9.80%	
5%						9.80%	
10%					0.42%	9.80%	
15%					3.36%	9.80%	
20%				0.99%	4.83%	9.80%	
25%			0.13%	0.97%	2.56%	5.71%	9.80%
27%		0.03%	0.75%	1.54%	3.03%	5.98%	9.80%
29%		0.61%	1.28%	2.03%	3.43%	6.20%	9.80%
30%		0.86%	1.52%	2.25%	3.61%	6.30%	9.80%
40%		2.74%	3.26%	3.84%	4.93%	7.04%	9.80%
48%		3.66%	4.13%	4.64%	5.57%	7.41%	9.80%
50%		3.86%	4.31%	4.79%	5.71%	7.48%	9.80%
60%		4.61%	5.00%	5.43%	6.23%	7.78%	9.80%
70%		5.15%	5.50%	5.89%	6.60%	7.99%	9.80%
80%		5.55%	5.87%	6.23%	6.88%	8.14%	9.80%
90%		5.86%	6.16%	6.49%	7.10%	8.27%	9.80%
100%		6.11%	6.40%	6.71%	7.28%	8.36%	9.80%



The effect of a discount is to shift the treble curve up and to the left and to increase its convexity, reaching a perfect horizontal line at 72.4% of the peg. All parameters are default, except property tax, which is 0.5%.

Notice the steep slopes at low land share and the flatter slopes at higher ones. With a median residence land share of 33% in the U.S., a small discount in the Elsie will have a highly leveraged effect on ground rent. A \$500,000 property with a 40% land share will see its annual ground rent rise from \$5,600 to about \$10,000 if the Elsie falls from 99% to 88% of the peg.

Since most property owners will neither be aware of the discount nor unilaterally raise their rent, the outcome will be an immediate increase in trebling. The impact of an Elsie discount will be concentrated on low-land share properties but felt everywhere.

To see this clearly, we convert these curves to average rent lines by multiplying each entry by 2 x land share:

Average Rent as a Percent of Purchase Price For Various Land Shares with VIP\$ at Different Percent of Peg

Land Share	99% peg	96% peg	93% peg	88% peg	80% peg	72.4% peg
1%						0.20%
5%						0.98%
10%					0.08%	1.96%
15%					1.01%	2.94%
20%				0.40%	1.93%	3.92%
25%		0.07%	0.49%	1.28%	2.86%	4.90%
27%	0.02%	0.41%	0.83%	1.64%	3.23%	5.29%
29%	0.35%	0.74%	1.18%	1.99%	3.60%	5.68%
30%	0.52%	0.91%	1.35%	2.17%	3.78%	5.88%
40%	2.19%	2.61%	3.07%	3.94%	5.63%	7.84%
48%	3.51%	3.96%	4.45%	5.35%	7.11%	9.41%
50%	3.86%	4.31%	4.79%	5.71%	7.48%	9.80%
60%	5.53%	6.00%	6.52%	7.48%	9.34%	11.76%
70%	7.21%	7.70%	8.25%	9.24%	11.19%	13.72%
80%	8.88%	9.39%	9.97%	11.01%	13.02%	15.68%
90%	10.55%	11.09%	11.68%	12.78%	14.89%	17.64%
100%	12.22%	12.80%	13.42%	14.56%	16.72%	19.60%



While the 100% peg line is not shown, it would be a hair below the 99% line. It might appear that if the Elsie traded at a premium, people would pay less rent. However, rent can be paid in either Elsies or U.S. dollars. If the Elsie traded at a premium, people would pay rent in U.S. dollars, so there would be no difference in

rent paid whether there was a 0% Elsie premium (= 0% Elsie discount = 100% line) or a high premium.

The upward shift in the average rent as a percentage of the purchase price line, at increasing discounts of the Elsie to the peg, is used to get a rough measure of treble arbitrage opportunities that put a floor on the Elsie discount. A simple treble arbitrage example follows.

Consider a \$1 million McMansion sold into the commons trust with a 27% land share. The rent is a very low .02% (\$200/year) at 99% of the peg if the property owner even bothers paying rent.

What would happen if the Elsie dropped to 93% peg? The McMansion rent should rise to 0.83% (\$8,300/year), a 4,050% increase. The rent is unlikely to be raised, and treblers will feast on cheap properties like this.

Expensive homes on cheaper land are susceptible to any discount in the Elsie. As the Elsie drops deeper below the peg, they are the first to fall into the zone where it is cheaper to treble than to purchase an identical house on private land.

However, trebling these McMansions requires many Elsies to take full advantage of the discount. These houses are rent-free under normal circumstances and property-tax-free under all circumstances.

For those who have the liquidity to match the trebler, rents will be allowed to fall freely until trebled. On average, when rents fall to the [treble danger point](#), they will be trebled and then, in one year, fall back to the treble danger point, where they will be trebled again.

This leads to a uniform distribution of rents between the treble danger and treble points, with the average rent halfway between. Those without liquidity will likely cluster closer to the bottom of the range.

Assuming a uniform distribution of rents at any land share between the treble danger and treble point, the Elsie discount can be used to determine likely trebles.

However, this number is conservative because people may [freeze their rents](#) just above the treble danger line because they lack the liquidity to match the trebler.

First, consider properties that must pay a ground rent. If the discount at least triples the treble danger rent, then 100% of the properties at their current rent are now in the treble danger zone (regardless of distribution).

If the discount doubles the treble danger rent, 50% of the properties will be in the danger zone (likely many more due to a realistic clustered distribution). Graphing these points as a line gives a slope of 0.5 and a Y-intercept of -0.5. The formula is:

Percent of properties trebled = MIN (100%, (treble danger rent at Elsie discount/treble danger rent with no Elsie discount) * 0.5 - 0.5).

For properties with a land share too low for rent, trebling will be done because the discount is a discount on the structure and premium. Once the discount is large enough that the cost of the structure is below market value, 100% of properties will be trebled.

However, because there is no property tax, trebles will increase with the size of the discount, even if an effective premium is present. The amount paid for the structure is 133% of the depreciated replacement value multiplied by the discount.

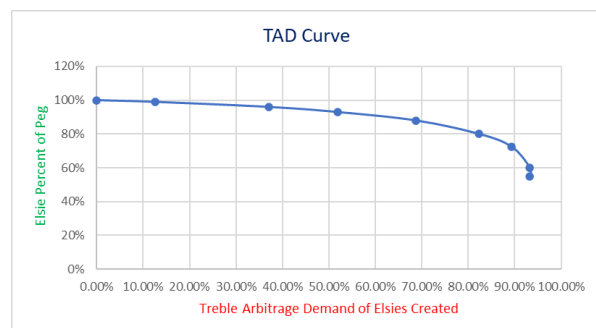
If this exceeds 33%, 100% of properties will be trebled. Otherwise, it is a function of the property taxes. Because a 0.5% property tax is 1/10 of a 5% rent, people will pay a 10% premium.

However, based on a 5% interest rate, those with a 1% property tax will pay a 20% premium, and those with a 1.5% property tax will pay a 30% premium. Property taxes will vary because the properties in question are low-land share (waiting-list properties).

The method used is to compare the premium to 33% and subtract that from 100% to arrive at the percentage of properties trebled. The formula is $\text{MIN}(100\%, 1 - (33\% - (1.33 \times \text{discount}))/33\%)$.

Using the [land share histogram](#) from AEI, it is possible to calculate the percentage of treble arbitrage Elsie demand for any discount.

Treble Arbitrage Demand Data																		
Rent Free:	Percent trebled = 1 - ((33% - (1.33% * discount)) / 33%)																	
Rent:	Percent trebled = (rent at discount/rent at no discount) * 0.5 - 0.5																	
	1.00%	5.00%	10.00%	15.00%	20.00%	25.00%	27.00%	29.00%	30.00%	40.00%	48.00%	50.00%	60.00%	70.00%	80.00%	90.00%	100.00%	SUM
Land-Share Histogram	0.10%	0.30%	3.00%	4.95%	12.84%	5.00%	6.00%	1.90%	25.84%	16.88%	3.09%	9.94%	7.95%	1.99%	0.20%	0.02%		100.00%
VIPs needed + 6% advance rent	137.67%	132.35%	125.70%	119.05%	112.40%	105.75%	103.09%	100.43%	99.10%	85.80%	75.16%	72.50%	59.20%	45.90%	32.60%	19.30%		
Percent trebled at 99%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	100%	28.21%	15.15%	3.31%	1.84%	1.88%	1.34%	1.19%	1.01%	0.87%	0.75%	
Weighted VIPs	0.01%	0.02%	0.15%	0.24%	0.58%	0.21%	6.19%	0.54%	3.88%	0.48%	0.04%	0.14%	0.06%	0.01%	0.00%	0.00%	0.00%	12.54%
Percent trebled at 96%	16.12%	16.12%	16.12%	16.12%	16.12%	100%	100%	100.00%	65.15%	13.42%	8.50%	7.93%	5.68%	4.67%	3.95%	3.47%	3.16%	
Weighted VIPs	0.02%	0.06%	0.61%	0.95%	2.33%	5.29%	6.19%	1.91%	16.68%	1.94%	0.20%	0.57%	0.27%	0.04%	0.00%	0.00%	0.00%	37.06%
Percent trebled at 93%	28.21%	28.21%	28.21%	28.21%	28.21%	100%	100%	100.00%	100.00%	24.71%	15.72%	14.38%	10.47%	8.55%	7.26%	6%	5.73%	
Weighted VIPs	0.03%	0.08%	0.85%	1.40%	3.62%	5.00%	6.00%	1.90%	25.84%	4.17%	0.49%	1.43%	0.83%	0.17%	0.01%	0.00%	0.00%	51.82%
Percent trebled at 88%	48.36%	48.36%	48.36%	48.36%	100%	100%	100%	100.00%	100.00%	45.91%	28.90%	26.75%	19.38%	15.61%	13.24%	11.63%	10.47%	
Weighted VIPs	0.07%	0.19%	1.82%	2.85%	14.43%	5.29%	6.19%	1.91%	25.61%	6.65%	0.67%	1.93%	0.91%	0.14%	0.01%	0.00%	0.00%	68.67%
Percent trebled at 80%	80.61%	80.61%	80.61%	100%	100%	100%	100%	100.00%	100.00%	86.96%	54.96%	50.54%	36.64%	29.42%	24.82%	21.79%	19.44%	
Weighted VIPs	0.11%	0.32%	3.04%	5.89%	14.43%	5.29%	6.19%	1.91%	25.61%	12.60%	1.28%	3.64%	1.72%	0.27%	0.02%	0.00%	0.00%	82.31%
Percent trebled at 72%	100%	100%	100%	100%	100%	100%	100%	100.00%	100.00%	100.00%	88.81%	81.72%	59.13%	47.42%	40.07%	0.350694	0.313953	
Weighted VIPs	0.14%	0.40%	3.77%	5.89%	14.43%	5.29%	6.19%	1.91%	25.61%	14.48%	2.06%	5.89%	2.78%	0.43%	0.03%	0.00%	0.00%	89.30%
Percent trebled at 60%	100%	100%	100%	100%	100%	100%	100%	100.00%	100.00%	100%	100%	100%	100%	88%	74%	64%	54%	
Weighted VIPs	0.14%	0.40%	3.77%	5.89%	14.43%	5.29%	6.19%	1.91%	25.61%	14.48%	2.32%	7.21%	4.71%	0.81%	0.05%	0.00%	0.00%	93.19%
Percent trebled at 55%	100%	100%	100%	100%	100%	100%	100%	100.00%	100.00%	100%	100%	100%	100%	100%	100%	95%	70%	
Weighted VIPs	0.10%	0.40%	3.77%	5.89%	14.43%	5.29%	6.19%	1.91%	25.61%	14.48%	2.32%	7.21%	4.71%	0.91%	0.07%	0.00%	0.00%	93.28%



We can draw the Treble Arbitrage Demand (TAD) curve from this.

The actual TAD curve is a hyperbola. However, the hyperbolic shape, with a treble arbitrage demand asymptote at 93.3% and an Elsie percentage of peg asymptote of 100%, reveals the

increasing benefits of reducing Elsie supply.

If the supply of Elsie's on the market exceeds 93.3% of the total Elsie's ever created, TAD offers no floor for the Elsie. Based on TAD alone, the Elsie could fall to zero, even if all properties were trebled.

However, four processes are contributing to a reduction in the Elsie supply, all of them significant.

1. Elsie's destroyed during ram and jam
2. Elsie's destroyed in direct mode purchases
3. Elsie's sequestered in the advance rent fund
4. Elsie's sequestered in the Earth Dividend Subsidy Fund (EDSF)

Most importantly, an attempted treble permanently lowers the supply of Elsie's by 25% to 50% of twice the current rent. Temporarily, it reduces the supply of Elsie's by 100% of the amount in treble escrow. Why is this?

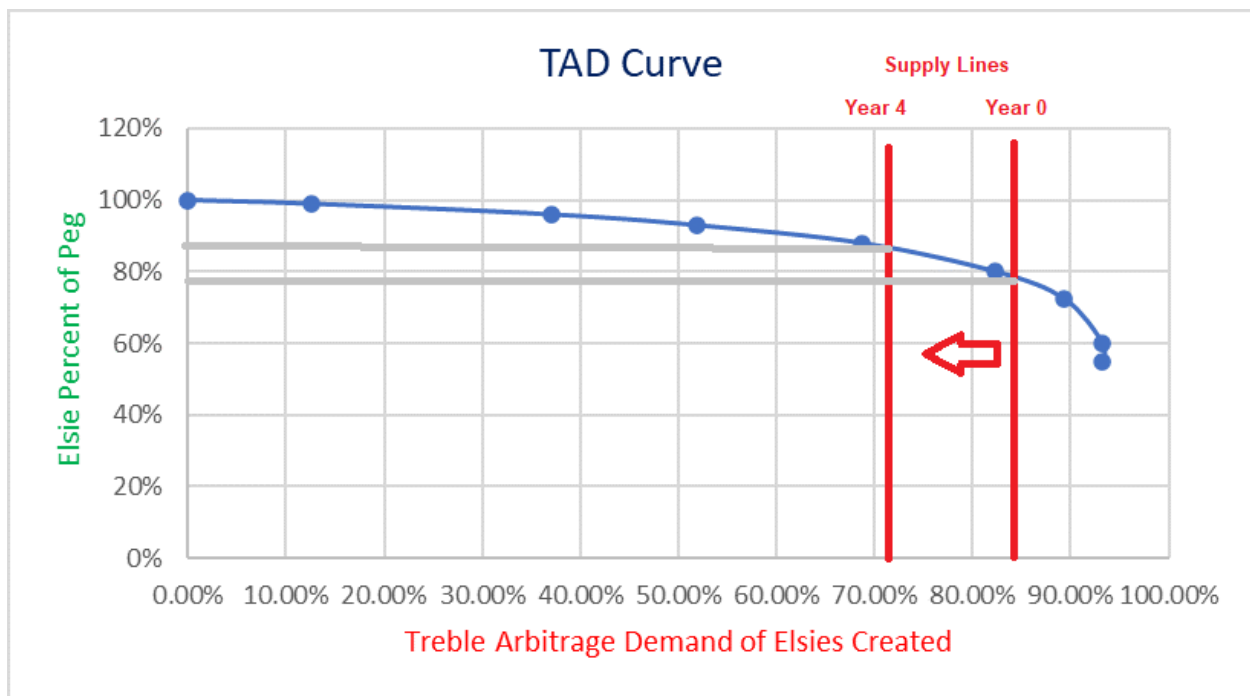
A treble is initiated with 133% structure value + three times current rent, or on average 93.3% (based on AEI histogram data) of the Elsie's created for that property. This amount is in treble escrow and temporarily reduces the supply of Elsie's on the market by the Elsie's in treble escrow. Whether the treble succeeds or

fails, a net two times the current rent is added to the advance rent fund, either from the treble escrow or a property owner match. If the treble succeeds, the Elsies go to the former property owner as a new source of Elsie supply. If the treble fails, treble escrow is returned to the trebler, who will likely use these discounted Elsies for another try.

We can use the simulation spreadsheet to compute the Elsie supply line on the TAD curve.

Based on these parameters, conservatively, 12% of Elsies are destroyed after four years, with 4% eliminated at the start. Another 13% of Elsies are sequestered in the EDSF, with 9% sequestered at the beginning, and 2.5% of property value in Elsies is in the advance rent fund. After four years, given 5% growth, 3% of Elsies created are in the advance rent fund.

The supply line begins at 100% - 15.5% = 84.5% and ends at 100% - 28% = 72% four years later.



The natural limits of the Elsie supply prevent a discount of less than 78% of the peg at the start and less than 86% of the peg four years later.

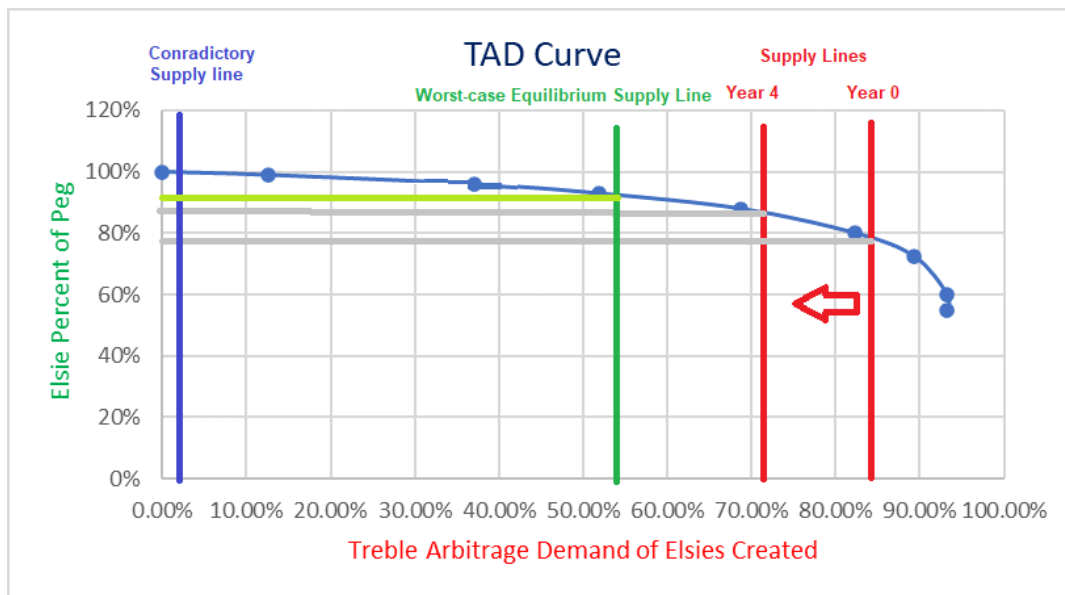
However, these supply lines fail to account for Elsies used in treble arbitrage, whether a temporary supply shortage or a permanent one.

The last column of the Treble Arbitrage Demand table above shows the percentage of Elsies created that are sequestered based on the discount to peg. For instance, at 88% of the peg, 68.67% of all Elsies created are tied up in treble escrow. At 80% of the peg, 82.31% of all Elsies are tied up in treble escrow.

This creates a problem that must be solved dynamically. Extrapolating, we subtract 80% from our 84.5% (year 0) supply line to account for Elsies temporarily used in treble arbitrage. This gives us a net supply line of 4.5%. Or we can subtract 70% from the 72% supply line (year 4) for a net supply line at 2%.

However, these supply lines correspond to discounts of less than 1%. In other words, they do not affect the 99% floor. But there is far less treble arbitrage at these discounts, so the line that got us to this point is no longer valid and must be moved back. But if moved back, it becomes valid and must be moved forward again.

The line is just an abstraction. It settles at an equilibrium. The easiest way to find the equilibrium is with a simulation. A simulation tells us that the discount cannot fall below 92% of the peg under any natural circumstances because of the counter-effects of treble arbitrage demand alone.



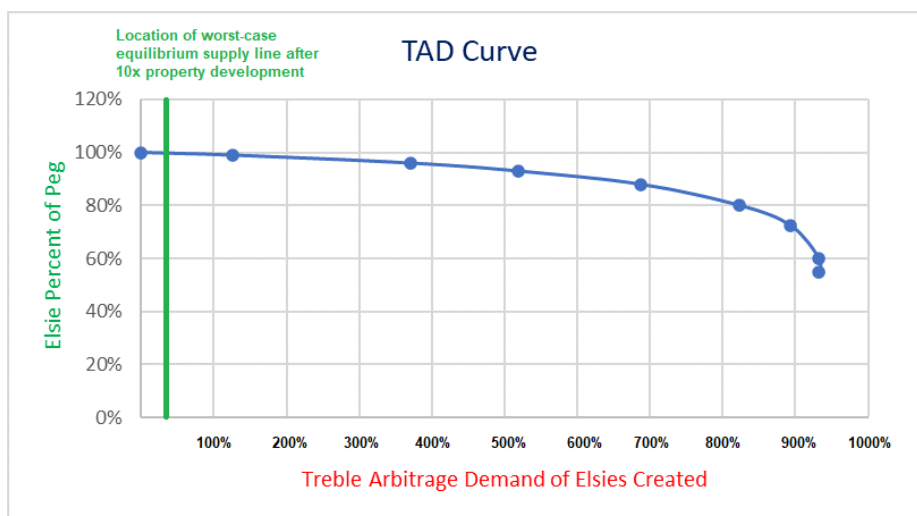
The TAD curve's importance in monetary policy is not so much its role in providing a floor for Elsie as its measurement of the effect of new construction on Elsie demand when the discount is held steady at 1% (99% of the peg).

New construction is rewarded with a 33% premium that lowers one's rent, so there is an excellent incentive for development. What is the relationship between new construction and the TAD curve? Because property tax is abolished on commons trust land, it will be standard for developers to treble a run-down property or vacant land and build larger, more efficient structures. The replacement cost of these structures far exceeds the Elsies created when the original property was moved into the commons trust.

New construction not only increases treble arbitrage demand for the Elsie, but as discussed in the [Is Land Value a Fluid](#) module, it also increases total rents worldwide.

Increased rents increase the dividend on the Elsie, increasing the demand for it as a financial instrument. They reduce the supply of Elsies by sequestering more of them in an advance rent account. Additionally, more Elsies are demanded for a treble.

The effect of new construction is to change the multiplier on the horizontal axis. Suppose the average value of new construction is 10x the original Elsies minted for vacant land and dilapidated structures. In that case, the effect is to multiply the percentages of Elsies demanded on the treble arbitrage demand line by 10.



As fiat inflation and new construction contract the horizontal axis of the TAD curve, treble arbitrage leaves the 99% floor unbreakable.