Columns of the Phase I Spreadsheet

The Phase I spreadsheet has over 50 columns and enough rows to accommodate 317 years, although under the influence of the strictly natural process of natural demand, with unexpectedly low growth, the Phase I metrics (80 million $250,000 average parcels in 2022 dollars = $20 trillion of property in 2022 dollars) are achieved in 293 years, ten months. With catalysts implemented by a qualified CEO, the time can be reduced to as little as 20 years. The period is one month long, which differs from the implementation's daily periods. Daily ram and jam decreases overall duration, while smaller market maker inventories increase duration, somewhat compensated by higher dividends in the all-natural process. Evidence indicates that the net effect is neutral. Each period (month) is divided into five segments, A - E. Five segments are sufficient to handle the money flow during the period without ambiguity.

Period	Segment	MM Demand (Mil $)	Percent Peg	Dividend Percent	Retail Supply Shock(+) Demand Shock(-)	MM Supply Shock(+) Demand Shock(-)	Rescue Mode	Ongoing Retail Trade	Ram and Jam Contracts Signed	Land Fund (Mil $)	Land Fund Loan	Property Value (Mil $)	Total Purchases (number of properties)	Average Property Price
	E	$6.00	99.00%	3.50%						$1.00				$0.25
1	A	$6.00	99.00%	3.50%					$6.00	$0.69		$6	24	$0.25
1	B	$0.25	99.00%	3.50%						$0.69		$6	24	$0.25
1	C	$0.25	99.00%	3.50%						$0.69		$6	24	$0.25
1	D	$0.25	99.00%	3.50%						$0.69		$6	24	$0.25
1	E	$0.25	99.00%	3.50%						$0.69		$6	24	$0.25
2	A	$0.25	99.00%	3.50%						$0.69		$6	24	$0.25
2	B	$0.59	99.00%	3.50%						$0.69		$6	24	$0.25
2	C	$2.22	99.00%	3.50%						$0.69		$6	24	$0.25
2	D	$2.22	99.00%	3.50%						$0.69		$6	24	$0.25
2	E	$2.22	99.00%	3.50%						$0.69		$6	24	$0.25
3525	A	$27,153,635.52	99.00%	3.50%					$27,153,635.52	$25,795,450.04		$12,700,368,192	79,930,227	$88.57
3525	B	$3,904,683.39	99.00%	3.50%						$25,795,450.04		$12,700,368,192	79,930,227	$88.57
3525	C	$37,189,328.63	99.00%	3.50%						$25,795,450.04		$12,700,368,192	79,930,227	$88.57
3525	D	$37,210,371.80	99.00%	3.50%						$25,795,450.04		$12,700,368,192	79,930,227	$88.57
3525	E	$26,752,716.69	99.00%	3.50%						$25,795,450.04		$12,700,368,192	79,930,227	$88.57
3526	A	$26,752,716.69	99.00%	3.50%					$26,752,716.69	$25,541,211.35		$12,769,455,469	80,231,770	$88.72
3526	B	$3,956,037.15	99.00%	3.50%						$25,541,211.35		$12,769,455,469	80,231,770	$88.72
3526	C	$37,210,371.80	99.00%	3.50%						$25,541,211.35		$12,769,455,469	80,231,770	$88.72
3526	D	$37,594,088.89	99.00%	3.50%						$25,541,211.35		$12,769,455,469	80,231,770	$88.72
3526	E	$27,442,994.77	99.00%	3.50%						$25,541,211.35		$12,769,455,469	80,231,770	$88.72

The figure shows the first 15 columns of the spreadsheet for the two months at the start of Phase I and the two months at the end of Phase I when simulated under only natural demand and prolonged growth. This spreadsheet simulates natural demand from an initial investment of $1 million in the land fund and $6 million of market maker capitalization. These are part of a total $24 million investment. Natural demand excludes a retail segment and investment outside of small cash infusions when the annualized dividend rises above 6% to return the yield to 6%. Due to deflationary mechanisms inherent in the model, the annualized dividend would rise to infinity without such a mechanism.

The first column, Period, is the month number. The spreadsheet begins with the last segment of period 0 to initialize the column. Formulas for the column begin in segment A of period 1. In subsequent displays, columns that are not germane to the discussion are hidden.

Market maker demand (column 3), initialized to $6 million, is entered by hand and can be changed for different simulations. All U.S. dollar and Elsie columns are in millions. In this simulation, where the initial average property price is $0.25 in column 15 of month 1, the $0.25 represents $250,000. As you can see, the average property price increased to $88.7 million after 293 years of 2% inflation. “The Number of

Properties Purchased" in column 14 is inflation-independent and reliable for determining the end of Phase I, regardless of duration.

Advanced rent mode, which only levied 5% of the purchase price for the advance rent fund, is no longer seen as a viable option in Phase I. Instead, any property, regardless of land share, qualifies for the new direct purchase mode, where 55% of the purchase price is levied. 5% goes to the advance rent fund, and 50% is disbursed with an "immediate-delayed" disposition. Because this is equivalent to an auction following a sale, auction mode (formerly sales mode) is assumed throughout the simulation.

Columns will be described logically, not in the order in which they appear in the spreadsheet. The formula for the column will be boxed, highlighted, and described in detail, including background theory, if needed.

The spreadsheet is double-zero-balanced. The U.S. dollars input into the system are precisely equal to the U.S. dollars in the various paid and current accounts. The Elsies created from purchases are identical to the Elsies in the paid and current accounts, plus the Elsies destroyed. These balanced columns appear in green near the final columns of the spreadsheet. Here is an example from month 800 of the natural demand simulation, with most columns hidden. The green columns are farther apart than shown.

Period	Segment	MM Demand (Mil $)	Ram and Jam Contracts Signed	Land Fund (Mil $)	Advance rent funds (Mil dollars)	Advance Rent Funds (Mil LC$)	Dividend Payable	EDSF	Total Accounts	Elsies Created	Elsies Destroyed	Total Elsies	Total Dollars Input (Mil $)	ABC (Mil $)	Total Account Dollars (Mil $)
800	A	$151.16	$151.16	$124.33	$38.84	1,714.9645	0.00	10,224.60	30,845	40,570.20	9,725.42	30,845	$78,819.22	$2,703.23	$78,819.22
800	B	$20.36	$0.00	$124.33	$42.60	1,572.0508	0.00	10,224.60	30,845	40,570.20	9,725.42	30,845	$79,045.29	$2,703.23	$79,045.29
800	C	$212.87	$0.00	$124.33	$39.05	1,724.2287	0.00	10,224.60	30,845	40,570.20	9,725.42	30,845	$79,045.29	$2,703.23	$79,045.29
800	D	$212.87	$0.00	$124.33	$39.05	1,724.2287	0.00	10,224.60	30,845	40,570.20	9,725.42	30,845	$79,045.29	$2,703.23	$79,045.29
800	E	$151.98	$0.00	$124.33	$39.05	1,724.2287	7.65	10,281.95	30,845	40,570.20	9,725.42	30,845	$79,045.29	$2,718.39	$79,045.29
801	A	$151.98	$151.98	$121.95	$39.05	1,724.2287	0.00	10,281.95	30,938	40,722.18	9,783.73	30,938	$79,068.33	$2,718.39	$79,068.33

Notice that there are purple-headed and red-headed columns on the spreadsheet. Purple-headed columns are dollar account columns (their sum adds to the Total Account Dollars, the final column shown above). Red-headed columns are Elsie-account columns. Their sum is added to the Total Accounts column (the first green column above). Most purple-headed and red-headed columns are not shown in the table above.

Modifiable Parameters

			General Inflation rate		2%	Commons land Appreciation		4.0%
Owners allowing rent to fall times percent of treblers using Elsies					50%			
			Retail Demand/Savers					

These four parameters at the top of the spreadsheet significantly affect the outcome. Values shown are for natural demand with prolonged growth. In this case, the general inflation rate is set at 2%, and land or property appreciates at 4% or 2% over inflation. Due to the lack of property taxes, growth is expected to be 5%. A value of 6% represents the formation of megacities on Commons Trust land, and 8% represents super-megacities. It is unrealistic for growth rates on average to exceed 8%. Not all Commons Trust property will become megacities. Conservative simulations should be run at 5%.

Owners allowing rent to fall times the percentage of treblers using Elsies is conveniently set at 50%. If the goal is to pay the lowest rent, the most efficient rental strategy is to allow one's rent to fall until trebled and then match the trebler (or surrender the property). However, for those at the very top, high rents bring aristocracy and bragging rights (in land-based capitalism, rents are the new Rolex). For those who live paycheck to paycheck, lack of liquidity prevents matching the trebler. Some would rather pay monthly rent and avoid the hassle of being trebled every year. Everyone will not use the efficient rental strategy.

While treblers tend to be more sophisticated than property bidders at auction and more invested in the AFFEERCE business plan, there is no assurance that all of them will use Elsies to take advantage of the 0.85% arbitrage discount.

If everybody used the efficient rental strategy, and all trebles used Elsies, the value of this parameter should be set to 100%. If 75% of the property owners used the efficient rental strategy and 66.67% of treblers used Elsies, it should be set to (75% of 66.67% =) 50%. This is the value used by default in runs of the simulation testing the effect of other parameters. During deep discounting (a fall below 99% of peg), a value of 100% is automatically used.

The parameter "Retail demand/savers" is set at 0% of property value for natural demand. This parameter produces inaccurately slow results when set over 63%. At that level, Phase I will end as soon as logistically possible, but the simulation, with its discrete monthly periods, still shows a 20-year Phase I. A marker of higher-than-possible retail demand is a negative market maker inventory in segment A. While the market maker's stock often goes negative in segment B, if it cannot recover by segment A of the next period, there is demand for more Elsies than are minted for a property, or that must be sequestered. In that case, logistics is the only constraint on the duration of Phase I. The logistical limit is a function of the property in the Commons Trust. At the very start of Phase I, "Retail demand/savers" can be as high as 90% for a few months before logistics becomes the only constraint. Logistics will be the only constraint after 150 years of natural demand if the parameter rises to 45% on a continuation worksheet. The more prolonged Phase I has muddled along with natural demand, the easier it is to start an Elsie buyer's panic.

When estimating the value for "Retail demand/savers," consider the number of people holding Elsies for retirement, the number of people keeping Elsies for the dividend, and the extent to which Elsie is used in commerce. This also includes other market makers not accounted for in the simulation. Legacy governments would be wise to purchase Elsies to protect their citizens from Phase II hyperdeflation.

The largest holders of Elsies are renters protecting themselves from a treble, professional auction bidders, with possibly the largest of all being professional treblers. Bidding at auction and trebling are free services. Matched Treblers usually have their money freed in 3-6 days. The funds are sequestered until possession changes in the event of treble success. Auction bids are sequestered for less than 24 hours (including the duration of segment C, where Elsies are qualified for the dividend). The only cost of an auction bid or treble is the lost dividends (usually not too high).

Professional bidders might enter a low bid at multiple auctions, hoping for a win. With the winning bid expected to be near 50% of property value, the Elsies held by a professional bidder might be three times the average property value for six concurrent actions. Treblers need about 150% of the property value (133% of the structure plus treble rent). Professional treblers would hold three times the average property value for two concurrent trebles. If 0.1% of the world's population were professional bidders or treblers, they would demand enough Elsies (8 million x 3 x $250,000 = 6 trillion) to terminate Phase I as quickly as logistically possible and bring about the hyperdeflation of Phase II in under a year. A parameter setting of 63% would be conservative until the final days of Phase I.

There is every reason to believe those who do not possess Elsies in Phase II will suffer financial ruin. Even if this is an exaggeration, no portfolio should be without Elsies as the world enters Phase II. Proper communication of this message will significantly increase the holding of Elsies and bring Phase II much closer simultaneously, creating a "virtuous" cycle and even triggering panic buying of Elsies.

Because communication of these ideas is the crux of the value for this parameter, consider using numbers from 0% to 63% as a measure of CEO skill.

Average Property Price

=O15 * IF ($B16="A", (1+General_Inflation_Rate/12), 1)

Period	Segment	Total Purchases (number of properties)	Average Property Price	Market Maker (Mil LC$)
0	E		$0.25	0.00
1	A	48	$0.25	11.75
1	B	48	$0.25	11.75
1	C	48	$0.25	11.75
1	D	48	$0.25	11.75

All columns except those on either side of Average Property Price + period and segment are hidden. Notice that the average property price is initialized to $250,000. Because the simulation takes place over many years, the average price the ABC pays for property will increase with inflation. This price has only a minor effect on the outcome of the simulation. Primarily, it is used to determine how much of the land fund must be destroyed (1 property's worth) for a ram and jam session.

The value from the previous month (O15) is multiplied by the monthly rate of inflation (General_Inflation_Rate/12).

Land Fund (U.S. Dollars)

=K15 – IF (AND ($B16="A", J16 > 0), O16 + (J16 - O16) * (1-MM_Bottom), 0) + IF (AND ($B16="E", C15 > Loan_Criterion, K15 < 2 * O15), 1, 0) + IF (AND ($B16="A", L15 < 0, K15 > 1),-1, 0) + IF ($B16="A", IF (AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/MM_Bottom)), AC15 * MM_Bottom)) - IF (AND (B16="A", F16 < 0), (O16 - O16 * MM_Bottom + ((-F16 - O16) * (1 - MM_Bottom))))

Period	Segment	Land Fund (Mil $)	Land Fund Loan
0	E	$1.00	
1	A	$0.64	0
1	B	$0.64	0
1	C	$0.64	0
1	D	$0.64	0
1	E	$0.64	0

In the implementation, the land fund is distributed from the rents and auction proceeds in whatever currency is left over after currency requirements for other recipients have been met. The land fund will typically be distributed in Elsies from rents and dollars from auction proceeds. In the simulation, the land fund always receives Elsies from both rents and auction proceeds (auction proceeds are converted to Elsies through the market maker). Although this is more expensive than pure ram and jam, it comes closest to simulating the implementation in a declarative spreadsheet.

The U.S. dollar land fund pays the full price for the first property in ram and jam and 0.0095% of the full price for each property after that, assuming a single average property price during a theoretical single run of ram and jam. Property prices will vary in implementation, and multiple runs of ram and jam will merge and diverge. Still, in this simulation, a single run captures all Elsie demand, provided the land fund is sufficient to support the entire run. Otherwise, it runs to the extent of the land fund.

Subtracted from the current land fund (**K15**) in segment A is the land fund cost of running ram and jam (**O16 + (J16 - O16) * (1-MM_Bottom)**). The average property price (**O16**) plus additional contracted

properties in the run (**J16 - O16**) multiplied by the land fund cost of subsequent properties in a ram and jam, .0095% of the purchase price (**1-MM_Bottom**). In an implementation, ram and jam captures unseen demand below 99.05% of the peg down to 99.01% of the peg, which is not included in the simulation.

The subsequent two operations handle the case where demand for Elsies is strong enough to trigger a large run of ram and jam, but the land fund is insufficient to handle the demand. The second operation happens in segment E. A meager land fund can support a large ram and jam. While a land fund equal to the price of an average property can only purchase one property, a land fund twice that size can buy 51 properties. On closing, these 51 properties will generate far more money for the land fund than needed to trigger the action.

This operation checks if borrowing into the land fund is profitable, to be repaid at property closing (**C15 > Loan_Criterion, K15 < 2 * O15**). If the demand for Elsies (**C15**) is greater than a set parameter (**Loan_Criterion**) (set in the simulations to $2 million) and the land fund is less than twice the average property price (**K15 < 2 * O15**), then borrow $1 million into the land fund to be repaid in 30 days. The market maker will usually make the loan interest-free. The situation arises when they are desperate to replenish their Elsie inventory and are flush with U.S. dollars from renters who have cleared the stock, but the ABC does not have the land fund needed to handle the demand through ram and jam. Good management prevents this situation from happening more than once or twice early in Phase I.

The next operation happens in segment A. If the land fund loan column (**L15**) shows that money is owed, and if the land fund has more than a million dollars (**K15 > 1**), repay the million dollars.

The next operation also happens in segment A. If there is less than $10 million in the land fund, or the land fund has less than .0095% of the current demand, (**AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/MM_Bottom))**) convert Elsies in the Elsie land fund (**AC15**) to land account dollars through ram and jam (**AC15 * MM_Bottom**).

The final operation also happens in segment A, and it is like the first operation, except that instead of buying property with dollar demand, it is buying property with Elsie demand. These are demand shocks (**F16**) in Elsies (indicated by a negative sign and in segment A only), where the purchaser buys Elsies from the ABC during ram and jam rather than the market maker. The first hit on the land fund is (**O16**), as in the dollar case. As in the dollar case, the run extracts (1 - MM_Bottom) from the land fund for the remaining properties (-F16 - O16). The difference comes with the money left over at the end (**O16 * MM_Bottom**), which must be added back to the land fund.

Land Fund Loan Account

=L15 + IF (AND ($B16="E", C15 > Loan_Criterion, K15 < 2*O15), -1, 0) + IF (AND ($B16="A", L15 < 0, K15 > 1), 1, 0)

The loan account inherits its previous value in column L and has two operations.

These two operations must have identical conditions to the corresponding operations in the land fund. The decision of when to make a loan and when to repay the loan must be the same in both columns, or the spreadsheet will not balance.

The first operation makes the loan, so it is -1 in the loan account and +1 in the land fund. Repayment of the loan is +1 in the loan account and -1 in the land fund.

This interest-free loan is an artifact of the simulation and will not likely occur in a ram and jam implementation.

Period	Segment	MM Demand (Mil $)	Ram and Jam Contracts Signed	Land Fund (Mil $)	Land Fund Loan
137	D	$2.03	$0.00	$0.20	0
137	E	$1.99	$0.00	$1.20	1
138	A	$1.99	$1.99	$0.11	0
138	B	$0.30	$0.00	$0.11	0
138	C	$0.38	$0.00	$0.11	0
138	D	$0.38	$0.00	$0.11	0
138	E	$0.35	$0.00	$0.11	0
139	A	$0.35	$0.00	$0.09	0
139	B	$0.45	$0.00	$0.09	0
139	C	$1.08	$0.00	$0.09	0
139	D	$1.08	$0.00	$0.09	0
139	E	$1.04	$0.00	$0.09	0
140	A	$1.04	$0.00	$0.18	0
140	B	$0.74	$0.00	$0.18	0

With $1.99 million in demand and a land fund of $200,000, less than the price of an average property, a loan is made in 137-E of $1 million to the land fund, bringing the total up to $1.20 million. This triggers a ram and jam run for about eight properties (because actual properties vary in price, and to maintain spreadsheet balance, fractional properties can be purchased), which eats the entire land fund and an extra $110,000. The meaning of a negative (red) land fund is either that the loan was too low, or in this case, the loan was repaid in 138-A and should have been repaid in 140-A. This column is more of a check for the spreadsheet designer. Unpaid loans, or deep nesting of loans, indicate a logic error; otherwise, short runs of negative balances can be ignored.

Land Fund Elsies

```
=IF ($B16="E", Y15 * 26.25%/56%, 0)
```

The land fund receives 26.25% of the ground rent. In the simulation, the land fund receives all its revenue in Elsies. If the dollar-based land fund is sufficient, the Elsies are destroyed. If not, the Elsies are converted to the dollar land fund through ram and jam. The implementation is more efficient. Rents distributed to the land fund in dollars always go to the dollar land fund. If the dollar land fund is sufficiently large, these dollars are used directly to purchase property, even if there is no ram and jam demand. Rents distributed to the land fund in Elsies are treated the same way they are in the simulation.

The Elsie Distributor (**Y15**) obtains 56% of the ground rent and auction proceeds as Elsies. 26.25% out of that 56% go to the land fund.

Ram and Jam Contracts Signed

```
=IF (D16 < 99%, 0, IF (AND ($B16="A", C16 > O16 * 2), MAX (MIN (C16, (K15 - O16)/ (O16 * (1 - MM_Bottom))), 0), 0))
```

This column is an artifact of the simulation. Ram and jam, is the most efficient way to handle demand and any formula will be somewhat inefficient, increasing Phase I duration over implementation results.

The first test (**D16 < 99%**) checks if the percent of the peg is less than 99%. If so, no contracts can be signed. In an implementation, ram and jam is always attempted with incoming land fund Elsies. Either there is success above 99%, or they are destroyed.

Ram and jam contracts are only calculated and signed in segment A (which comprises the bulk of the period). The formula assumes a ram and jam run, where contracts are signed, Elsies minted and sold, new contracts are signed, and so on, until the limit specified in the above formula is reached.

A necessary condition is that demand is greater than the average property price (**O16**). In this case, twice the property value ensures a multiplier of at least 2. (In the implementation, the ram and jam of Elsies can terminate at any time without a property purchase.) If the condition is met, the ram and jam size is the lowest of the demand itself, and the land fund required for the ram and jam run, but at least zero.

The available land fund is found by subtracting the average price of a home from the land fund, as the full price must be paid for the first property. Each additional property costs .0095% times the average property price.

If the available land fund is negative, or there is no demand, no ram and jam is performed.

Property Value

=M15 * IF ($B16="A", (1 + Commons_Property_Appreciation/12), 1) + J16 + H16 + IF (AND (B16="A", F16 < 0), -F16/MM_Bottom)

The property value column is the previous property value(**M15**) adjusted for monthly property appreciation in segment A and totaled with new ram and jam contracts signed(**J16**) and purchases in rescue mode(**H16**).

Added to property value is the property purchased by the ABC during ram and jam to satisfy significant Elsie demand (**F16**). The dollar value of property purchased in this manner is (**-F16/MM_Bottom**).

With its Commons Trust property appreciation adjustment, property value determines the rent people will voluntarily pay and the cost of trebling property. It is used to estimate voluntary rent, retail as a percent of property value, the amount of Elsies sequestered in treble escrow, and the degree to which Elsie is backed by land.

General Inflation rate		2%	Commons Property Appreciation	4%

The general inflation rate and Commons Trust property appreciation are separate parameters. Property appreciation is generally higher by an additional 2% over inflation. In testing the megacity concept, this difference would be higher.

Total Purchases (Number of Properties)

=N15 + (J16 + H16)/O16 + IF (AND (B16="A", F16 < 0), -F16/MM_Bottom))/O16

The number of properties purchased shows the number of properties, at the average property price, that have been purchased. As the average property price rises with inflation, the number of properties purchased at the average price drops for the identical contract amounts. The previous number of properties purchased(**N15**) is added to the sum of ram and jam contracts(**J16**) and rescue mode purchases (**H16**) divided by the average property price (**O16**).

Also added to the total are properties purchased with Elsie demand that goes directly to the ABC during ram and jam (**F16**). Elsie demand has a negative sign and must be in segment A if it is a ram and jam rather than a market bid. The dollar value of properties purchased with Elsie demand is (**-F16/MM_Bottom**) and the number of properties is that value divided by (**O16**).

This number is inflation-independent and represents the same chunk of the Earth, regardless of the duration or price appreciation during Phase I. In the implementation, there are multiple criteria for ending Phase I. However, this is the metric used for comparing different tests in the simulation. The end of Phase I is defined in the simulation as 80 million, $250,000 properties (2022 dollars). Although the land is held worldwide, this is over half the total value of U.S. residential property in 2022, or $20 trillion. Should Phase I take 80 years or longer, the nominal figure would be in the quadrillions, but the actual chunk of the Earth would be the same.

Because the average price of a property is an average, fractions are maintained in total purchases and elsewhere on the spreadsheet. Discrete average property prices do not require discrete math. Any rounding would contradict a balanced spreadsheet.

Rent into the ARF

```
=IF ($B16="B", 2.49% * M11/12, 0) * 99%/D16
```

This column is near the other end of the spreadsheet. It is the average rent voluntarily paid by tenants into their advance rent fund to avoid a treble. If the average land share purchased by the ABC is 40%, then 2.49% of the purchase price will be the average rent (See 6.0 module, Average Rent as a percent of Purchase Price). As total purchase price increases with property appreciation, average rents increase by the same amount. This concept can be confusing, as rent on a particular parcel will drop as the property is developed. However, theory (and empirical data) tells us that land value increases on neighboring lots will more than compensate for the loss of land value on a developed property. If everybody builds, all rents will rise. If that were not true, nobody would pay rent to live in Manhattan.

Notice that even though this is row 16, the property value, M11, is from the previous month, or five rows back. Rent is not paid on properties under contract but on closed properties. It is assumed the closing takes place one month later. The property value column includes properties under contract. It is also reasonable, in general, that the previous month's value will determine the rent paid. (Of course, nobody knows what the rent should be, which is why the treble market exists.)

All of this is multiplied by (**99%/D16**). Column D is initialized and has a value of 99% during most simulations. However, during simulations of retail Elsie dumps, the value can drop as low as 92% of the peg. Due to a rash of trebling, rents are forced up, at least temporarily, by the discount. Even when rents subsequently return to their 99% level, funds added to the advance rent funds during the "deep discount" do not return to the property owner.

Period	Segment	Total Accounts	Total Elsies	Rent IN to ARF
0	E			
1	A	32.7496	32.7496	0.0000
1	B	32.7496	32.7496	0.0000
1	C	32.7496	32.7496	0.0000
1	D	32.7496	32.7496	0.0000
1	E	32.7496	32.7496	0.0000
2	A	32.7496	32.7496	0.0000
2	B	32.7496	32.7496	0.0687
2	C	32.7496	32.7496	0.0000
2	D	32.7496	32.7496	0.0000
2	E	31.4360	31.4360	0.0000
3	A	39.6175	39.6175	0.0000
3	B	39.6175	39.6175	0.0689
3	C	39.6175	39.6175	0.0000
3	D	39.6175	39.6175	0.0000
3	E	39.6082	39.6082	0.0000

This column, rent in, is an Elsie fund column. Notice that the heading is in red. The red header (a red-headed column) means it is one of the accounts summed in the total account's column. All Elsies must be accounted for. The sum of the accounts holding the Elsies must equal the total Elsies in existence (Elsies created from property purchases minus Elsies destroyed). Although all three columns are apart in the spreadsheet, they are shown next to each other to illustrate the concept.

Advance Rent Fund (Elsies)

=W15 + IF ($B16="C", AN15) – IF ($B16="B", W15/12)

The advance rent fund (or account) is a repository of Elsies used to pay rents according to the distribution charter of the Commons Trust. It is a collection of individual advance rent accounts, one for each property. However, the distributive property of addition allows the accounts to be combined to pay rent. That is, 1/12 of each advance rent account equals 1/12 of their sum.

There is another advance rent fund for dollars because rent can be paid in either Elsies or U.S. dollars. The distributive property works across currencies as well. The monthly rent is 1/12 of the combined advance rent accounts holding Elsies and 1/12 of those containing dollars.

Period	Segment	Advance Rent Funds (Mil LC$)	Elsie Rent	Elsie Distributor
0	E		0	0
1	A	0.0000	0.00000	0.0000
1	B	0.0000	0.00000	0.0000
1	C	0.0000	0.00000	0.0000
1	D	0.0000	0.00000	0.0000
1	E	0.0000	0.00000	0.0000
2	A	0.0000	0.00000	0.0000
2	B	0.0000	0.00000	6.0076
2	C	0.0687	0.00000	6.0076
2	D	0.0687	0.00000	6.0506
2	E	0.0687	0.00000	0.0000
3	A	0.0687	0.00000	0.0000
3	B	0.0630	0.00573	0.0000
3	C	0.1319	0.00573	0.0000
3	D	0.1319	0.00000	0.0429
3	E	0.1319	0.00000	0.0000
4	A	0.1319	0.00000	0.0000
4	B	0.1209	0.01099	1.5352

The advance rent fund is an Elsie account summed into total accounts, as seen by its red heading. It consists of the current value of the advance rent fund(**W15**) plus two operations. The operation in segment C adds the rent to the ARF described above (**AN15**). However, segment B's operation subtracts 1/12 of the advance rent fund to pay the monthly rent. Note that the rent is removed before it is added. If an individual pays rent in segment C equal to the rent removed in segment B, that individual's advance rent fund and monthly rent remain constant over time.

Elsie Rent

=IF ($B16="D", 0, X15 + IF ($B16="B", W15/12, 0))

Elsie rent is the monthly rent paid from 1/12 the Elsie advance rent fund in segment B. However, all this fund has been moved elsewhere, in segments C and D, leaving a zero balance in segment D.

In segment C, rent received in Elsies that must be converted to dollars is purchased by the market maker at 99.05% of the peg. This is a required transaction backed by the ABC.

In Segment D, what remains goes to the Elsie Distributor. However, this is handled in the Elsie rent column by zeroing out the field.

Even though the "Elsie rent" column does not maintain a balance through all segments, it is a repository of Elsies for a period. It contributes to total accounts, as indicated by its red heading. Funds sequestered here, as in the advance rent fund, are not eligible for dividends.

Elsie Distributor

=IF ($B16="E", 0, Y15 + IF (B16="D", X15, 0) + IF (B16="B", 95% * 56% * AM16/MM_Top,0) + IF (B16="D", S16/MM_Top, 0)) – IF ($B16="D", R16, 0)

The Elise Distributor distributes Elsies acquired from rent paid in Elsies, auction proceeds paid in Elsies, or rent/auction dollars converted to Elsies by the market maker to recipients of Elsies as set in the Commons Trust charter. These are the EDSF, dividend payable, and land fund. However, Elsies, not needed by the land fund, are destroyed rather than distributed.

It is a waste to convert dollars from property auctions into Elsies only to destroy or convert them back to dollars. However, the logic of the simulation would be too complex to handle alternate cases. In an implementation, land fund dollars might be used to purchase property if the land fund is overflowing and the market maker's inventory of Elsies is somewhat depleted.

In the implementation, Elsies received in the land fund are destroyed or converted to dollars through ram and jam.

All Elsies are distributed in segment E. This is handled by zeroing out the distributor in segment E.

The first operation shown happens in segment D, where the entirety of the "Elsie rent" column(X15) that was not sent to the market maker for conversion is added to the current value of the distributor(**Y15**).

The distributor also distributes auction proceeds. This operation occurs in segment B. Recall that 5% of auction proceeds are used to initialize an advance rent account, while the other 95% are distributed as rent. Typically, auction proceeds will be in dollars, particularly in the early days of the ABC. In this simulation, it is assumed that all auction proceeds are in dollars. Version 6.1 defines an altogether different procedure when the auction proceeds are in Elsies. This simulation does not allow for that possibility. Readers are encouraged to add this processing with the sequestration of Elsies used in bidder arbitrage.

If all the land fund is to be kept in Elsies, the percent of rent and auction proceeds that must be held in the Elsie distributor is 56% (26.25% land fund, 26.25% EDSF, and 3.5% dividend). These Elsies will typically come from the market maker and always come from the market maker in the simulation. The number of Elsies is (**95% * 56% * AM16/MM_Top**). Where (**AM16**) is the auction proceeds, where MM_Top is .9915 dollars/Elsie.

In segment D, the distributor receives rent dollars that the market maker must convert to Elsies. This is computed in column S and is typically zero, as rent is always paid in Elsies in the simulation. However, the 5% of auction proceeds that go to the advance rent fund as dollars will cause the value computed in column S to be non-zero in the first few months until Elsie rents predominate.

The final operation in segment D, before distribution in segment E, removes those Elsies to be converted to U.S. dollars (**R16**) through the market maker.

The Elsie Distributor is a red-headed column, holding Elsies in segments B, C, and D.

Dividend Payable

```
=IF ($B16="E", Y15 * E16/56%, 0)
```

The dividend payable is typically 3.5% of the total rents and auction proceeds or 3.5% out of the 56% of rents and auction proceeds held by the Elsie distributor(Y15) for the dividend payable, EDSF, and land fund.

Period	Segment	Dividend Payable	EDSF	Total Accounts
2	A	0.00	0.00	32.7496
2	B	0.00	0.00	32.7496
2	C	0.00	0.00	32.7496
2	D	0.00	0.00	32.7496
2	E	0.56	4.18	31.4360
3	A	0.00	4.18	39.6175
3	B	0.00	4.18	39.6175
3	C	0.00	4.18	39.6175
3	D	0.00	4.18	39.6175
3	E	0.00	4.21	39.6082
4	A	0.00	4.21	39.6082
4	B	0.00	4.21	39.6082
4	C	0.00	4.21	39.6082
4	D	0.00	4.21	39.6082
4	E	0.15	5.31	39.2632

However, should the Elsie trade on the market at less than 99% of peg (at the start of segment C, or using some daily average), the computed dividend percentage is held in (**E16**).

Dividend payable is a red-headed fund that holds Elsies during segment E. By Segment A of the following period, the dividend payable will be paid, and this column is zeroed out. The two recipient columns, retail holders and the market maker know how to divide the dividend.

EDSF

```
=AE15 + IF ($B16="E", Y15 * (29.75% - E16)/56%, 0) + IF ($B16="B", 56% * H16/2)
```

The Earth Dividend Subsidy Fund (EDSF) typically receives 26.25% of the total rent and auction proceeds or 26.25% of the percentage held by the Elsie distributor. Strictly speaking, it receives 29.75% minus the share going to the dividend (**E16**), typically 3.5% if the Elsie trades at 99.00% of peg or better. Like the dividend payable, it receives its rent payment from the distributor(**Y15**) in segment E. Unlike the dividend payable, the EDSF accumulates throughout Phase I.

The EDSF is funded from Elsies received in rescue mode. Half the Elsies go to the philanthropist, and the other half are distributed as rent in immediate-delayed mode. However, in rescue mode, the EDSF additionally receives that portion of rent for the dividend and land fund.

Seventeen years before the end of Phase I, dividends can be awarded to residents of Phase II communities or Earth Dividend auction winners. This is done by transferring the actuarial present value of the Earth Dividend from the EDSF to a present value fund and then distributing the Earth Dividend each month to each recipient. The movement of Elsies out of the EDSF and present value fund and into circulation is tiny compared to the value of those funds and not shown in the simulation. In this simulation, Elsies in the EDSF are permanently sequestered.

Delayed Disbursement

=AA15 + IF ($B16="B", 44% * H16/2 ,0) – IF (AND ($B16="C", P15 < 0, AA15 > 0), MIN (-P15, AA15))

Delayed-immediate disbursement is used on 95% of auction proceeds, 50% of rescue purchases, and 50% of direct mode purchases. In this simulation, 100% of auction proceeds are assumed to be in U.S. dollars, so there is no delay in dollar distributions to the ABC, VTLM, and counties. Direct mode purchases are not handled in the simulation. Rescue purchases are handled in the simulation. In rescue purchases, 50% of the Elsies minted (**H16/2**) are subject to immediate-delayed distribution. The 44% of rents going to the ABC, VTLM, and counties are delayed.

Delayed distributions are Elsie inventories offered at 99.16% of the peg. Major market makers set MM_Top at 99.15%. Only when their stocks are depleted will the delayed distributions occur. Delayed distribution offerings are first-in, first-out by county, although there is no such distinction in the simulation.

If the market maker inventory is depleted (**P15 < 0**) and there is a positive balance in the 99.16% inventory (**AA15 > 0**), sell as much of the inventory as the market maker deficit will allow (**MIN (-P15, AA15)**), at 99.16%. Dollars received go directly to the dollar distributor.

Period	Segment	Market Maker (Mil LC$)	Dollar Distributor	Retail Elsies	Delayed Disbursement	Total Dollars Input (Mil $)
579	A	199		6,380.59	1,938.83	**$52,378**
579	B	-13	$33.87	6,380.59	1,938.83	**$52,626**
579	C	-13	$47.26	6,394.09	1,925.33	**$52,639**
579	D	49	$113.10	6,394.09	1,925.33	**$52,639**
579	**E**	49		6,394.09	1,925.33	**$52,639**
580	A	212		6,402.11	1,925.33	**$52,663**

In this table, the market maker has a $13.5 million inventory deficit in segment B. This causes $13.5 million of Elsies to be sold from the 99.16% inventory (Delayed Disbursement). The Elsies move to the retail column, and the dollars paid go to the distributor for distribution to the ABC, VTLM, and counties.

Rescue Mode

=H22 or manual entry in month 1

Starting in segment B of month 2 of year 2 (14-B), the value from one year earlier is duplicated. The value placed in segment B of month 2 of year one is replicated yearly. One-time rescues can be placed in segment B of month 1.

Users of the spreadsheet are encouraged to experiment with formulas and manual entries, including those that consider inflation and growth of the ABC.

Period	Segment	MM Demand (Mil $)	Percent Peg	Dividend Percent	Retail Supply Shock(+) Demand Shock(-)	MM Supply Shock(+) Demand Shock(-)	Rescue Mode
0	E	$6.00	99.00%	3.50%	0	0	$0
1	A	$6.00	99.00%	3.50%	0	0	$0
1	B	$1.58	99.00%	3.50%	0	0	$0
1	C	$1.58	99.00%	3.50%	0	0	$0
1	D	$1.58	99.00%	3.50%	0	0	$0
1	E	$1.58	99.00%	3.50%	0	0	$0
2	A	$1.58	99.00%	3.50%	0	0	$0
2	B	$0.96	99.00%	3.50%	0	0	$300
2	C	$69.15	99.00%	3.50%	0	0	$0
2	D	$69.15	99.00%	3.50%	0	0	$0

The entry in 2-B is $300 million of rescue purchases per year. If the number of properties in a typical rescue is 400, this would represent three rescues in 2022 dollars.

Rescued properties pay no rent, so they typically treble at once (for $1). The philanthropist gets 50% of the Elsies minted and 50% of the structure and premium on treble. Tax breaks could allow the philanthropist to break even or profit from the rescue. Candidates for rescuers, beyond philanthropists, are large industries leaving an area as a gesture of goodwill, local lenders fearing a real estate market collapse, and county boards fearing blight.

Ongoing Retail Trade

=IF ($B56="A", I15+(M16 - M11) * M7, I15)

Ongoing retail trade is another method of representing the retail holding of Elsies. In this case, the current retail trade holdings are a linear function (**M7**) of the property value this month(**M16**) minus the property value in the previous month (**M11**), slowly growing in all periods and segments. The M in M16 and M7 is a coincidence of positioning and has no other meaning.

Retail trade includes those holding Elsies for any reason outside of market making and natural dividend demand, which is much lower than temporary dividend demand. Ongoing retail trade can be used with manual one-time purchases to model cases.

Values of M7 above 63% will terminate Phase I as fast as logistics allow, even if the discrete spreadsheet shows delays that will not exist in the continuous implementation.

M7 is set to zero when modeling natural demand.

Retail Elsies

=Z15 + IF ($B16="B", H16/2) + (I16 - I15)/MM_Top + IFERROR (IF ($B16="A", AD15 * Z13/ (P13 + Z13)), 0) – IF (B16="E", F16, 0) – IF (B16="A", F16, 0) + IF (AND ($B16="C", P15 < 0, AA15 > 0), MIN (-P15, AA15))

These are the Elsies in general circulation. The category includes Elsies held by merchants, suppliers, and consumers for trade, as well as Elsies held by investors for dividends, appreciation, or to accelerate the movement to land-based capitalism.

It is comprised of four inputs. The first two are discussed in the columns just described. They are rescues found in (**H16**). Recall that 50% of the Elsies minted for a rescue goes to the rescuer (**H16/2**). The other input is a retail segment that builds over time, “Ongoing Retail Trade.” This is found in(**I16**). Because this is a red-headed column that contributes toward total accounts, all Elsies are unique. We only account for

the difference in the retail trade between this and the previous segment, as the rest has already been accounted for. The difference between this month's totals and last month's totals converted to Elsies through the market maker (**(I16 - I15)/MM_Top**) are the Elsies added to this column.

The next input comes from dividends payable (**AD15**). Retail Elsies and Elsies currently held by the market maker are eligible for the dividend. Although the dividend is paid in segment A, eligibility is determined in the previous period's segment C. Elsie Rent and Elsie Distributor columns, both artifacts of the simulation, are, like the advance rent fund from which they came, not eligible. Only market maker Elsies in (**P13**) and retail Elsies in (Z13) qualify. The dividend is a function of dividends payable multiplied by the proportion of eligible Elsies in retail. The IFERROR substitutes 0 when a divide-by-zero error occurs where the market maker has yet to acquire Elsies, and the simulation does not include a retail segment.

Period	Segment	Retail Elsies	Sequestered Treble Arbitrage	Dividend Payable	EDSF	Total Accounts
105	A	7.92	6.19	0.00	19.70	65.8120
105	B	7.95	6.19	0.00	19.70	65.8120
105	C	7.95	6.19	0.00	19.70	65.8120
105	D	7.95	6.19	0.00	19.70	65.8120
105	E	7.95	6.19	0.02	19.84	65.7676
106	A	7.95	6.21	0.00	19.84	65.7676
106	B	7.98	6.21	0.00	19.84	65.7676
106	C	7.98	6.21	0.00	19.84	65.7676
106	D	7.98	6.21	0.00	19.84	65.7676
106	E	7.98	6.21	0.02	19.98	65.7230

The subsequent two operations handle demand and supply shocks. The market maker takes segment E shocks, and the ABC handles segment A demand shocks with ram and jam.

In the final operation, retail Elsies are purchased from delayed disbursement when the market maker inventories are depleted (P15 < 0) and 99.16% of inventories exist (**AA15 > 0**). Elsies purchased are the smallest of either the market maker deficit or the size of the 99.16% inventory (**MIN (-P15, AA15)**).

Sequestered Treble Arbitrage

=IFERROR (IF (D11 < 99%, 100%, M4) * (M11 * (4/3)/12 + 1.25% * M11/4), 0) * (100 - D11 * 100)

If the goal is to pay the lowest rent, the most efficient rental strategy is to allow one's rent to fall until trebled and then match the trebler (or surrender the property). However, for those at the very top, high rents bring aristocracy and bragging rights (in land-based capitalism, rents are the new Rolex). For those who live paycheck to paycheck, lack of liquidity prevents matching the trebler. Some would rather pay monthly rent and avoid the hassle of being trebled every year. Everyone will not use the efficient rental strategy.

While treblers tend to be more sophisticated than property bidders at auction and more invested in the AFFEERCE business plan, there is no assurance that all of them will use Elsies to take advantage of the 0.85% arbitrage discount.

If everybody used the efficient rental strategy, and all treblers used Elsies, the value of the M4 parameter should be set to 100%. If 75% of the property owners used the efficient rental strategy and

66.67% of treblers used Elsies, M4 should be set to (75% of 66.67% =) 50%. This is the value used by default in runs of the simulation testing the effect of other parameters.

In the rare event of deep discounting (**D11 < 99%**), where the percent of peg falls below 99%, all properties are open season for the trebler, and the trebler will always use Elsies, so 100% is used, rather than the percentage in M4.

Because the trebling of those using the efficient rental strategy occurs about once per year, the amount in escrow is a function of 1/12th of the property value. M4 is multiplied by 133% (4/3) of the property value in the previous month. Added to this is 1/12 of the rent, but since the amount must be tripled, it is divided by 4. The trebler must also triple the rent, which on average is 2.49% of the total property value in the previous month. Instead of 2.49%, the value used is half or 1.25%. If 2.5% is the average rent, the treble danger rent is half that and the trebled rent is 3.75%. Rational trebles only occur at the treble danger line, not at the average rent line (although rationality in purchasing is not a typical human trait).

Sequestered treble arbitrage improves the dividend by limiting the Elsie pool but does not affect the average rent paid except to enforce it. Natural demand for Elsies is reflected in the increase of this arbitrage pool from month to month.

At the end of the formula, notice that everything is multiplied by 100 – D11 * 100. D11 is the current percent of the peg, typically 99%. So, under normal circumstances, this evaluates to the multiplicative identity 1. However, this number increases in the event of deep discounting. 98% is 2, 97% is 3, and 96% is 4. The TAD table in The Effect of a VIP$ Discount on Treble Arbitrage shows a four multiplier for 40% land share at 96%. The TAD curve is relatively linear above 90%, so this approximation is reasonable.

Market Maker Elsie Account

= P15 – IFERROR (IF ($B16="B", 2.49% * M11/12, 0), 0) * 99%/D16 - IF ($B16="B", 56% * 95% * AM16/MM_Top, 0) + IF (AND ($B16="A", J16 > 0), (J16 - O16), 0) – IF (B16="D", S16/MM_Top, 0) + IF ($B16="D", R16, 0) - (AB16 - AB15) + IFERROR (IF ($B16="A", AD15 * P13/(P13 + Z13)), 0) - (I16 - I15)/MM_Top + IF ($B16="A", IF (AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/99.05)), AC15)) + IF(B16="E", F16)

The market maker is at the center of all currency conversion in the simulation.

The market maker has two inventories: an inventory of U.S. dollars and an inventory of Elsies. This account is the inventory of Elsies. As such, it is a red-headed column.

In an implementation, the Elsie inventory can become depleted, but in the simulation, temporary depletion of the Elsie inventory is depicted as a negative number. A negative number in this column means the purchaser needed to use U.S. dollars or persuade a retail Elsie holder to sell them Elsies below 100% peg.

The ABC is the primary market maker. Market making is profitable, so there could be competition. Although multiple market makers lower the profits, they speed up Phase I. The highest profits occur (about a 36% return) when the inventory is the size that turns over daily. In the early days, the ABC might do ram and jam once a month or less. Nobody but the ABC will be the market maker because even small inventories will be idle. As natural demand increases the rate of purchases, the need for more market-

making inventory increases, which speeds up purchases even faster. The ABC market-making inventory is an investment, as needed, from ABC's profits. If ABC profits are insufficient and others do not step up, some property owners and treblers will be forced to use U.S. dollars for transactions. This condition shows up as a negative number in this column.

Every operation in the Elsie inventory requires an "almost equal" and opposite transaction in the dollar inventory. The "almost" refers to the spread or source of market maker profits.

From the starting inventory (P15), the first operation in segment B subtracts Elsies for the rent to be paid to the advanced rent fund: 2.49%/12 x the previous month's property value (**M11**). The "almost equal and opposite" transaction was the property owner's payment of dollars for these Elsies. "Almost equal" because instead of **-2.49% * M11/12**, the dollar inventory entry, seen later, is **+2.49% * MM_Top * M11/12**. The difference between an operation in the Elsie inventory and dollar inventory will always be either an MM_Top or MM_Bottom, in one or the other, in either the numerator or denominator. If one is negative, the other will be positive, and vice versa.

The multiplier (**99%/D16**) is typically 1 when D16, the current percent of the peg, is 99%. In the event of deep discounting, rents rise by this amount (if they do not, treblers will push them up even higher).

The next operation, also performed in segment B, subtracts Elsies that originated from auction proceeds (**AM16**) and are headed to the Elsie distributor. The percentage of Elsies from the auction proceeds converted from dollars is 56%. This is inefficient but reasonable since most land funds are destroyed. However, for those that make it into the actual land fund, conversion into Elsies, only to be converted back to dollars during ram and jam, will show a slower simulation versus the implementation. The result is multiplied by 95% of the auction proceeds and divided by MM_Top. Recall that 5% of the auction proceeds go to the advance rent fund and are not part of this distribution.

Why does MM_Top appear in the denominator of the Elsie inventory operation for this operation and in the numerator of the dollar inventory operation for the previous operation? In that operation, the number of Elsies needed was known. The dollars input was based on the known number of Elsies to be output. In this operation, the dollars from auction proceeds are known. The Elsie output is based on the known size of the dollar input.

The next operation occurs in segment A in the event of ram and jam. Elsies created during ram and jam (**J16**) are input into the Elsie inventory. These Elsies are converted to dollars to purchase additional properties. The Elsies converted are equal to the size of the ram and jam minus an average property price (**O16**). The final property's worth is destroyed due to a lack of demand. In the case of the simulation, the market maker purchases Elsies at 99.05% until its Elsie inventory is back to the desired size. When finished, it leaves the ABC holding one average property price worth of Elsies that must be destroyed. Reality is far more complex, with sales down to 99.01%, multiple bidders, properties of various prices, and the ABC stopping ram and jam early. However, all of these make the simulation the conservative option.

The next operation occurs in segment D. (**S16**), which holds rent from the dollar advance rent fund that must be converted to Elsies for distribution. These Elsies are leaving for the Elsie distributor, so the sign is a minus. The dollar amount is the known quantity, so the MM_Top appears in the denominator of the Elsie inventory operation. Rent is a confusing term here. The first operation was monthly rent from

property owners, who converted their dollars to Elsies to save 1% from the arbitrage. This operation is rent from the dollar advance rent fund that must be converted to Elsies for distribution to Elsie recipients. This operation only occurs in the early months of the simulation, where the advance rent fund in dollars funded from auction proceeds exceeds the size of the advance rent fund in Elsies from ordinary rent payments.

The next operation is an acquisition (+) rather than a disbursal (-) of Elsies. Segment D (**R16**) holds the Elsies to be converted to dollars. These Elsies come into the Elsie market maker from the Elsie distributor. Dollars will leave from the dollar market maker for the dollar distributor. Because the number of Elsies is known, the MM_Bottom will appear in the denominator of the operation of the dollar market maker.

The operation that follows applies to all segments (**AB16 - AB15**). The process disburses Elsies to sequester in a treble escrow account. Rather than calculating, this operation disburses the difference between the amount in treble escrow in the previous segment and the amount in the current segment. The number of Elsies is known, so the MM_Top appears in the numerator of the dollar market maker operation.

The next operation is not a market-maker operation. Rather, it is the dividend on all Elsies held by the market maker in segment C of the preceding period. The only Elsies that receive dividends are those held by the market maker and retail Elsies. The ratio is the proportion of market maker Elsies(**P13**) to the total of market maker and retail Elsies(**Z13**): **IFERROR (IF ($B16="A", AD15 * P13/ (P13 + Z13)), 0)**. AD15 is dividends payable. A bug in the spreadsheet increases the size of the dividend for the retail sector when the market maker has a negative inventory. Everything balances because the market maker "contributes" this extra dividend. The result is not material to the simulation.

The next market maker operation (**(I16 - I15)/MM_Top**) is converting retail dollars to Elsies. This is the retail sector's size change from the previous month. The MM_Top is in the denominator here because dollars, not Elsies, are the known quantity.

The next market maker operation (**IF ($B16="A", IF (AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/99.05)), AC15))**) indicates whether the land fund in Elsies should go to the actual land fund (converted to dollars). Alternatively, they are destroyed. Land fund Elsies (**AC15**) are needed in the land fund if the land fund is less than demand for Elsies, and either the land fund is less than $4 million (needed for surprise purchases that might occur to keep the dividend below 6%), or the land fund is insufficient to handle a complete ram and jam run for the current demand. Otherwise, the Elsies will be destroyed. In the implementation, Elsies can be split between the land fund and the garbage pail on any given day. In the simulation, an entire month's worth of Elsies must go one place or the other. This, in addition to the conversion of land fund dollars to Elsies and back again, marks an inefficiency that could see significant improvement in the implementation.

The final operation (+**IF (B16="E", F16)**) is the acquisition or disposition of Elsies from a supply or demand shock. Only in segment E of (**F16**) are the Elsies handled by the market maker. The dollar market maker must know if this was a supply shock (+) or demand shock (-) to decide between MM_Top and MM_Bottom.

Market Maker Dollar Account

= AQ15 + IF ($B16="B", 56%*95%*AM16, 0) – IF ($B16="D", R16 * MM_Bottom) – IF (AND ($B16="A", J16 > 0), (J16 - O16) * MM_Bottom, 0) + IF (B16="D", S16,0) + IFERROR (IF ($B16="B", (2.49% * M11/12) * MM_Top, 0) * 99%/D16 + (AB16 - AB15) * MM_Top, 0) + (I16 - I15) + AR15 – IF ($B16="A", IF (AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/99.05)), AC15 * MM_Bottom)) – IF (B16="E", IF (F16 < 0, F16 * MM_Top, F16 * MM_Bottom))

The dollar market-making account is the equal and opposite counterpart to the Elsie market-making account. When Elsies flow into the Elsie account, dollars flow out of this account, and vice versa.

The operations in one account match those in the other, except one and only one member of the pair has an MM_Top or MM_Bottom in the numerator or denominator.

The operations are shown in a table with the corresponding Elsie account operation. KD stands for a known dollar amount, and KE for a known Elsie amount.

Market Maker Operations Table			
Elsie Inventory	**Dollar Inventory**	**Direction**	**Function**
–IF ($B16="B", 2.49% * M11/12, 0) * 99%/D16	**+IF ($B16="B", (2.49% * I11/12) * MM_Top, 0) * 99%/D16**	D→KE	Property owner pays rent
+ IF (AND ($B16="A", J16 > 0), (J16 - O16), 0)	**– IF (AND ($B16="A", J16 > 0), (J16 - O16) * MM_Bottom, 0)**	KE→D	ABC mints and sells Elsies
-IF ($B16="B", 56% * 95% * AM16/MM_Top, 0)	**+ IF ($B16="B", 56%*95%*AM16, 0)**	KD->E	Convert auction proceeds to Elsies
+ IF ($B16="D", R16, 0)	**– IF ($B16="D", R16 * MM_Bottom)**	KE→D	Convert Elsies in rent payments to dollars
– IF (B16="D", S16/MM_Top, 0)	**+ IF (B16="D", S16,0)**	KD→E	Convert dollars in rent payments to Elsies
- (AB16 - AB15)	**(AB16 - AB15) * MM_Top**	D→KE	Treblers add to escrow
- (I16 - I15)/MM_Top	**(I16 - I15)**	KD →E	Increasing retail trade
+ IF (B16="E", F16)	**– IF (B16="E", IF (F16 < 0, F16 * MM_Top, F16 * MM_Bottom))**	KE → D, D → KE	Demand shock or supply shock in Elsies
+ IF ($B16="A", IF (AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/99.05)), AC15))	**– IF ($B16="A", IF (AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/99.05)), AC15 * MM_Bottom))**	KE → D	Elsie land fund to dollar land fund
+IF ($B16="A", AD15 * P13/(P13 + Z13))	**-**	-	Market maker dividend
-	**+ AR15**	-	Market maker capitalization

Like the Elsie market maker that receives dividends, the dollar market maker also has one non-market maker operation. It is capitalized from a formula in AR15. The ABC is expected to use revenue over operations costs to fund its market maker, but that is not included in the spreadsheet.

MM Net

=AQ16 + P16 * MM_Bottom

MM Net shows the total value of the market maker inventories. It is the sum of the dollar inventory plus the Elsie inventory multiplied by .9905.

In the default spreadsheet, the inventory is initialized to $6 million. Additional capitalization is required if the dollar inventory would go negative. The driving force for controlling inventory in the simulation is the Elsie desired inventory column, whose formulas can be manually overridden without harming spreadsheet balance.

Period	Segment	Market Maker (Mil LC$)	MM Desired Inventory	Total Elsies	MM Net	MM Dollars (Mil $)	Market Maker New Capital (Mil $)	Total Account Dollars (Mil $)
0	E	0	6			$6.00	$0.00	$1,006.00
1	A	4	6	6	$6.00	$2.41	$3.59	$1,012
1	B	4	6	6	$9.60	$6.00	$0.00	$1,012
1	C	4	6	6	$9.60	$6.00	$0.00	$1,012
1	D	4	6	6	$9.60	$6.00	$0.00	$1,012
1	E	4	6	6	$9.60	$6.00	$0.00	$1,012
2	A	5	6	8	$9.60	$5.08	$0.92	$1,014
2	B	-138	6	408	$10.66	$147.61	$0.00	$1,557
2	C	-138	144	408	$10.66	$147.61	$0.00	$1,557
2	D	-138	144	408	$10.66	$147.62	$0.00	$1,557
2	E	-138	144	408	$10.66	$147.62	$0.00	$1,557
3	A	-46	144	551	$10.65	$56.20	$88.06	$1,696
3	B	-70	190	551	$98.73	$168.38	$21.86	$1,743
3	C	-70	190	551	$120.60	$190.25	$0.00	$1,743
3	D	-70	190	551	$120.60	$190.26	$0.00	$1,743
3	E	-70	190	551	$120.60	$190.26	$0.00	$1,743
4	A	43	190	741	$120.67	$77.73	$112.52	$1,931
4	B	3	190	741	$233.23	$229.76	$0.00	$2,004
4	C	3	190	741	$233.23	$229.76	$0.00	$2,004
4	D	3	190	741	$233.23	$229.91	$0.00	$2,004
4	E	3	190	741	$233.23	$229.91	$0.00	$2,004
369	E	456	9,095	543,252	$12,939.16	$12,487.97	$0.00	$854,264
370	A	3,978	9,095	550,392	$12,944.18	$9,004.14	$90.71	$859,428
370	B	-219	9,095	550,392	$13,039.09	$13,256.42	$0.00	$865,571
370	C	-219	9,314	550,392	$13,039.09	$13,256.42	$0.00	$865,571
370	D	410	9,314	550,392	$13,039.09	$12,632.68	$0.00	$865,571
370	E	410	9,314	550,392	$13,039.09	$12,632.68	$0.00	$865,571
371	A	4,073	9,314	557,747	$13,044.21	$9,010.32	$303.94	$871,071
371	B	-197	9,314	557,747	$13,352.42	$13,547.71	$0.00	$877,326
371	C	-197	9,511	557,747	$13,352.42	$13,547.71	$0.00	$877,326

The market maker began with $6 million to start. In month 2, note that a negative Elsie inventory indicates some property owners were forced to use U.S. dollars to pay rent. This deficit was caused by the closing and auction of the initial property purchase in month 2. The market maker inventory of Elsies was insufficient to handle the transactions that resulted from this purchase.

MM Net is the sum of the red-headed market maker Elsie column (x .9905) and the purple-headed MM Dollars column. It will always increase. The purple heading on the dollars column indicates that it is a repository of dollars whose sum must equal the total dollars inputted into the system.

By month 370, the MM Net has grown to $12.9 billion. Injections of small amounts of capital happen regularly.

MM Desired Inventory

```
=MAX (Q15, IF (AND (P15 < 0, P14 > 0), Q15 - P15)) - G15 + IF (AND (B16="B", P15 < 0), -P15)
```

Estimating desired market maker inventory is difficult when the optimal strategy depends on the source of funds. In the implementation, this is a judgment call on the part of the market maker. If the inventory is too small, it will frequently become depleted (negative), and opportunities will be missed. If the inventory is too large, profit margins will be small.

Sudden purchases lead to large swings in the inventory, which can be used as a trigger. Slow, steady inventory investments leave a different set of evidence. Readers are encouraged to seek better formulas (and let me know if you find something promising).

If the inventory shifts from positive to negative (**AND (P15 < 0, P14 > 0)**), set the desired inventory to the maximum of the current desired inventory and the difference between the current desired inventory and the current inventory (which is negative).

Users can adjust inventory from the MM demand and supply shocks columns (**G15**). This is different from its neighboring retail demand shocks and supply shocks column. These adjustments are added or subtracted to/from the desired inventory.

If the inventory in segment B is negative, then add the absolute value of that deficit to the desired inventory.

MM Demand

```
=MIN (Q15 - P15, Q15)
```

The driving demand of the entire simulation is just the desired Elsie inventory(**Q15**) minus the current Elsie inventory(**P15**), as described above. However, if the current inventory goes negative, the desired inventory increases to account for that. Demand that accounts for the difference will be twice the actual demand, so if P15 is negative, then the demand is just Q15.

Retail Demand and Supply Shocks

```
=IF (B41="E", IF (AK41 > 9%, MIN (-30, -30*M40/10000), IF (AK41 > 8%, MIN (-15, -15 * M40/10000), IF (AK41 > 7%, MIN (-7, -7 * M40/10000), IF (AK41 > 6%, MIN (-2, -2 * M40/10000), 0)))), 0)
```

The formula has very little to do with retail demand and supply shocks. Nor is it used until dividend spikes associated with process start-up have passed. Once the dividend stabilizes, it enters a demand shock to be handled by the market maker if the dividend rises above 6%. This seems like a reasonable value based on the yield curve at the time of this writing. This demand for yield is considered natural demand because a certificate of deposit (in U.S. dollars) can be profitably issued to buyers once the dividend passes all points on the yield curve.

Changing the minimum dividend before natural demand kicks in from 6% to 7% increases the duration of Phase I from 235 years to 268 years for 5% growth and from 293 to 340 years for 4% growth. The formula can be deleted to test natural demand without dividend processing.

Independent of the automatic retail demand that is set by the formula for dividend processing, retail demand, and supply shocks are typically entered manually.

Demand shocks are entered as negative numbers, and supply shocks are positive. In segment E, entering -500 means a demand for 500 Elsies from the market maker at 99.15% to be deposited in the retail Elsies column. Setting a value of 420 means a sale of 420 Elsies from retail to the market maker, purchased at 99.05%.

A demand shock manually entered in segment A, such as -2000, means a demand from the ABC for 2,000 Elsies produced during ram and jam. If the market maker inventory is insufficient, requests should be made in segment A. This reflects the implementation, where the market makers will handle rents and minor purchases of Elsies. Most will not have sufficient inventory for large purchases, nor is their high price, 99.15%, suitable for large purchases where a tenth of a percent is material. To win Elsies at 99.05%, the buyer must be prepared to wait for ram and jam and for the market makers to replenish their inventory.

Market Maker Supply and Demand Shocks

0

This field can control the desired level of market maker inventory. It is not so much a supply shock as a new lower limit on inventory restocking. A value of +100 will decrease the market maker's desired inventory by 100. A value of -800 will increase the market maker's desired inventory column by 800. This is a demand shock that will trigger increased ram and jam.

Percent of Peg

=IF (B16="A", MIN (99%, IF (C16 > Q15/1000, D15 + 0.1%, D15)), D15)

This evaluates to 99%, the default percent of peg where the Elsie trades. However, if the value in the previous period is lower(**D15**), it will use that value unless the current demand(**C16**) is positive and

greater than the current desired Elsie inventory of the market maker(**Q15**) divided by 1000. If that is the case, it will add 0.1% to the previous value.

In the event of a retail dump, demand will turn negative. If the red (negative values) extends for more than one month, the percent of the peg must be manually adjusted in segment A in the first month, which is all red. The goal is to find the highest percentage of peg, where the demand returns to black the following month. Once this is done, the peg percentage returns to 99% as fast as the market allows.

The lowest setting seen in tests is 93.2%. Recovery time can range from 2 months to 20 years. In the implementation, recovery times can vary from 2 seconds to 20 years. In all simulations, Phase I completes faster with a purchase and dump than if the purchase was never made. When retail is a fixed percentage of property value, Phase I can finish more quickly with the purchase and dump than the purchase alone. That is because retail is a percentage of property value that does not drop with the dump. Retail Elsies are restored at once, according to the formula, and purchase property for a second time.

Dividend Percent

```
=MIN (29.75%, 3.5% + (99% - D16) * 10)
```

During deep discounting, the dividend distribution increases at the EDSF's expense, up to a maximum dividend distribution of 29.75% of the rent. The formula is the base 3.5% plus 99% - the current percent of peg (**D16**) times 10.

Contract Escrow Plus Purchases

```
=AS15 + J16 + H16 + IF (AND (B16="A", F16 < 0), -F16)
```

This purple-headed column shows the value of signed contracts and purchases. It is the only expenditure of U.S. dollars accounted for in the spreadsheet. Dollars that come into the system are paid out for property. All other expenses come from the operating budgets of the VTLM and ABC.

Added to the current purchases are ram and jam contracts (**J16**), rescued properties (**H16**), and properties purchased through ram and jam from Elsie demand that bypasses the market maker (**IF (AND (B16="A", F16 < 0), -F16)**).

Period	Segment	Contract Escrow+Purchases (Mil $)	ABC (Mil $)	VTLM (Mil $)	Counties (Mil $)	Land Account + Land Fund Loan(Mil $)	Total Account Dollars (Mil $)
0	E					$1.00	**$7.00**
1	A	$6	$0.00	0.00	0.00	$0.69	**$13**
1	B	$6	$0.00	0.00	0.00	$0.69	**$13**
1	C	$6	$0.00	0.00	0.00	$0.69	**$13**
1	D	$6	$0.00	0.00	0.00	$0.69	**$13**
1	E	$6	$0.00	0.00	0.00	$0.69	**$13**
2	A	$8	$0.00	0.00	0.00	$0.42	**$15**
2	B	$408	$0.00	0.00	0.00	$0.42	**$558**
2	C	$408	$0.00	0.00	0.00	$0.42	**$558**
2	**D**	$408	$0.00	0.00	0.00	$0.42	**$558**
2	**E**	$408	$0.20	0.20	0.86	$0.42	**$558**
3	A	$553	$0.20	0.20	0.86	-$0.44	**$698**
3	B	$553	$0.20	0.20	0.86	-$0.44	**$744**

The table shows Contract Escrow + Purchases and several other purple-headed columns whose values are summed to show Total Account Dollars in green. Not all purple-headed columns, including advance rent dollar fund and market maker dollar inventory, are shown. Most dollars that enter the system end up as property purchases.

ABC

=AT15 + IF ($B16="E", V15 * 7%/44%, 0)

Using the projected Phase I conditions in the above table (under Contract Escrow + Purchases), the ABC has a total accumulated revenue of $200,000 by month 2. Things improve markedly by month 6, with accumulated income up to $9.38 million. As a purple-headed column, it must accumulate revenue. Another column breaks out the monthly income of the ABC and VTLM, which receive the same distribution.

The ABC brings in 7% of the ground rent, or 7% of the revenue in the dollar distributor(**V15**). This is 44% (7% ABC, 7% VTLM, 30% county) and is paid in segment E. This is ground rent from the advance rent funds and 95% of dollar auction proceeds.

Under the projected Phase I conditions, the total revenue received by the ABC in 59 years is $2.7 trillion. With 2% inflation, this equals approximately $1.04 trillion in 6.0. However, the return is 1/3 as good because the duration is 60 years rather than 20. While the ABC real revenue (revenue minus inflation) of Phase I is constant (it is a function of 80 million $250,000 (2022 dollars) purchased into the Commons Trust), the return is a function of how fast Phase I can be achieved.

ABC/VTLM Monthly Revenue

=IF ($B16="E", V15 * 7%/44%, 0)

Same as the ABC purple-headed column, but not accumulating. Records the 7% ground rent distributions received by the ABC and VTLM every month.

VTLM

```
=AU15 + IF ($B16="E", V15 * 7%/44%, 0)
```

The VTLM (VIP Treasury and Land Management) is a not-for-profit organization in charge of the Commons Trust charters, land management, and the currency. All its funding goes for operations, including installing networks, if needed, and biometric readers (free, in some cases).

A conflict of interest will likely develop if started by the same collective as the ABC. This should be avoided. Government regulation of the VTLM is sought.

The VTLM is paid in U.S. dollars during segment E, with 7% out of the percent of funds in the dollar distributor (**V15**), which holds 44% of all rent distributions. This is ground rent from the advance rent funds and 95% of dollar auction proceeds.

Counties

```
=AV15 + IF ($B16="E", V15 * 30%/44%, 0)
```

The spreadsheet does not distinguish between counties. In an implementation, each county receives rent revenue only from properties in that county and auction proceeds only from auctions of properties in that county. The same holds for any jurisdiction where the agreement is signed.

Counties receive 30% of the ground rent or 30% out of the percentage of ground rent allocated to the dollar distributor(**V15**) and auction proceeds in dollars allocated to the dollar distributor.

For auction bids in cash on 40% land share property, the county receives 30% of 95% of 50%, or over 14% of the purchase price at closing (plus other closing costs that go to the county). They then receive 30% of 2.49% of the purchase price annually, or 0.747%. For Colorado and California counties, this is a windfall. However, even those counties with a 2% property tax will be ahead for over ten years. During that time, the developmental growth of properties with no property tax will more than compensate for the lost revenue.

Land Account + Loan Account

```
=K16 + L16
```

This account is just what it claims to be. It is the sum of the land account and the deficit loan account. Unlike those accounts, it is a purple-headed column used to compute total dollar accounts.

The land fund is both a U.S. dollar account and an Elsie account. It is the U.S. dollar account that is summed.

Advance Rent Fund (U.S. Dollars)

=T15 + IF ($B16="B", 5% * AM16, 0) – IF (B16="C", T15/12, 0)

Period	Segment	Advance rent funds (Mil dollars)	Dollar Rent	Dollar Distributor
0	E			
1	A	$0.00	$0.00	$0.00
1	B	$0.00	$0.00	$0.00
1	C	$0.00	$0.00	$0.00
1	D	$0.00	$0.00	$0.00
1	E	$0.00	$0.00	$0.00
2	A	$0.00	$0.00	$0.00
2	B	$0.30	$0.00	$4.00
2	C	$0.28	$0.03	$4.00
2	D	$0.28	$0.00	$4.01
2	E	$0.28	$0.00	$0.00
3	A	$0.28	$0.00	$0.00
3	B	$0.28	$0.00	$0.00
3	C	$0.25	$0.02	$0.00
3	D	$0.25	$0.00	$0.01
3	E	$0.25	$0.00	$0.00
4	A	$0.25	$0.00	$0.00
4	B	$0.32	$0.00	$0.90
4	C	$0.29	$0.03	$0.90
4	D	$0.29	$0.00	$0.91
4	E	$0.29	$0.00	$0.00

The U.S. dollar advance rent fund is funded with rents paid in U.S. dollars and 5% of auction proceeds paid in U.S. dollars. This simulation assumes all rent is paid in Elsies and all auction bids are U.S. dollars, which, for the most part, is expected to be true. The dollar advance rent account is funded only with 5% of the auction proceeds (**AM16**). If a column for rent paid in dollars is added to the spreadsheet, that would also need to be added here.

Added to the current value of the advance rent fund (**T15**) is 5% of the auction proceeds in segment B. In segment C, 1/12 the fund's current value is removed for distribution. Dollar rents and Elsie rents distributed in the same period are comingled. If the dollar rents exceed 44% of the total, the excess is sent to the market maker to be converted to Elsies. If Elsie rents exceed dollars (which is typical), excess Elsies are sent to the market maker for conversion. In an implementation, this must be done on a county-by-county basis.

Note that this is a purple-headed column that contributes to the total of all dollar accounts.

Dollar Rent

=IF ($B16="C", T15/12, 0)

Dollar Rent is a temporary holder of U.S. dollars. 1/12 of the U.S. Dollar advance rent fund(**T15**) is moved here in segment C and out in segment D, returning the field to zero. It does hold the dollars for that one segment and must be a purple-headed column to maintain spreadsheet balance.

Dollar Distributor

=IF ($B16="E", 0, V15 + IF (B16="B", 44% * 95% * AM16, 0) + IF ($B16="D", R16 * MM_Bottom) + IF ($B16="D", U15-S16)) + IF (AND ($B16="C", P15 < 0, AA15 > 0), MIN (-P15, AA15) * 0.9916)

The dollar distributor distributes rent and auction proceeds to those recipients who expect dollars. These are the ABC, VTLM, and counties.

The distributor distributes its entire contents in segment E and is reset to zero. Otherwise, operations work on the current value of the distributor(**V15**). If the segment is B, 44% of the 95% U.S. dollar auction proceeds treated as rent are moved to the distributor.

In segment D, the distributor gets dollars from the market maker. The market maker converted rent paid in Elsies to dollars for dollar recipients. The market maker purchases the known number of Elsies in (R16) at MM_Bottom, the number of dollars moved into the distributor.

The dollar rent (U15) is moved into the distributor in segment D. But not all. Some dollar rent, particularly in the early days when dollars predominate, must be converted to Elsies for the EDSF and dividend. The number of dollars to be converted is found in (**S16**).

When Elsies are purchased in the 99.16% inventory, dollars received go directly to the distributor for delayed distribution. In segment C, dollars are taken from delayed distribution when market maker inventory is depleted (**P15 < 0**), and there are Elsies in the 99.16% inventory (**AA15 > 0**). The extent of the sale is the lesser of the size of the market maker deficit or the size of the 99.16% inventory (**MIN (-P15, AA15)**) multiplied by the price paid $0.9916/Elsie.

Dollar Rent to be Converted to Elsies

=IF (B16="D", IF (U15 > 44% * (U15 + X15), U15 - 44% * (U15 + X15), 0), 0)

In segment D, the dollar rent in (**U15**) is checked to see if it is greater than 44% of the total rent needed for dollars. Total rent is the sum of dollar rent and Elsie rent (**U15 + X15**). If there are more dollars than required rent needed in dollars, the rest (**U15 - 44% * (U15 + X15)**) are to be converted to Elsies.

Elsie Rent to be Converted to Dollars

=IF (B16="E", 0, R15 + IF (B16="D", IF (X15 > 56% * (U15 + X15), X15 - 56% * (U15 + X15), 0), 0))

In segment D, the rent in Elsies (**X15**) is checked to see if it is greater than the 56% of the total rent needed to be distributed as Elsies (EDSF 26.25%, Land Fund 26.25%, Dividend 3.5% = 56%). Total rent is the sum of dollar rent and Elsie rent (**U15 + X15**). If the rent in Elsies is greater than the Elsies needed by recipients, the remainder (**X15 - 56% * (U15 + X15)**) is sent off to be converted to dollars.

Period	Segment	Elsie Rent to be converted to dollars (I)	Dollar rent to be converted to Elsies (H)
2	D	0.0000	0.0074
2	E	0.0000	0.0000
3	A	0.0000	0.0000
3	B	0.0000	0.0000
3	C	0.0000	0.0000
3	D	0.0000	0.0056
39	D	0.0894	0.0000
39	E	0.0000	0.0000
40	A	0.0000	0.0000
40	B	0.0000	0.0000
40	C	0.0000	0.0000
40	D	0.0927	0.0000
40	E	0.0000	0.0000
41	A	0.0000	0.0000
41	B	0.0000	0.0000
41	C	0.0000	0.0000
41	D	0.0957	0.0000

Because rent is almost always paid in Elsies, this value will typically be non-zero. The exception is in the early days when the 5% rent from dollar auction proceeds exceeds the monthly rents paid in Elsies.

In the table, dollar rent to be converted to Elsies has positive values in the D segment in early years, and Elsie rent to be converted to dollars has positive values in the D segment in later years. The two columns are mutually exclusive since there can only be a surplus in one direction.

Elsies Created

=AG15 + J16 + IF ($B16="B", H16) + IF (B16="A", -F16)

This is a running total of all Elsies created. Elsies can only be minted when a property is purchased into the Commons Trust. This occurs through ram and jam reflected in (**J16**) and rescued property purchases, reflected in (**H16**) and recorded in segment B. Property can also be purchased with Elsie demand(**F16**) directed at the ABC during ram and jam, bypassing the market maker. Demand is negative, requiring the minus sign. Positive supply in segment A is not functional as it implies privatizing Commons Trust land. There is no provision in either the simulation or implementation to do so.

Elsies Destroyed

=AH15 + IF (AND (J16 > 0, $B16="A"), O16, 0) + IF ($B16="A", IF (AND (K15 < C15, OR (K15 < 4, K15 < (C15 * O15)/99.05)), 0, AC15))

This is a running total of Elsies destroyed. In version 6.0, Elsies Destroyed was an account called the bank and would have been shown as a red-headed column. In 6.1, destroyed Elsies can never be resurrected. They are subtracted from Elsies created to get the total Elsies.

Every theoretical run of ram and jam destroys an average property price's worth of Elsies. In segment A, in the event of ram and jam (**J16 > 0**), Elsies equal in value to the final property purchased (average property value in simulation) (**O16**) will be destroyed. In other words, ram and jam can go on for an arbitrary number of iterations, each subsidized with 1% of the purchase price from the land fund. However, when demand is finally exhausted, one average property price worth of Elsies must be destroyed.

In the simulation, all land funds not converted to dollars are destroyed. In the implementation, all such Elsies are put through ram and jam to either be converted to dollars or destroyed. However, the ABC has the right to save these Elsies until, for instance, there is demand on the market. Or, they can destroy the Elsies, even if there is demand. Dollars received from the sale of Elsies can be used to purchase land at the time or in the future. The simulation is not necessarily optimal.

The condition checks to see if the Elsies are **not to be** destroyed. That way, it matches the state in the land fund where land fund Elsies are converted to dollars, with the if and else clauses reversed. We do not destroy the Elsies if the land fund is less than demand (**K15 < C15**) and either the land fund is less than 4, or the land fund is inadequate to do an entire run of ram and jam with current demand (**K15 < (C15 * O15)/99.05)**). Should the condition fail, the contents of the Elsie land fund (**AC15**) will be destroyed.

Total Elsies

=AG16-AH16

Total Elsies is Elsies created (**AG16**) minus Elsies destroyed (**AH16**).

Period	Segment	Total Accounts	Elsies Created	Elsies Destroyed	Total Elsies
0	E				
1	A	11.7496	12.00	0.25	11.7496
1	B	11.7496	12.00	0.25	11.7496
1	C	11.7496	12.00	0.25	11.7496
1	D	11.7496	12.00	0.25	11.7496
1	E	11.7496	12.00	0.25	11.7496
254	A	681.7009	731.71	50.01	681.7009
254	B	696.7009	746.71	50.01	696.7009
254	C	696.7009	746.71	50.01	696.7009
254	D	696.7009	746.71	50.01	696.7009
254	**E**	696.7009	746.71	50.01	696.7009
255	A	700.2291	750.62	50.39	700.2291
255	B	700.2291	750.62	50.39	700.2291
255	C	700.2291	750.62	50.39	700.2291
255	**D**	700.2291	750.62	50.39	700.2291
255	**E**	700.2291	750.62	50.39	700.2291
256	A	704.5420	755.31	50.77	704.5420
256	B	704.5420	755.31	50.77	704.5420
256	C	704.5420	755.31	50.77	704.5420
256	D	704.5420	755.31	50.77	704.5420
256	**E**	704.5420	755.31	50.77	704.5420

Amazingly, the total Elsies must always be equal to the sum of the Elsies in all the red-headed accounts in the universe. This is called zero-balancing because the difference between these two green columns is zero.

Elsies Earning a Dividend

```
=IF ($B16="C", MAX (AI16 - AE16 - AB16 - W16 - X16 - Y16 - AA16, 0.0001), 0)
```

It would be easier to add together those columns that are eligible for the dividend than to subtract those that are ineligible. The spreadsheet uses subtraction because it is more interesting to enumerate the Elsies that do not qualify. They are removed from total Elsies (**AI16**).

AE16	EDSF
AB16	Sequestered Treble Arbitrage
W16	Advanced rent fund (Elsies)
X16	Elsie rent
Y16	Elsie distributor
AA16	Delayed distribution

Land fund Elsies and dividend payable Elsies also do not qualify, but those columns are always zero in segment C.

Elsies that qualify for the dividend are retail Elsies and market maker Elsie inventory. A good verification check is to see that the column “Elsies Earning a Dividend” equals the sum of those two columns. In the simulation, as opposed to an implementation, the market maker’s inventory of Elsies can go negative. In

that case, the column “Elsies earning a dividend” can be too small, and the market maker pays a dividend (to retail) rather than receiving one.

Dividends are paid to the owner, on record, of Elsies during segment C.

If no Elsies are available for the dividend, often because of negative market maker inventory, .0001 (100 Elsies) are used to prevent a massive overflow spike on the spreadsheet or even a divide by zero. In the implementation, there can be situations where almost all Elsies are locked away, and those holding Elsies during segment C can earn a lottery-win-sized dividend on their Elsies. The dividend will naturally increase as Phase I progresses unless the retail segment grows faster. Phase II dividends grow extremely fast, triggering an ever-deepening deflation, leading to the hyperdeflation.

Annualized Dividend

```
=IF ($B16="E", (AD16/AJ14) * 12, 0)
```

Dividends are paid once per period. In the simulation, this is monthly. In the implementation, it is daily. The annualized dividend is computed in segment E after the dividend payable (**AD16**) has been calculated. The column “Elsies earning a dividend” in segment C (**AJ14**) is divided by the dividend payable column and then multiplied by the number of periods (months) in the year to annualize the result.

Land Backing

```
=40%*M16/AI16
```

The goal of the ABC is to purchase property with an average land share of 40%. When purchased, Elsies are minted equal to the property value, 40% of which is land. Dividing the total property value (**M16**) by the total Elsies (**AI16**) gives the ratio of property value to Elsies. By multiplying this ratio by 40%, the percentage of Elsies that are entirely backed by land is found.

Factors influencing this column are the number of Elsies destroyed and the property appreciation rate set as a simulation parameter. The property appreciation rate includes inflation and the value of new construction on the property, which is expected to be high due to the lack of property taxes. Depreciation reduces Commons Trust property appreciation.

Rapid purchasing will bring down the number of Elsies fully backed by land (as well as the dividend). Slowing down the rate of purchases will raise both numbers. Phase II will be marked by rapid dividend and land-backing increases.

Commons Property Appreciation	4.0%

Total Accounts

=P16 + SUM (W16:AE16) + AN16

This is the total of all the red-headed accounts. To be balanced, the value here must always equal the value in the total Elsies column.

P16	Elsie Market Maker
W16	Elsie Advance Rent Funds
X16	Elsie Rent
Y16	Elsie Distributor
Z16	Retail Elsies
AA16	Delayed Disbursement
AB16	Sequestered Elsies for Trebling
AC16	Land fund Elsies
AD16	Dividend Payable
AE16	EDSF
AN16	Rent Paid by Property Owners

Total Dollars Input

=AO15 + AM16 + IFERROR (IF ($B16="B", 2.49% * M11/12 * MM_Top,0) * 99%/D16 + (AB16 - AB15) * MM_Top, 0) + IF ($B16="B", H16) + (I16 - I15) + IF (AQ16 < Q16, Q16 - AQ16, 0) – IF (B16="E", IF (F16 < 0, F16 * MM_Top, F16 * MM_Bottom)) – IF (AND (B16="A", F16 < 0), F16 * MM_Bottom) + IF (AND ($B16="C", P15 < 0, AA15 > 0), MIN (-P15, AA15) * 0.9916)

This is an accounting of all U.S. dollars input into the AFFEERCE system.

This is a running total; the initial value for the period is (**AO15**). (**AM16**) are the proceeds from the auction. It is assumed in this simulation that all auction proceeds are in dollars.

Property owners buy their rent at an MM_TOP discount to peg from the market maker with the risk-free press of a button, so it is assumed that all rents will be paid this way. The average rent is 2.49% of the property value in the previous month(**M11**) divided by 12, as rent is distributed monthly. The IFERROR handles a bogus last month's property value for the first month when the previous month does not exist on the spreadsheet.

The rent is multiplied by (**99%/D16**), where D16 is the current percentage of the peg where the Elsie is trading. Typically, this value is 99% (the ratio is 1), except during deep discounting when rents are higher.

Treblers, to some extent, purchase Elsies for treble escrow to take advantage of the arbitrage. The number of expected treblers using Elsies is set in the parameter:

Property owners allowing rent to fall and percent of those treblers who use Elsies		50%

However, this column can ignore the parameter and takes the difference of the treble escrow Elsies in the current period and segment versus the number of treble-escrow Elsies in the previous period and segment to compute the dollars spent on the number of treble-escrow Elsies added during the current period (**(AB16 - AB15) * MM_Top, 0)**). If this number is negative, which will only occur on recovery from deep discounting, the market maker will purchase the Elsies at MM_Bottom. This error is not material to the outcome of the simulation.

Rescue mode purchases (**H16**) rarely bring dollars into the system, as they are properties purchased for the Elsies minted, with the U.S. dollars supplied by the donors. However, the property value in dollars (At the peg, dollars equal Elsies) is recorded in the dollar accounts, which is included as a dollar input in segment B. Both can be included, or both can be excluded in the accounting. I choose to include.

(**I16 - I15**) is the ongoing retail trade. It is denominated in dollars, so no conversion is needed. The difference between periods are the new dollars entering the system.

The next operation brings dollars into the system for market maker capitalization. If the market maker's dollar inventory (AQ16) is less than the market maker's Elsie inventory (**Q16**), then increase capitalization by the difference. The new capital will be used to purchase Elsies at MM_Bottom for the Elsie inventory.

Retail supply (+) and demand shocks (-) (**F16**) that go through the market maker occur in segment E. In a supply shock, the market maker pays dollars for Elsies at MM_Bottom. Because this operation is subtracted, it represents a loss of dollars, as supply shocks are positive. In a demand shock, the market maker sells Elsies at MM_Top. Because demand shocks are negative, subtracting a negative represents an increase in dollars. This is the entire operation: (**– IF (B16="E", IF (F16 < 0, F16 * MM_Top, F16 * MM_Bottom))**).

Demand shocks in segment A go through the ABC during ram and jam rather than the market maker. Dollars coming into the system during ram and jam come in at MM_Bottom. This then is the next operation (**– IF (AND (B16="A", F16 < 0), F16 * MM_Bottom)**).

When Elsies are purchased in the 99.16% inventory, dollars received go directly to the distributor for delayed distribution. In segment C, dollars are taken from delayed distribution sales when market maker inventory is depleted (**P15 < 0**), and there are Elsies in the 99.16% inventory (**AA15 > 0**). The extent of the sale is the lesser of the size of the market maker deficit or the size of the 99.16% inventory (**MIN (-P15, AA15)**) multiplied by the price paid $0.9916/Elsie.

Total Dollar Accounts

=SUM (AQ16:AW16) + SUM (T16:V16)

This is the sum of all dollar accounts in the AFFEERCE business plan, including all property purchased. To be balanced, the value here must always equal the value in total dollars input.

AQ16	Market maker dollar account
AR16	Market maker new capital
AS16	Contracts and properties purchased
AT16	ABC operations and profit
AU16	VTLM operations
AV16	County revenue
AW16	Land fund and loan account
T16	Advance rent fund (dollars)
U16	Dollar rent
V16	Dollar distributor

Period	Segment	Total Dollars Input (Mil $)	Total Account Dollars (Mil $)
0	E	$13.00	$13.00
1	A	$14.21	$14.21
1	B	$14.21	$14.21
1	C	$14.21	$14.21
1	D	$14.21	$14.21
1	E	$14.21	$14.21
2	A	$15.07	$15.07
1017	A	$7,916,673.52	$7,916,673.52
1017	B	$7,983,924.41	$7,983,924.41
1017	C	$7,983,924.41	$7,983,924.41
1017	D	$7,983,924.41	$7,983,924.41
1017	E	$7,983,924.41	$7,983,924.41
1018	A	$8,011,456.34	$8,011,456.34
1018	B	$8,079,511.69	$8,079,511.69
1018	C	$8,079,511.69	$8,079,511.69
1018	D	$8,079,511.69	$8,079,511.69
1018	E	$8,079,511.69	$8,079,511.69
1019	A	$8,107,372.95	$8,107,372.95