NBA TopShot

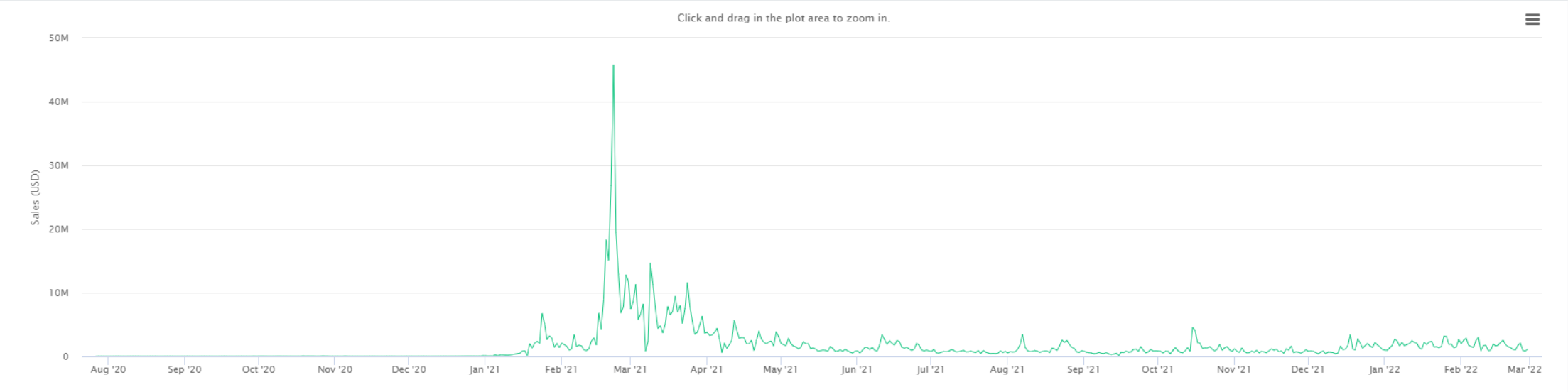
NFTs

- Cryptocurrency:
  - BTC (digit money)
  - ETH (money + applications)
  - NFTs (why not art?)
- What are NFTs?
  - Asset stored on a blockchain.

Differences

- 1 BTC = 1 BTC = 1 BTC
- 1 ETH = 1 ETH = 1 ETH
- 1 Keldon Johnson Dunk ≠ 1 Keldon Johnson Dunk
  - Serial Numbers!

NBA TopShot Market Dynamics

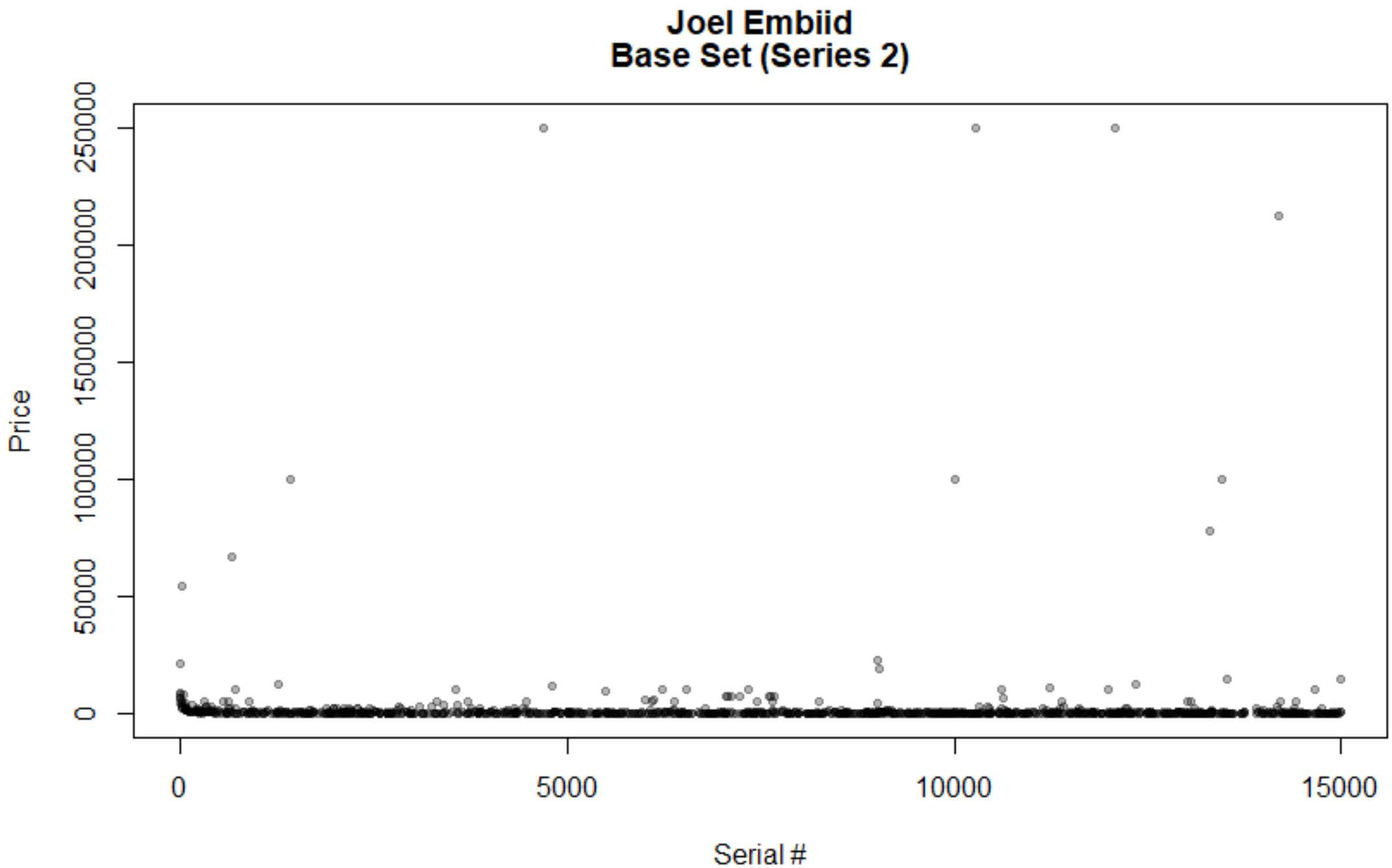


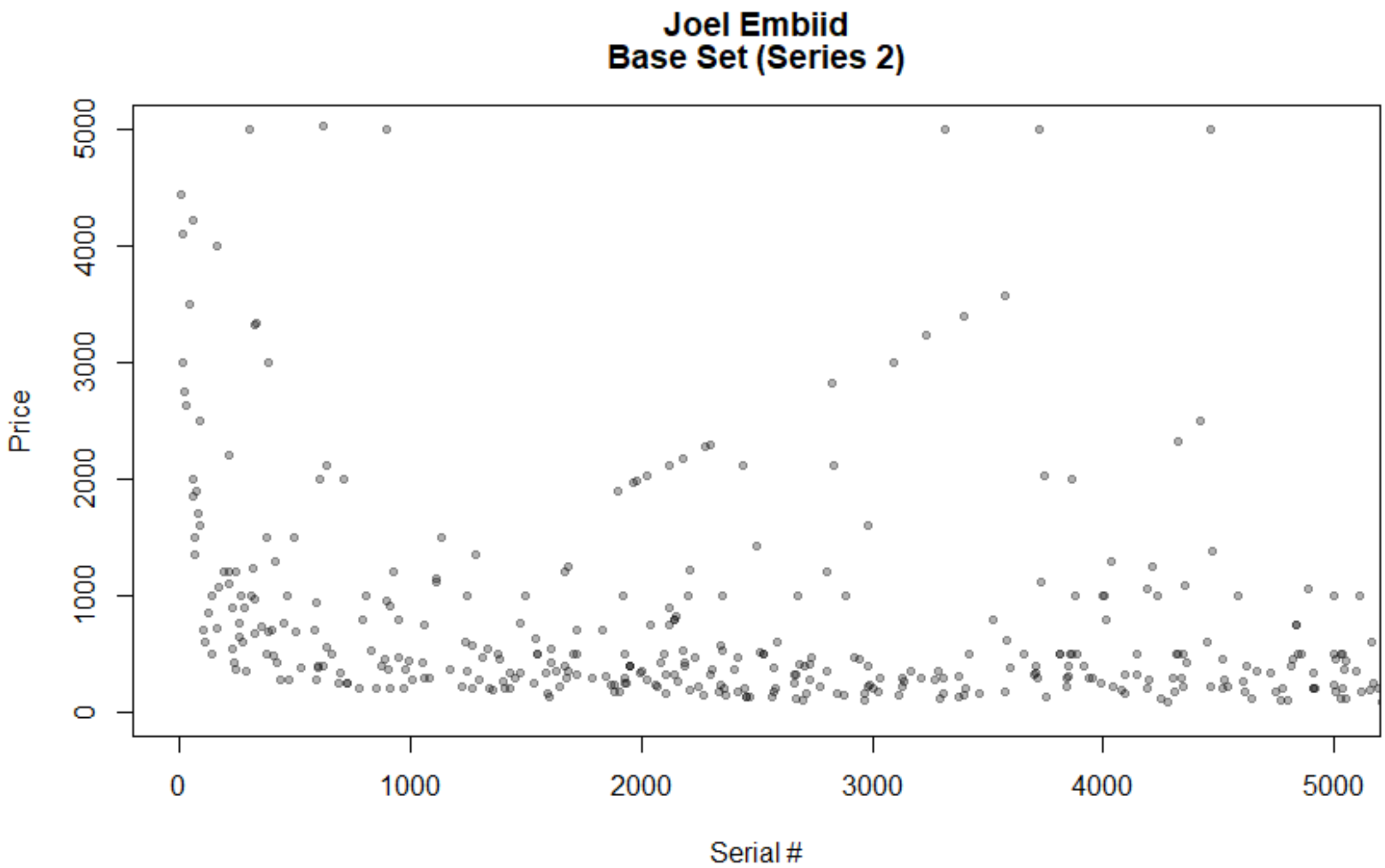
How Should One Trade These?

- Like (Physical) Trading Cards?
- Target good players, rookies, etc.?
- Buy “low” serial numbers?
  - What is “low”?
  - Should I spend an extra $10 for a marginally better serial number?

Example: Joel Embiid

- Link (usable)


Joel Embiid
Base Set (Series 2)
Price
0
50000
100000
150000
200000
250000
0
5000
10000
15000
Serial #

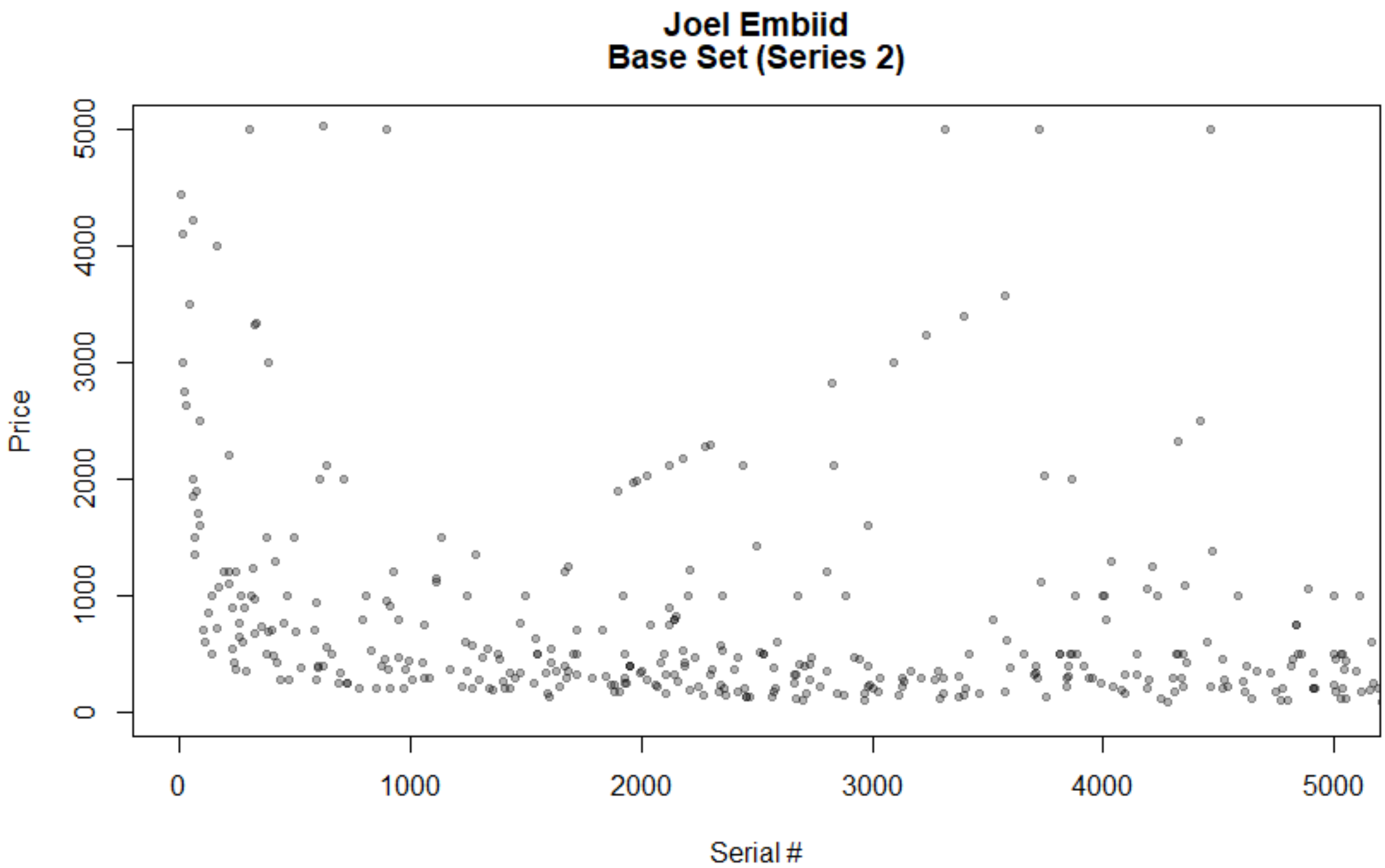

Joel Embiid
Base Set (Series 2)
Price
0
1000
2000
3000
4000
5000
Serial #
0
1000
2000
3000
4000
5000

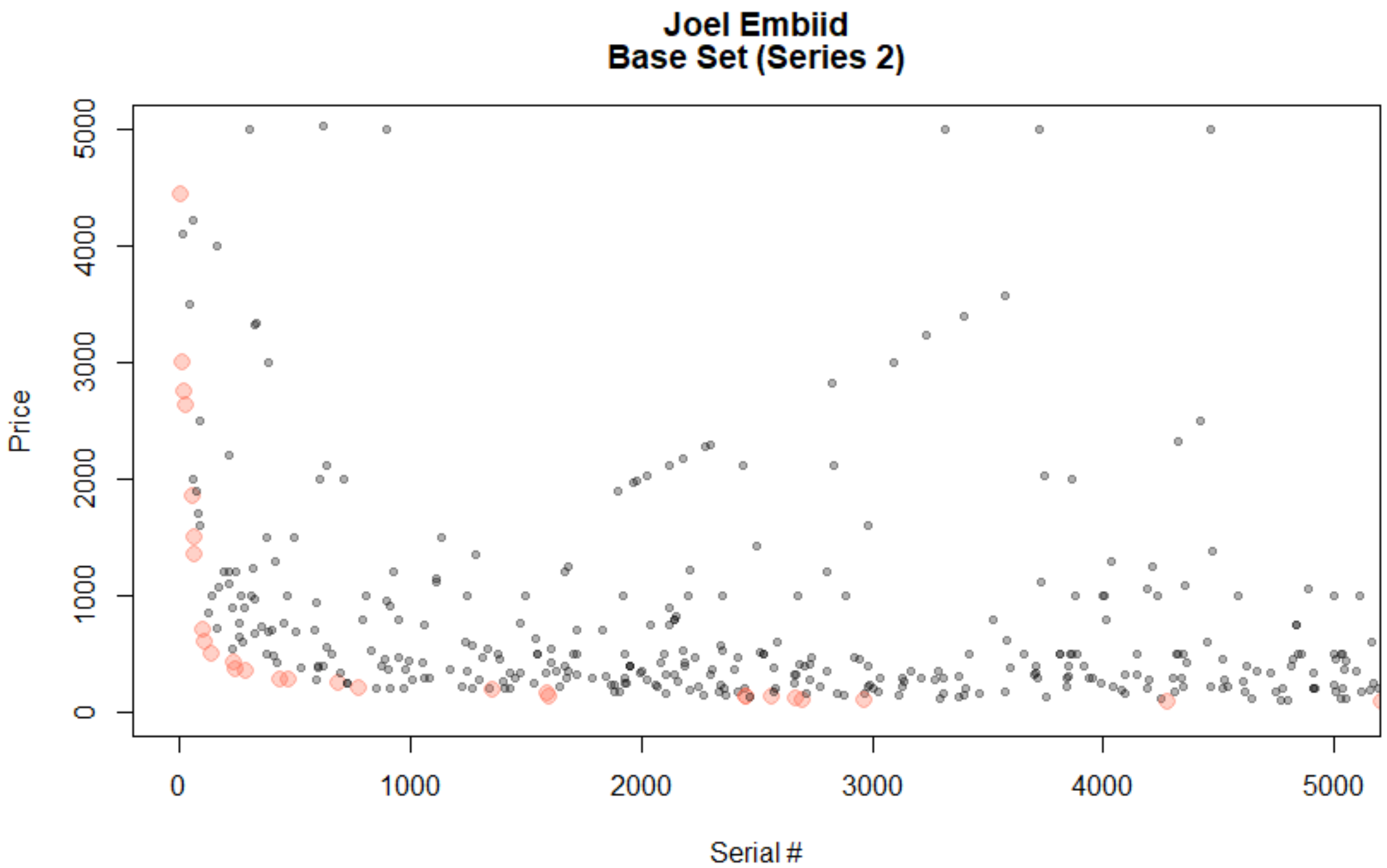
Step 1

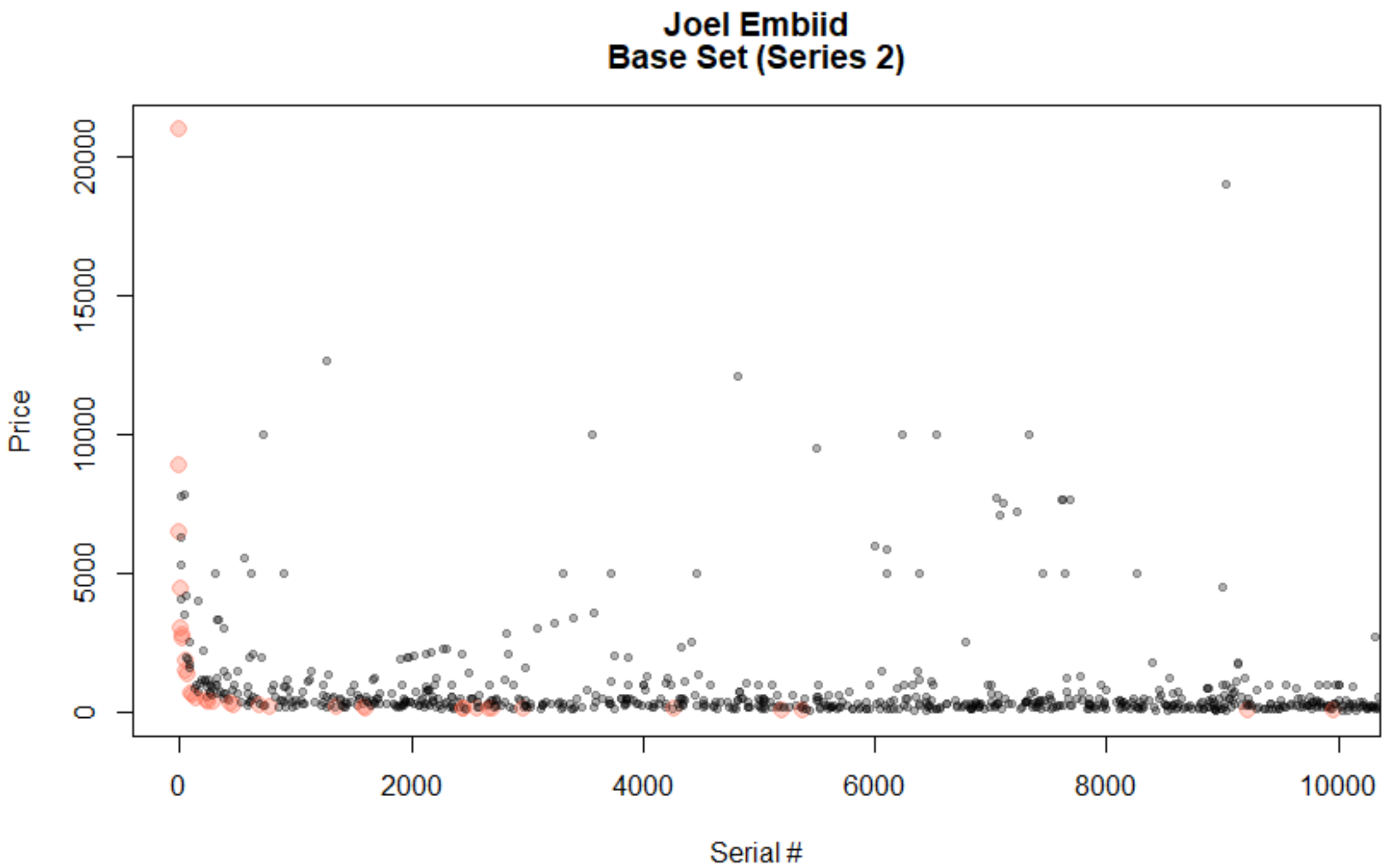
Never buy an NFT with serial number *s* for price *p*, if there is a serial number *s*-*m* for price *p*-*n*, where m, n ≥ 0.

Example: You would not buy serial number 1400 for $10 if serial number 1200 is available for $10.

- Would you buy it for $11, though?


Joel Embiid
Base Set (Series 2)
Price
0
1000
2000
3000
4000
5000
Serial #
0
1000
2000
3000
4000
5000

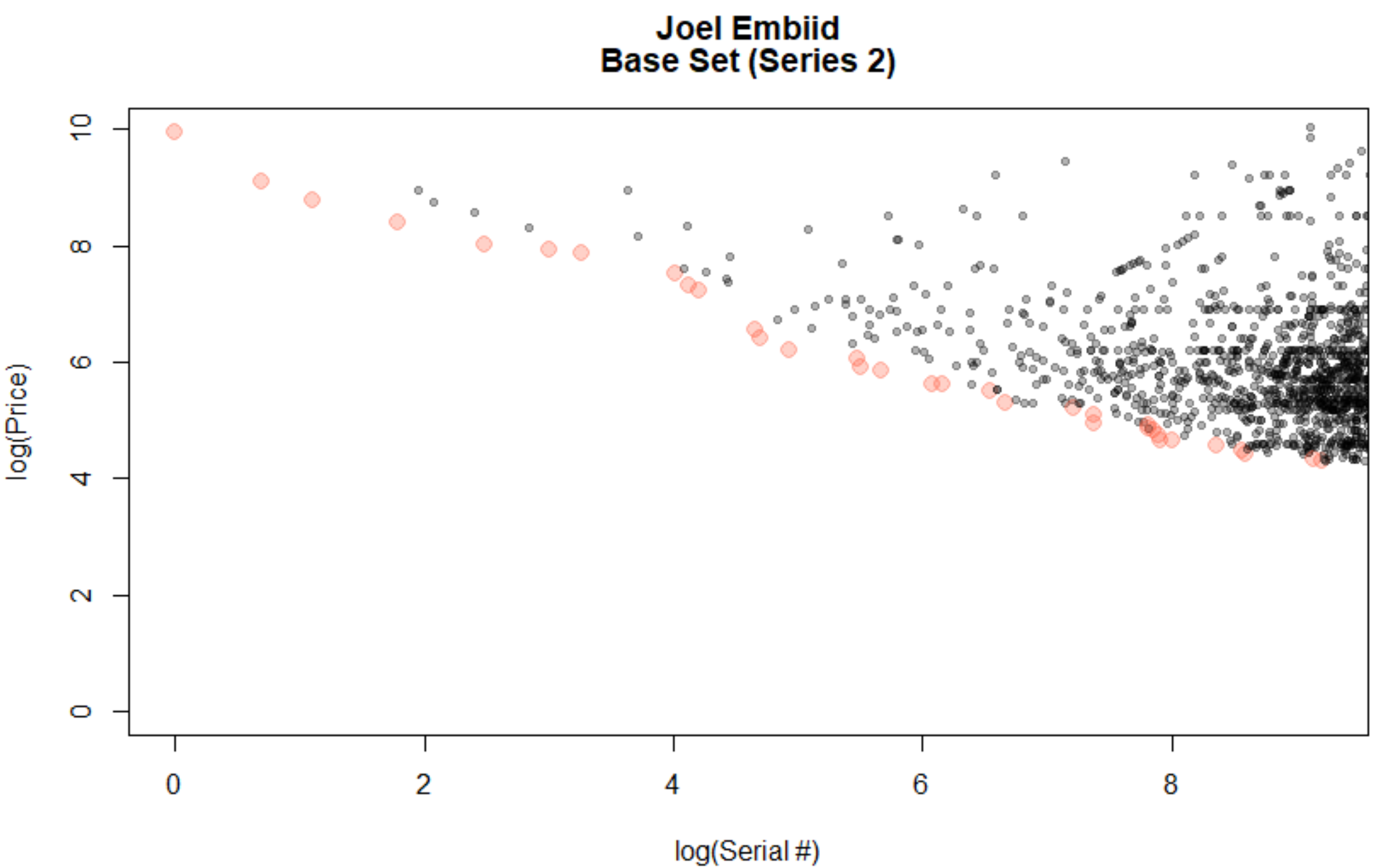

Joel Embiid
Base Set (Series 2)
Price
0
1000
2000
3000
4000
5000
Serial #
0
1000
2000
3000
4000
5000


Joel Embiid
Base Set (Series 2)
Price
0
5000
10000
15000
20000
0
2000
4000
6000
8000
10000
Serial #

Step 2

Apply a transformation to linearize the data.

- Use logarithms


Joel Embiid
Base Set (Series 2)
log(Price)
0
2
4
6
8
10
0
2
4
6
8
log(Serial #)

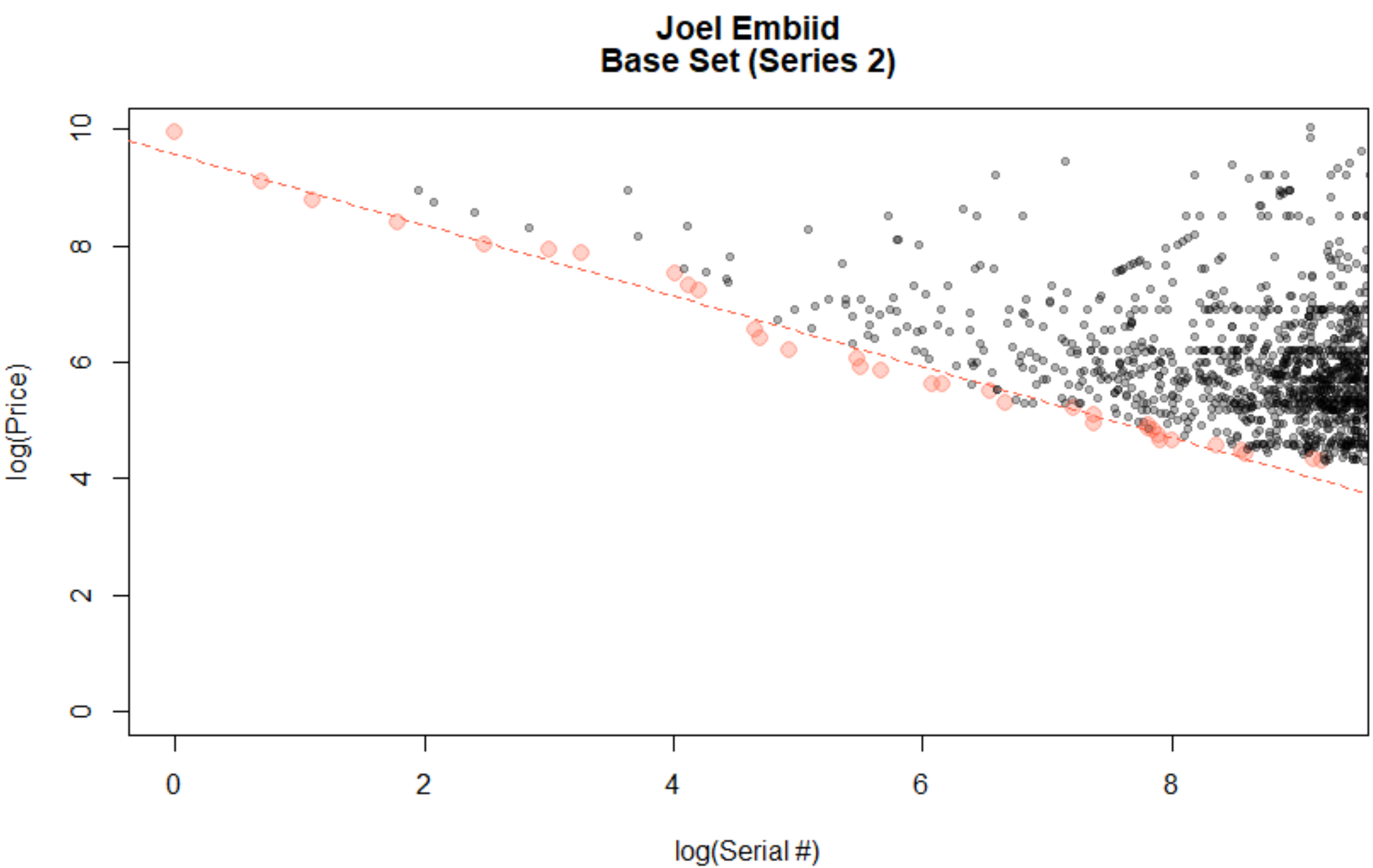
Step 3

Now we can see an equilibrium emerging, or a tradeoff between serial number and price.

Let’s estimate this equilibrium!

Regression Estimate

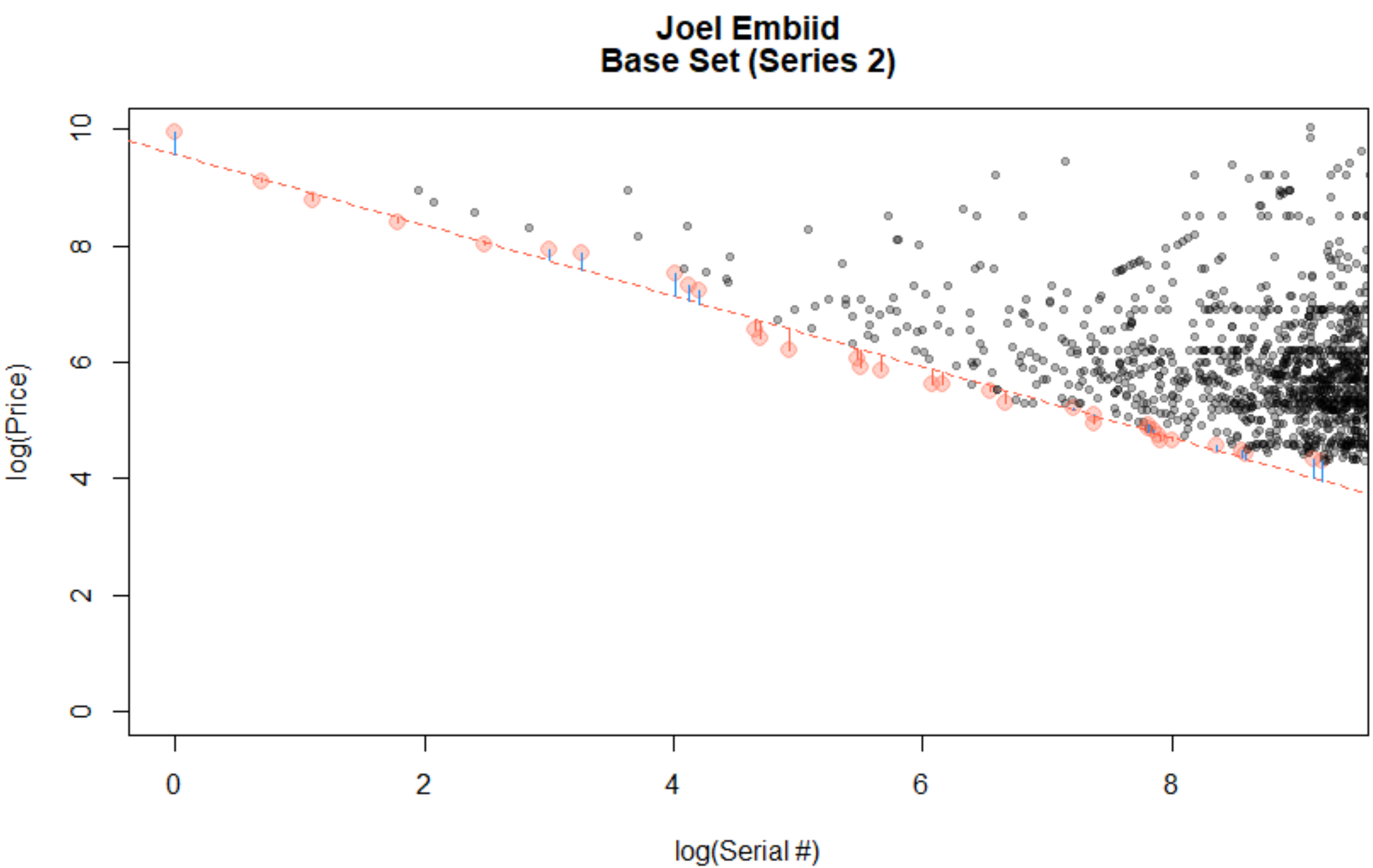
```
Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  9.56886    0.09096  105.20   <2e-16 ***
log(serial) -0.60957    0.01459  -41.78   <2e-16 ***
---

Residual standard error: 0.2134 on 32 degrees of freedom
Multiple R-squared:  0.982,   Adjusted R-squared:
0.9814
F-statistic:  1746 on 1 and 32 DF,  p-value: < 2.2e-16
```

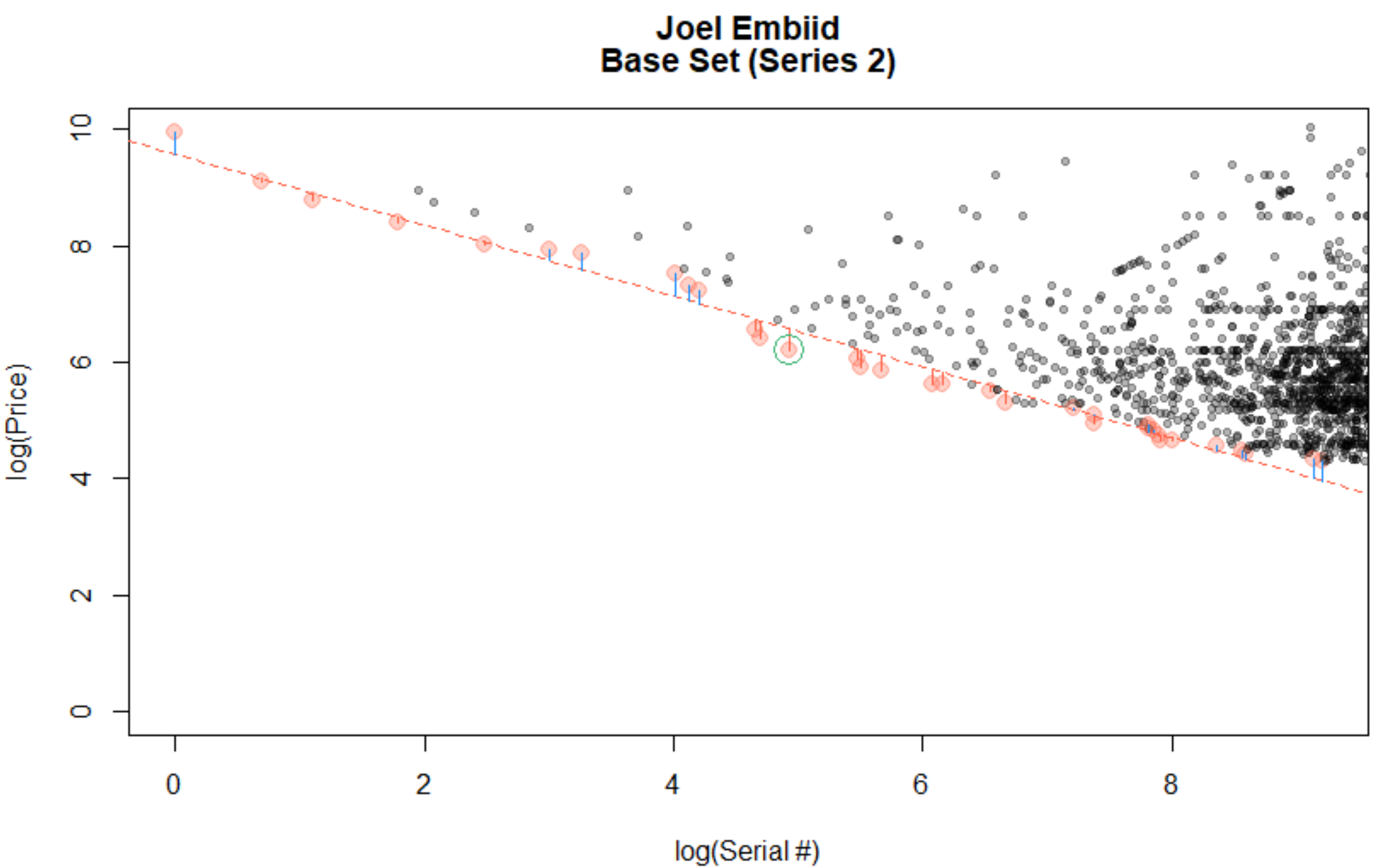

Joel Embiid
Base Set (Series 2)
log(Price)
0
2
4
6
8
10
log(Serial #)
0
2
4
6
8

Step 4

Given the equilibrium, which one of these is the “best deal”?

We are looking for the lowest price, of course, for the serial number. We can calculate this with our model’s residuals (how far away from the equilibrium).


Joel Embiid
Base Set (Series 2)
log(Price)
0
2
4
6
8
10
log(Serial #)
0
2
4
6
8


Joel Embiid
Base Set (Series 2)
log(Price)
log(Serial #)
0
2
4
6
8
10
0
2
4
6
8

Step 5

Now we know which is the best deal:

- Serial = 138; Price = 498

What should it be priced at? The equilibrium line!

- Serial = 138; Price = $710.06

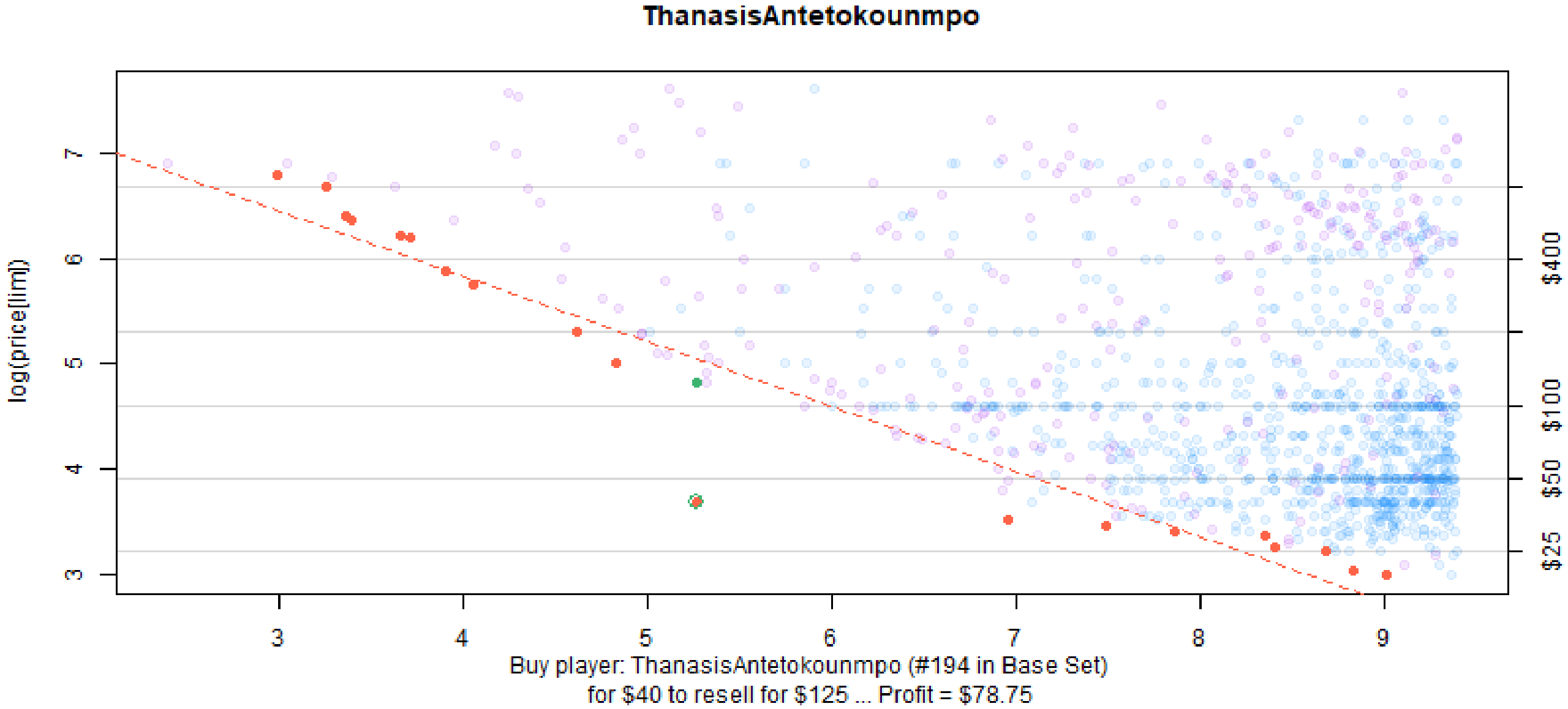
Discussion

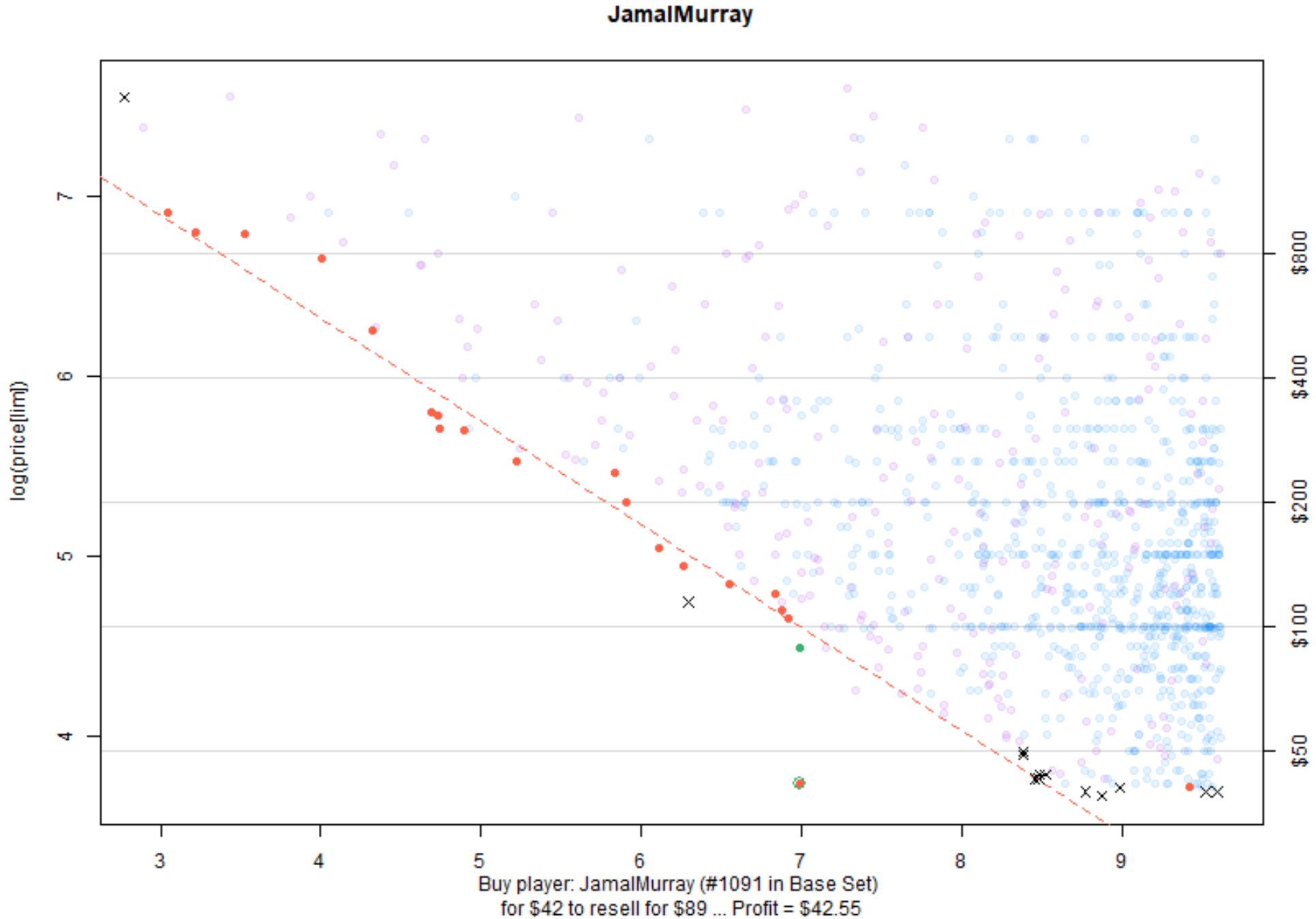
Strengths

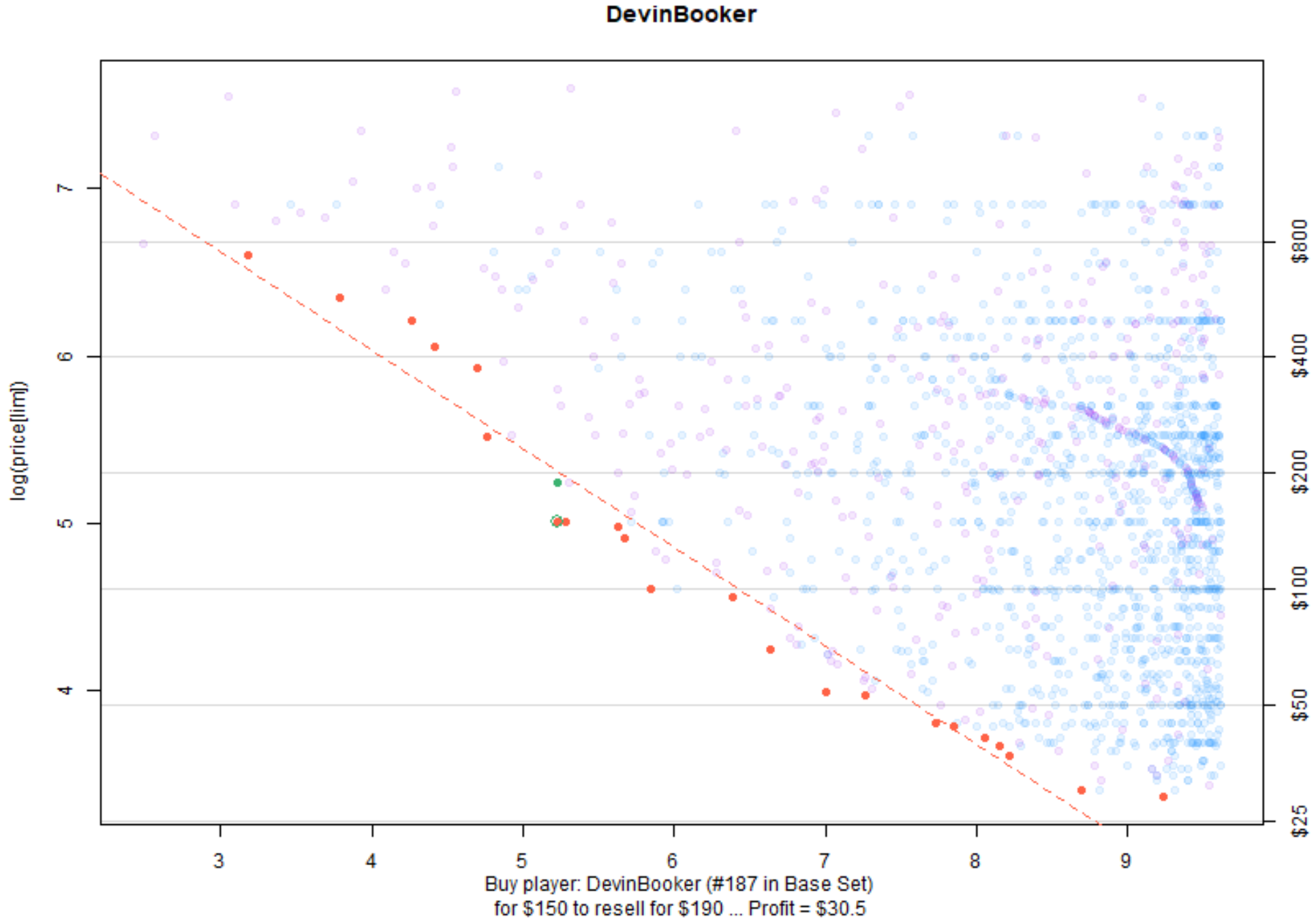
- Flexible – model is re-calibrated each time you grab data
- Scalable – model can be applied to any NFT with serial numbers
- It works!

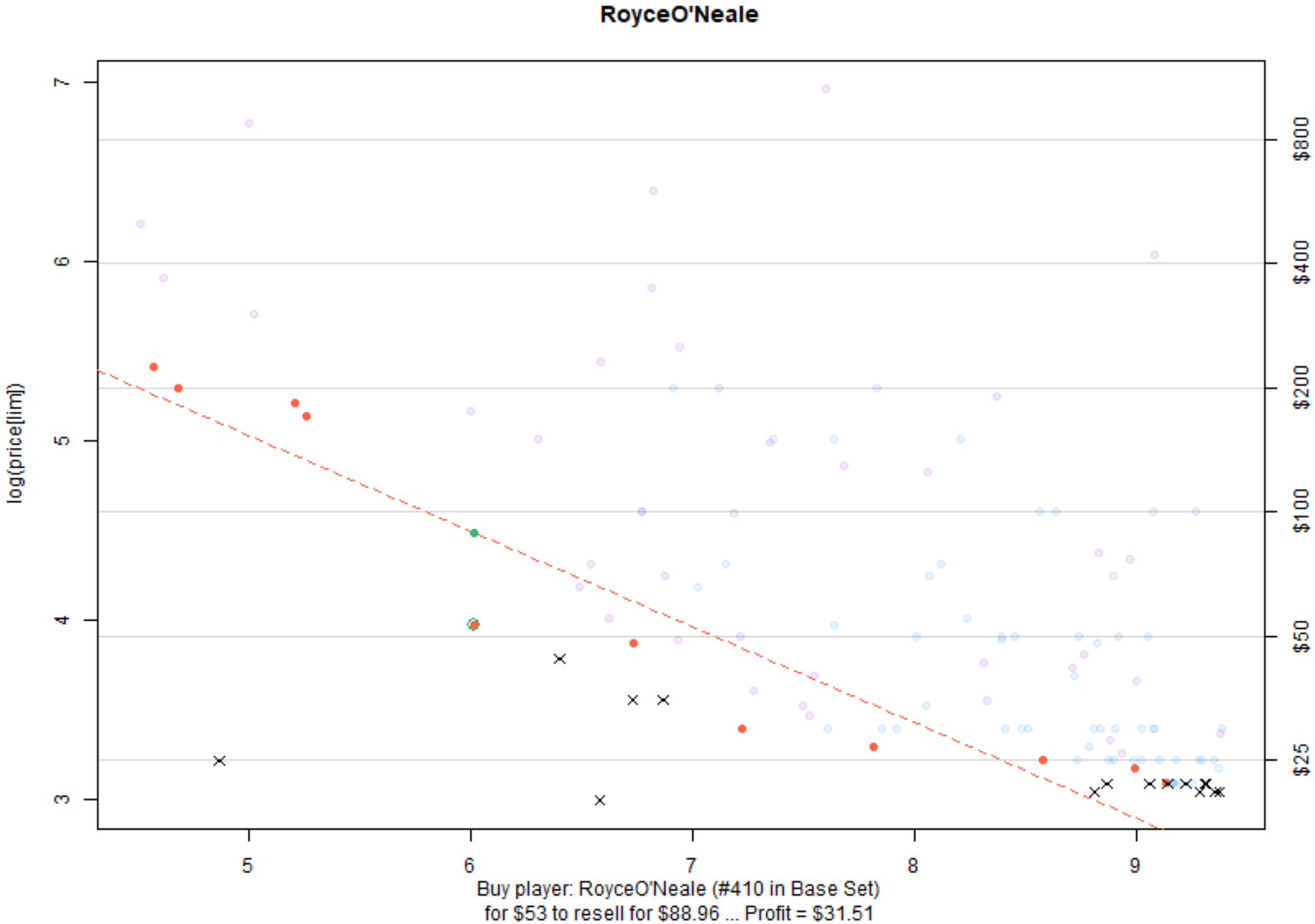
Weaknesses

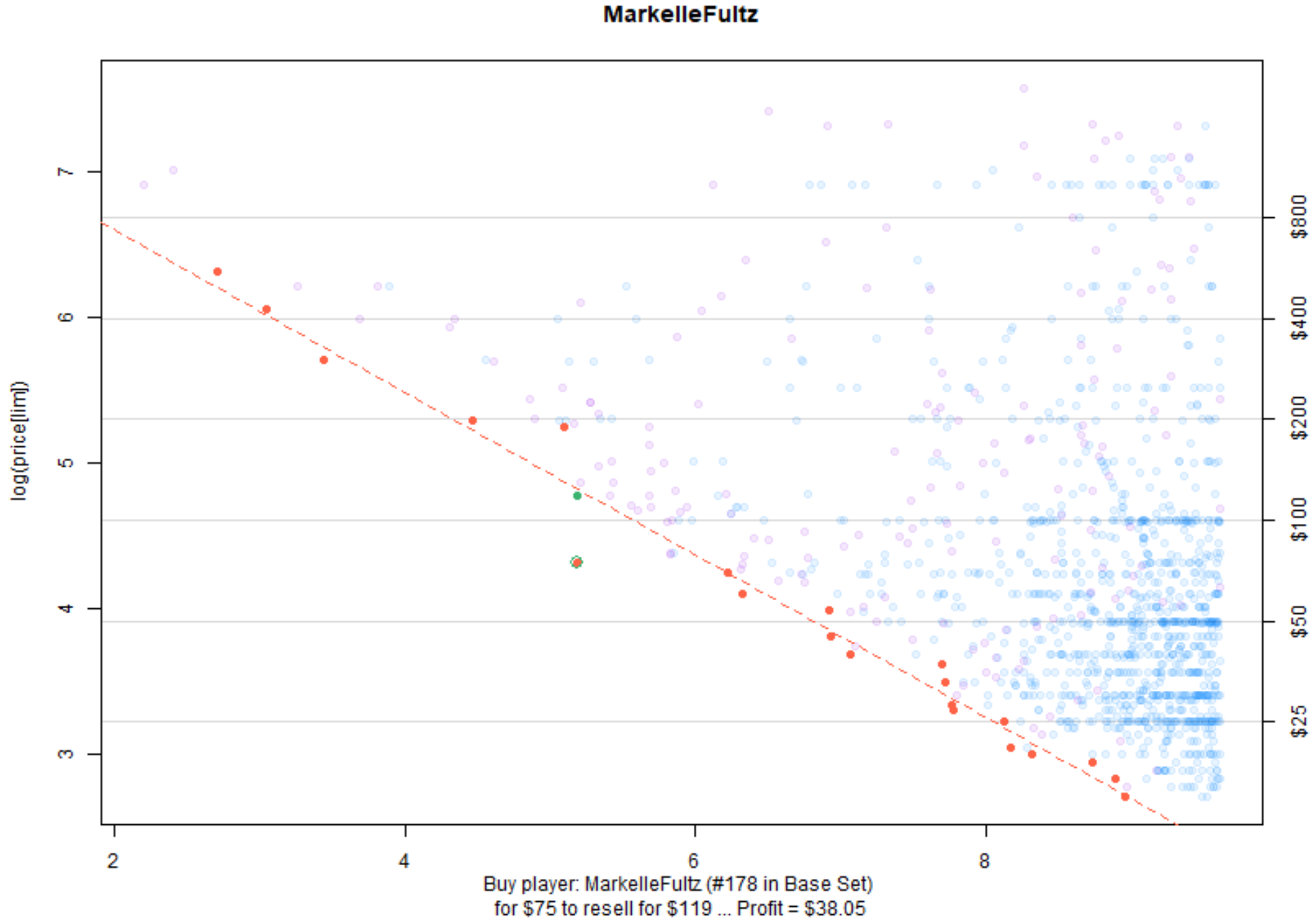
- This algo assumes liquidity
- I usually did not buy things >400
- I usually required either an $X or Y% return

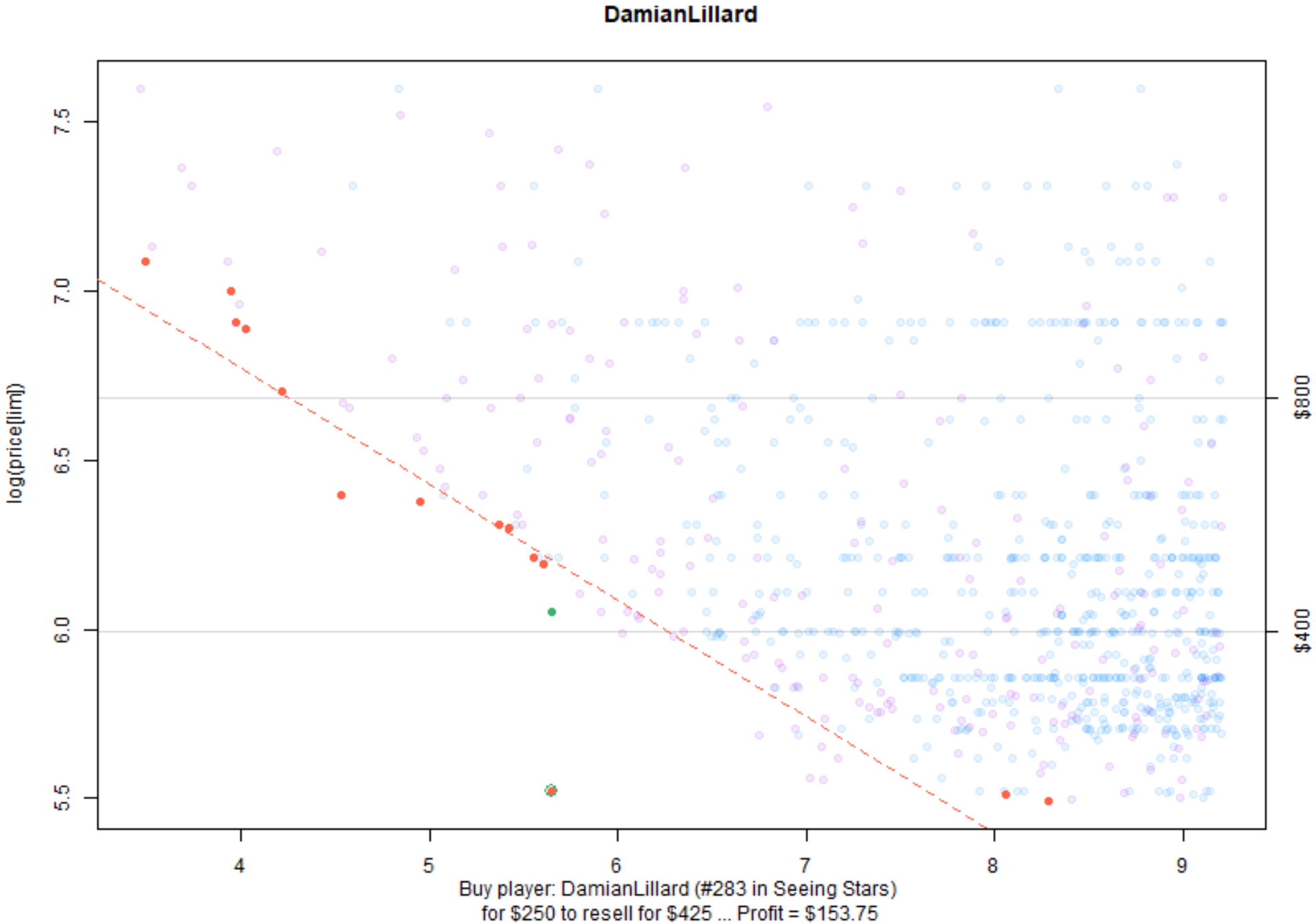

ThanasisAntetokounmpo
log(price[lim])
3
4
5
6
7
3
4
5
6
7
8
9
$25
$50
$100
$400
Buy player: ThanasisAntetokounmpo (#194 in Base Set)
for $40 to resell for $125 ... Profit = $78.75

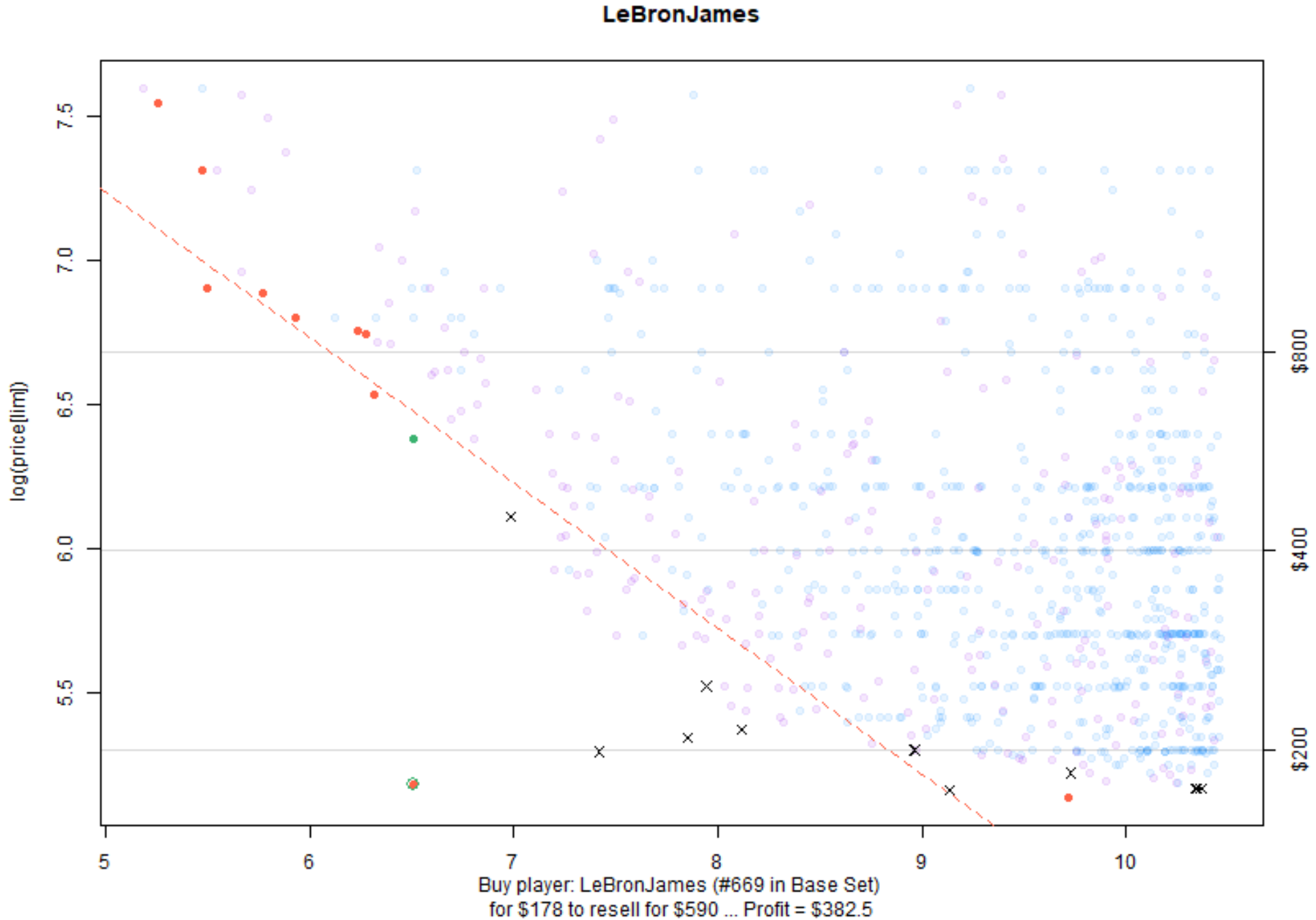

JamalMurray
log(price[lim])
4
5
6
7
3
4
5
6
7
8
9
$50
$100
$200
$400
$800
Buy player: JamalMurray (#1091 in Base Set)
for $42 to resell for $89 ... Profit = $42.55


DevinBooker
log(price[lim])
7
6
5
4
3
4
5
6
7
8
9
$800
$400
$200
$100
$50
$25
Buy player: DevinBooker (#187 in Base Set)
for $150 to resell for $190 ... Profit = $30.5


RoyceO'Neale
log(price[lim])
3
4
5
6
7
$25
$50
$100
$200
$400
$800
5
6
7
8
9
Buy player: RoyceO'Neale (#410 in Base Set)
for $53 to resell for $88.96 ... Profit = $31.51

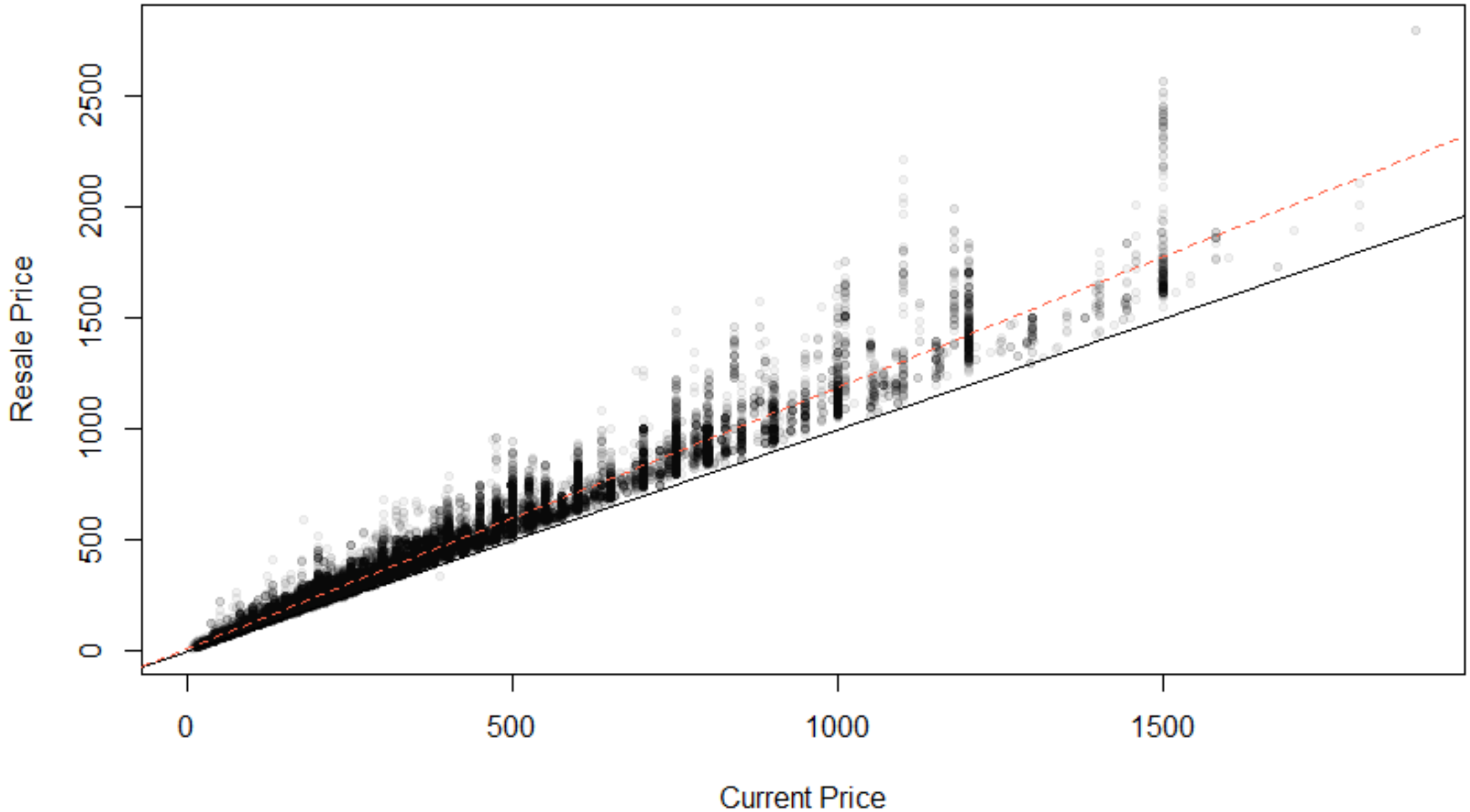

MarkelleFultz
log(price[lim])
3
4
5
6
7
$25
$50
$100
$200
$400
$800
2
4
6
8
Buy player: MarkelleFultz (#178 in Base Set)
for $75 to resell for $119 ... Profit = $38.05


DamianLillard
log(price[lim])
7.5
7.0
6.5
6.0
5.5
$800
$400
4
5
6
7
8
9
Buy player: DamianLillard (#283 in Seeing Stars)
for $250 to resell for $425 ... Profit = $153.75


LeBronJames
log(price[lim])
7.5
7.0
6.5
6.0
5.5
$800
$400
$200
5
6
7
8
9
10
Buy player: LeBronJames (#669 in Base Set)
for $178 to resell for $590 ... Profit = $382.5

Model Summary

- First buy: 2/25/2021
- Last buy: 3/24/2021


Resale Price
0
500
1000
1500
2000
2500
0
500
1000
1500
Current Price

Average Model Returns

```
Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 5.005149   0.452009   11.07   <2e-16 ***
Price       1.178704   0.001031 1143.54   <2e-16 ***
---

Residual standard error: 55.15 on 42778 degrees of
freedom
Multiple R-squared:  0.9683,  Adjusted R-squared:
0.9683
F-statistic: 1.308e+06 on 1 and 42778 DF,  p-value: <
2.2e-16
```